Working life and social relationships in old age

Inauguraldissertation

zur

Erlangung des Doktorgrades

der

Wirtschafts- und Sozialwissenschaftlichen Fakultät

der

Universität zu Köln

Jahr der Promotion

2024

vorgelegt

von

Wiebke Schmitz

aus

Oberhausen

Referent*in: Prof. Dr. Karsten Hank, Universität zu Köln

Korreferent*in: Prof.in Dr. Lea Ellwardt, Universität zu Köln

Tag der Promotion: 18.06.24

Danksagung

Es war eine verrückte Zeit und obwohl es auch sehr viele Hindernisse gab, hatte ich trotzdem das Glück, mich auf die Unterstützung von ein paar ausschlaggebenden Personen verlassen zu können. Mein besonderer Dank gilt deswegen ohne große Worte Karsten Hank und Lea Ellwardt. Ohne Euch hätte ich es nicht geschafft. Zudem danke ich Laura Naegele und Frerich Frerichs. Ihr habt mir so viel mitgegeben. Vielen Dank an meine „PhD-Gefährten“, dass Ihr von Anfang bis zum Ende für mich da wart. Ich glaube ohne Euch wäre ich auch verrückt geworden. Dazu gehören insbesondere: Julia Reinhard, Kathrin Lämmermann und Annegret Gawron. Ich danke meinen ehemaligen und aktuellen Kolleginnen und Kollegen bei ceres, der Uni Vechta, bei EIWO/in Norrköping, am ISS und beim BIBB, dass ich so viel Erfahrung mitnehmen durfte. Zuletzt, aber nicht weniger wichtig, wäre das ohne die Unterstützung von Familie und Freunden nicht möglich gewesen.

Contents

1. Introduction

1.1 Challenges of aging societies across different life stages and domains

European societies are experiencing both aging and population decline simultaneously. The demographic shift, characterized by falling birth rates and increasing longevity, is transforming societies. The notable extension of the phase of life in old age is leading to rising pension and care costs and thus questioning whether social welfare systems can adequately meet the evolving needs and demands of an aging population. The working-age population is expected to decrease by 15.5% from 2019 to 2070 (European Commission 2021). Furthermore, the proportion of the number of people aged 65 and older in relation to those aged 20-64 years, is forecasted to rise from 34% in 2019 to 59% by 2070. Thus, from 2019 to 2070, there is a projected notable increase in the share of individuals aged 65 and older within the European population, rising from 20% to 30%. At the same time, the share of those aged 80 and over is even anticipated to double, increasing from 6% to 13% (Eurostat 2020).

So far, the transition into old age has typically been linked with entering retirement, seen as a form of earned leisure after individuals have contributed to society through continuous employment throughout their life course (Kohli 1997). However, chronological starting points of entering old age stages as part of an institutionalized life course are increasingly questioned (Motel-Klingebiel et al. 2013, Naegele and Walker 2021). Particularly because reaching old age and experiencing it in good health is dependent for example upon one's social status, social resources, past life course events, and gender (Ellwardt et al. 2015, Hoven et al. 2018, Himmelreicher et al. 2008). Furthermore, the retirement age, and consequently, the onset of the "old age" phase, is progressively being raised by governments to increase workforce participation (Crossdale et al. 2022). Therefore, the institutionalized life course and the onset of "old age," and consequently, one's earned leisure time, may become increasingly blurred for future societies. This could also be attributed, for instance, to the pluralization of living arrangements (e.g. living apart together, divorce, childlessness) (Wagner and Valdés Cifuentes 2014) and shifting social norms, such as the declining willingness of daughters to provide care for their parents (Hess et al. 2023). Particularly concerning the growing fragility of the intergenerational contract within the pension system, the societal role of older individuals in society may need to be reconsidered (Backes and Clemens 2013). Policymakers are already

promoting active aging which is generally understood as supporting individuals to maintain autonomy as they age and, if feasible, to enable them to make meaningful contributions to the society (Foster and Walker 2021, European Commission 2018).

As a consequence of these developments, European societies must boost older workers' workforce participation to bolster the supply of skilled labor and address the challenges facing social security systems amid their aging populations (Motel-Klingebiel and Naegele 2022). On the other hand, the increasing proportion of the oldest-old, aged 80 years and older, poses challenges for societies, not only in terms of healthcare provision and costs but also in structuring this newly acquired life phase for example concerning the demands and needs of the oldest-old (Kaspar et al. 2023).

First, it's crucial to provide knowledge on how older workers can be more effectively integrated into the workforce. Particularly concerning disadvantaged groups such as older women, who typically shoulder the lion's share of care work (e.g. grandchildren, and older relatives). In particular, during the recent Covid-19 healthcare crisis, older women had to take on an even larger share of caregiving responsibilities (Schmitz et al. 2022). This was often due to the closure of childcare facilities and the unavailability of professional care services. As a consequence, women more frequently have to give up their workforce participation compared to older men (Moehring et al. 2021, Zamberlan et al. 2021, Brugiavini et al. 2023).

Secondly, understanding the demands and needs (e.g. social resources) of those in very old age as they navigate their final life stage is essential to inform policymakers, particularly in the development and planning of healthcare services. This is increasingly important because the oldest-old are more likely to experience significant life events such as widowhood, loss of same-aged relatives and friends, decline in health, and transitioning into a care facility (Wrzus et al. 2013, Kaspar et al. 2023). These life course events may decrease their social support network, also described as their social safety net (Ellwardt 2022). This is problematic because particularly due to declining health in older age, their need for social support may be heightened (Zimmermann et al. 2023).

In this dissertation, I am focusing on two domains separately within two different life stages/age groups: (1) *working life* and (2) *social relationships*. In the *first domain*, I examine the gendered career trajectories of older workers aged 50 years and older in different national contexts and how employment participation is associated with earlier career decisions due to family planning, such as workforce exit in earlier life because of childcare responsibilities (Chapter 2). Furthermore, I examine the extent to which various virus suppression policy

measures (e.g. stay-at-home order, closure of childcare facilities, etc.) may have contributed to workforce losses among older workers, with a particular focus on gender differences (Chapter 3).

In the *second domain* of this dissertation, I concentrate on the social embeddedness of individuals in their last life stage at the age of 80 years and over. In doing so, I investigate how the oldest-old individuals without a partner or those living apart from their partner (e.g. residing in separate households due to moving into a care facility) may adapt their social relationships to meet their social needs, in comparison to those in a partnership. Additionally, I examine which characteristics of social relationships (e.g. type and size) are perceived as most fulfilling for the oldest-old in terms of alleviating loneliness (Chapter 4).

Having now very briefly outlined the overall starting point and scope of this dissertation, the remainder of this first chapter is divided further into the two domains presented above. For each domain, I will discuss in more depth their central concepts, theories, and evidence by giving an overview of the literature to establish the core research questions of this dissertation and to clarify their importance. Following that, I will briefly summarize the three papers. Finally, I will offer a conclusion and discuss the political implications, intertwining both domains again to provide a comprehensive synthesis to wrap up this dissertation.

1.2 First domain: gendered late working life from a life course perspective

Late working life is understood as the workforce participation of older workers aged 50 years and older. So far, many European societies are gradually raising retirement age to encourage older workers to remain in the workforce. For example, in Germany, the Retirement Age Adjustment Act of 2007 initiated a stepwise increase in the retirement age from 65 to 67, which began in 2012 (Crossdale et al. 2022). This measure aims to bolster labor supply and strengthen the pension system's sustainability. An undesirable side effect of this policy measure is the exclusion of disadvantaged groups. Older workers in poorer health, for example, due to physically demanding and low-paying jobs throughout their lives, will have difficulties to continue working until the heightened retirement age (Hess et al. 2021, Mäcken 2019). Particularly women who shoulder the majority of unpaid caregiving responsibilities for (grand)children or older relatives throughout their life will face increasing difficulties to remain in the workforce (Wahrendorf et al. 2018).

Prolonging working lives depend on older workers being healthy enough, experienced, and also available in terms of not having to undertake the majority of unpaid care work. Policymakers and researchers often overlook path dependencies of earlier career decisions, such as those influenced by earlier caregiving obligations, which can subsequently determine future employment opportunities due to decreased work experience. Bluntly raising retirement ages without considering employment participation within the context of individuals' life courses fails to grasp the complexity of career trajectories through a *life course perspective* (Crossdale et al. 2022, Elder et al. 2003). The life course perspective is not only considering fixed outcomes such as retirement but it also takes the dynamic of work courses into account (Aisenbrey and Fasang 2010). It tracks the journey of individuals from infancy to old age, encompassing a series of diverse activities and events that occur throughout their lives (Naegele and Walker 2021). Older worker's employment participation in late working life can therefore not be seen as a static event (e.g. full-time employed) but rather as a status embedded in a larger life course and employment trajectory.

In this dissertation, I have chosen to concentrate on gender differences in late working life for several reasons. Foremost, the stronger inclusion of women into the workforce is a highly promising strategy to bolster the overall labor supply. Additionally, understanding the origins of gendered inequalities over the life course has the potential to provide policymakers with insights into how to address these disparities, thus strengthening the workforce at much earlier stages in life (Motel-Klingebiel and Naegele 2022).

Therefore, one of the first steps of this dissertation is to gain insights into how late working life trajectories differ between women and men. *How are late work trajectories characterized among women and men?* So far, studies suggest that women's work histories are more strongly marked by disruptions, part-time work, and unpaid domestic work. Whereas men's employment career mostly consists of continuous full-time employment (Komp-Leukkunen 2019). However, the majority of studies have focused solely on static outcomes (e.g. retirement) rather than considering complete work trajectories (Hess et al. 2021, Mäcken 2019). Additionally, prior research has largely overlooked the differentiation between genders when analyzing work trajectories (Hoven et al. 2018, Wahrendorf et al. 2018).

Overall, it's generally expected that employment trajectories in most modern European countries are characterized by continuous full-time employment (Kohli 1997, Naegele and Walker 2021). However, this work-centered structure primarily applies to men. In contrast, women are still culturally and politically expected to pursue a family life course (e.g. marriage,

childbirth) and take on unpaid care duties (Möhring 2016). Overall, the breadwinner-caretaker division is still perceived as the norm, although younger generations of women are making stronger efforts to reconcile paid work and caregiving responsibilities, such as by reducing their working hours (Komp-Leukkunen 2019). Even though older women's workforce participation has heightened over the past two decades, the gendered employment gap is still severe (Crossdale et al. 2022).

Furthermore, women's discontinuous employment histories may also be rooted in their more frequent employment in lower-paid and low-quality jobs that offer less security and are easier to lay off (Moehring et al. 2021). For example, compared to men, women are more frequently employed in retail sectors as shop salespersons, in the hospitality sector as housekeeping or restaurant services workers, and within the healthcare sector as personal care workers (Bettio et al. 2009). Additionally, this gendered division of labor in paid employment made women more vulnerable during the Covid-19 Pandemic not only due to increased infection risks (e.g. healthcare sector) but particularly because of the policy measures to prevent the spread of the virus (Brugiavini et al. 2022, Moehring et al. 2021). Sectors where women are more commonly employed, compared to men, were disproportionately affected by containment measures, such as the closure of non-essential shops, cafés, and restaurants (Brugiavini et al. 2022). At the same time, the closure of childcare facilities increased the gendered burden of care (Zamberlan et al. 2021). Thus the Pandemic may have acted as an additional barrier especially among older women to remain in the workforce, and its influence may extend beyond the initial crisis to have mid- to long-term consequences for older worker's employment participation (Brugiavini et al. 2023).

1.2.1 Cumulative disadvantages: gendered burden of care and family history

In this dissertation, disadvantages refer to the gendered burden of care in earlier life and the associated risks of exclusion from the labor market in late working life. Family history is understood as past life-course events within the family such as childbirth, divorce, or cohabitation with one's partner. The reconciliation of employment and unpaid care work may be managed together with a partner ("*linked lives*") (Bengtson et al. 2016). While traditionally, the partner assumes the role of the breadwinner, women are often expected to take on the role of the caregiver (Pinho and Gaunt 2021). This research work applies a long-term risk perspective to understand gender inequalities in late working life participation rooted in earlier

family history. In doing so, one central assumption in this dissertation is drawn from the *theory of cumulative (dis)advantages*, which posits that adversities experienced earlier in life can escalate into more significant disadvantages throughout one's life (Dannefer 2003). It's assumed that privileged groups will have more opportunities throughout the life course, whereas disadvantaged groups may face decreased chances in the future (Holman and Walker 2021). Differences in employment participation between genders may deepen over the life course. Hence, early childcare responsibilities may pose significant employment risks for women in late working life by reducing their opportunities to extend their participation in the workforce (Wahrendorf et al. 2018). For example, women may have chosen to exit employment earlier in life due to childbirth. Consequently, this gap in employment may result in reduced work experiences, making it more challenging for them to secure reemployment opportunities (Murdock et al. 2021). Men may be less likely affected by childcare responsibilities because they are traditonally expected to take on the breadwinner role. Up until now, prior research has mainly focused on the short-term effects of unpaid care work for women's and men's employment, showing that women with childcare responsibilities are more likely to work part-time or in unpaid domestic work (Lalive and Zweimüller 2009, Madero-Cabib and Fasang 2016, Lacey et al. 2016). Men, on the other hand, continue to work full-time and benefit from increased work experience (Wahrendorf et al. 2018). Taken together, the second step of this dissertation aims to examine the differential enduring impact of earlier childcare responsibilities on women's and men's participation in the workforce during late working life: *How are earlier family events related to women's and men's workforce participation during late working life?*

1.2.2 Country differences: the role of welfare regimes and the importance of life course policies

Social policy regimes play a crucial role in mitigating the disadvantages faced by older workers, particularly when individuals may not be able to address these challenges on their own due to their limited resources (Naegele and Walker 2021). However, these social policies differ considerably between European countries. Therefore it's expected that disadvantages such as the gendered burden of care are less pronounced in those countries with more extensive social welfare systems (Crossdale et al. 2022). Life course policies aim to reduce social inequalities in earlier life, for example, those caused by life course events such as childbirth leading to the decision to exit the workforce or to reduce one's working hours (Geissler 2007, Naegele and Walker 2021). So far, countries differ enormously in their social welfare provision but none of

them has implemented any specific life course policies yet (Crossdale et al. 2022, Foster and Walker 2021, Möhring 2016). This is unfortunate because to ensure the health, productivity, and availability of future older populations, it's crucial to implement preventative interventions across the entire lifespan rather than merely addressing issues once they arise.

Therefore, in the third step of this dissertation, I aim to demonstrate the significance of social policies in addressing the escalating burden of inequalities across the life span, illustrated through earlier childcare responsibilities and its consequences for late working life participation among women and men. *How do the caregiving burden in earlier life and its consequences for late working life participation differ across various national contexts among women and men?* Previous research demonstrated that the gendered burden of care differs significantly across countries and that especially in Nordic countries these gender inequalities are lower (Kuitto and Helmdag 2021, Ulrich Mayer 2004, Fasang 2010). However, prior studies only partly examined country differences by focusing on the comparison of single countries. This dissertation aims to close this research gap by including a broad comparison of different types of European countries. To facilitate the comparison of different national contexts, I employ a comparative framework that categorizes European countries into five types of welfare regimes: (1) *social democratic*, (2) *liberal*, (3) *conservative*, (4) *southern*, and (5) *post-socialist regimes*. The five types of welfare regimes differ in their influence on gendered late working life and will be summarized and discussed in more detail within the study in Chapter 2. Their categorization is based on three welfare dimensions (Esping-Andersen 1989): Decommodification involves key social security programs like unemployment insurance and public childcare. Social stratification determines the degree to which the welfare state influences the hierarchical order of individuals for example based on their income, occupation, and education. Lastly, the blend of private and public family welfare relates to the roles of the state, the family, and the market regarding welfare provision. The comparison of welfare regimes is promising to gain a more complete understanding of how various national contexts differ in their influence on gendered work courses. It's expected that the gendered burden of care is significantly less pronounced in countries that perpetuate greater gender inequality, such as those, where welfare provision (e.g. childcare) is not primarily shouldered by women (Möhring 2016, Naegele and Walker 2021, Anttonen and Sipilä 1996). Thus there may be a strong North-South divide in Europe. For example in social democratic regimes such as Sweden, women have more access to childcare and their participation in late working life is much higher compared to other European countries (Crossdale et al. 2022). Conversely, particularly in conservative (e.g. Germany) and southern regimes (e.g. Spain), there is a substantial reliance on women to provide unpaid care work

(Worts et al. 2016). Consequently, women may bear a heavier impact from earlier caregiving responsibilities on their participation in the workforce during their later years.

Moreover, older workers in European countries that provided more extensive welfare provisions during the Covid-19 Pandemic (e.g. earnings replacements like short-time work benefits and job retention schemes) may have experienced fewer adverse effects on their employment participation (Moehring et al. 2021). European countries differed immensely in their policy responses during the Covid-19 Pandemic, particularly regarding containment measures aimed at preventing the spread of the virus (ECDC 2022). For instance, while Sweden mostly refrained from implementing stringent containment measures and imposed only minimal mandatory restrictions, other countries, notably Portugal, France, and Austria, experienced prolonged periods of lockdowns and closures, particularly affecting businesses such as cafés and restaurants. The consequences of containment measures for older worker's employment participation will be further discussed in the next section.

1.2.3 Labor market shocks: unemployment scarring during the Covid-19 Pandemic

Economic crises such as the Great Recession or more recently the Covid-19 Pandemic have the potential to result in increased workforce losses (Brugiavini et al. 2023). Indeed, this situation is problematic as it may further burden the already fragile pension and long-term care systems, thereby impeding the aforementioned efforts to integrate older workers into the workforce and to extend late working life. One of the central questions in the last section of the first domain of this dissertation is whether the Covid-19 Pandemic may have lasting effects on the workforce participation of older workers. For instance, this may be particularly relevant among those who are more vulnerable due to precarious employment. If so, policymakers may still need to address the repercussions of the Pandemic to strengthen the future workforce. Until now, prior research has focused primarily on the short-term consequences of the Pandemic, neglecting the potential long-lasting effects on the older workforce (Brugiavini et al. 2022, Moehring et al. 2021).

While older workers are less prone to job loss due to their seniority compared to younger workers, once they do lose their jobs, they are more likely to experience long-term unemployment or may eventually decide to quit the workforce completely by retiring earlier (Brugiavini et al. 2023, Bui et al. 2020). The challenges associated with re-entering the labor

market after job loss may worsen with prolonged unemployment. According to the concept of *unemployment scarring*, prolonged periods of unemployment can lead to lasting negative effects such as diminished work experience, deterioration of skills, decreased motivation, and poorer health (Filomena 2023). This becomes particularly apparent due to the heightened digitization and prevalence of teleworking conditions during the Pandemic (König and Seifert 2022). Additionally, age discrimination has also intensified during the Pandemic, further impeding the employment prospects of older workers (Ayalon et al. 2021).

The Covid-19 Pandemic was distinct from previous labor market shocks due to the policy measures put in place to curb the spread of the virus. Containment measures have not only hampered the reconciliation of employment and unpaid care responsibilities but also affected older worker's employment directly by closing businesses such as non-essential shops, restaurants, and cafés. Prior research indicates that older workers in countries with stricter and prolonged containment measures are still significantly impacted by unemployment or inactivity 1.5 years after the onset of the Pandemic (Brugiavini et al. 2023). Especially the closure of businesses, particularly non-essential shops where a significant portion of workers are employed, likely had the most detrimental impact on employment participation (OECD 2020). Furthermore, the closure of schools and childcare facilities may have heightened the caregiving burden, particularly among women, potentially leading to their exit from the workforce (Zamberlan et al. 2021, Fervers et al. 2023). Unfortunately, there is a lack of knowledge regarding how different containment measures vary in their impact on employment. Researchers have not thoroughly explored the diverse effects of containment measures yet.

Although governments implemented policies such as job retention schemes and short-time work benefits to mitigate the adverse effects of the Pandemic, disadvantaged groups who were already on the periphery of the labor market may not have benefited from them. For example, older workers in precarious jobs are often not eligible for such benefits and are more vulnerable to layoffs (Moehring et al. 2021). Prior research indicates that such pre-existing inequalities were exacerbated during the Covid-19 Pandemic. Moreover, while the Great Recession, often termed the "Mancession," primarily impacted jobs in sectors with a larger share of men (e.g., manufacturing, construction), the Covid-19 Pandemic, already labeled as a "Shecession," predominantly affected sectors where women are more commonly employed (e.g., retail, hospitality) (Moehring et al. 2021). Additionally, the heightened demand for care during the Covid-19 Pandemic, particularly due to closures of childcare facilities, may also have caused cumulative disadvantages. Thus, women likely decided to exit the workforce completely to take on caregiving responsibilities during the Pandemic which in turn may

exacerbate women's workforce participation in the future in contrast to men. Yet, there is still a gap in research regarding the potential gendered consequences of various containment measures on the older workforce.

Taken together, in the last part of the first domain my objective is to address how the Covid-19 Pandemic, along with its diverse containment measures, may have resulted in lasting gendered impacts on the older workforce 1.5 years after the Pandemic began. *Which containment measures impact late-working life over the mid-term, and how does this association differ between men and women?*

1.3 Second domain: social relationships and loneliness in very old age

The increase in longevity has led to the emergence of a distinct new phase of life commonly referred to as the "fourth age" (Kohli 1997). The demographic of individuals aged 80 years and above represents the fastest-growing segment of the population in Europe (Eurostat 2020), posing a challenge to the pension and healthcare system. In the second domain of this dissertation, I chose to focus on the oldest-old and their social embeddedness for several reasons. Firstly, the increased life expectancy also implies that the oldest-old are more susceptible to experiencing health decline and diseases, potentially necessitating increased reliance on social support (Zimmermann et al. 2023, Kaspar et al. 2023). Additionally, emerging trends such as the diminishing availability of daughters willing to provide care for their parents and the rising number of childless future generations among the oldest-old suggest that the social support infrastructure may become increasingly fragile (Hess et al. 2023, Wagner and Valdés Cifuentes 2014). Furthermore, due to these social changes, there is already an anticipation that loneliness may increasingly emerge as a widespread issue (Ellwardt 2022). The World Health Organization declared loneliness as a "global publich health concern" (WHO 2023). Moreover, in the United Kingdom, the government even established a Ministry for Loneliness to combat the negative health consequences of loneliness (Pimlott 2018). Thus, it's crucial to understand the sources of social support in very old age, including potential backup social support sources who can step in and compensate for missing social contacts when necessary.

The oldest-old are more likely than younger age groups to have dealt with significant life course experiences such as health deterioration, widowhood, the loss of relatives and friends of the same age, and the relocation into an institutional care home (Wrzus et al. 2013, Brijoux

et al. 2021, Martikainen et al. 2008). Social relationships can offer crucial support during these life course transitions, providing assistance, comfort, and guidance, for instance. Particularly the partner is considered as the most important emotional bond and the primary source of support (Pinquart 2003, Dykstra and Jong Gierveld 2004). Social relationships are important not only due to their positive effects on the health and well-being of the oldest-old but also because they can potentially enhance social participation, which in turn can promote active aging – for example through activities such as looking after grandchildren and assisting in the neighborhood or other societal initiatives (Böger et al. 2017, Pinquart and Sorensen 2001). On the other hand, dissatisfaction with one's relationships can lead to loneliness, which is detrimental to health and well-being if individuals are unable to compensate for the absence of desired relationships – such as after partner loss (Hawkley and Cacioppo 2010).

In this dissertation, the structure of social relationships among the oldest-old is described by *social networks* and the *living arrangements* with one's partner. Social networks can be described based on their functional and structural characteristics. Functional aspects refer to the quantity and quality of social support available, while structural characteristics include quantitative indicators like the size and diversity of social relationships (Ellwardt and Hank 2019). In this research, living arrangements with one's partner are categorized based on whether they share a household, specifically identifying whether the oldest-old are in a *coresidential relationship* or a *living-apart-together (LAT) partnership* (Mauritz and Wagner 2021).

The satisfaction with one's social connectedness is often indicated by subjectively perceived loneliness. Emotional loneliness refers to the subjectively perceived missing of close emotional relationships, such as with a partner, while social loneliness pertains to the disparity between the desired and actual size and diversity of one's social relationships (Gierveld and van Tilburg 2006).

Although social embeddedness is essential for the maintenance of the health and well-being of the oldest-old, social relationships are especially susceptible to decline due to critical life events. Previous studies have demonstrated that the size of social networks indeed tends to decrease as individuals age (Wrzus et al. 2013). However, research findings are inconclusive, with most studies primarily focused on younger age groups (Schwartz and Litwin 2018, Wrzus et al. 2013). Therefore, it is essential to gain knowledge on the social embeddedness of the oldest-old to obtain a clearer understanding of their available social resources, particularly in buffering critical life transitions. The *hierarchical compensatory model* posits that individuals offset the loss or absence of a potential social support source by intensifying their engagement with other members of their social network (Cantor 1979). Given that the oldest-old are more

prone to losing their partner compared to younger age groups, it becomes crucial for them to compensate for this loss through other social relationships (Kapelle and Monden 2024). Additionally, the oldest-old are likely found in LAT partnerships (Mauritz and Wagner 2021). This arrangement may occur when one partner moves into an institutional care setting or due to one's decision to start a new partnership (e.g. after widowhood or divorce) without sharing the same household. It's important to distinguish between coresidential and LAT partnerships. Coresidential partnerships may provide the advantage of immediate access to support. In comparison, individuals in LAT partnerships might be more inclined to seek alternative social contacts for social support if their LAT partner is unavailable in times of need (Mauritz and Wagner 2021).

Therefore, one of the main research questions addressed in the second domain of this dissertation is the extent of resourcefulness within the social networks of the oldest-old, particularly concerning their living arrangements with partners. It aims to investigate whether individuals without a partner and those in LAT partnerships might compensate for the lack of social support by maintaining a broader social network. *Do the oldest-old who lack a partner, as well as those in LAT relationships, seek to address the absence of social support by cultivating a wider and more varied social network compared to those in coresidential partnerships?*

Moreover, it is largely unknown which characteristics of social relationships (e.g., social network size and relationship types such as partner, friends, and siblings) as well as the living arrangements with one's partner are differentially fulfilling for the oldest-old in terms of their association with loneliness. As loneliness is strongly linked to poorer health, it's crucial to gain knowledge on which relationships may buffer those feelings. Up until now, most prior research has only examined single types of relationships instead of comparing various ones (Luhmann and Bücker 2019).

While having a partner is strongly linked to higher life satisfaction (Hilz and Wagner 2018, Pinquart 2003), it likely makes a difference whether individuals share a household with them or not. For instance, previous studies have shown that living alone is a risk for experiencing higher levels of loneliness (Greenfield and Russell 2011). Other bonds within the family such as those with children, grandchildren, and siblings can be a great source of social support too (Suitor et al. 2016). In compliance with the *socio-emotional selectivity theory*, as individuals age and view their remaining lifetime as restricted, they tend to prioritize a small amount of emotionally close relationships, particularly with their partners and family members and, thus, may be satisfied with only a small number of close relationships (Carstensen 1992).

However, studies have found that beyond the kin network, having friends in particular has been shown to buffer loneliness as well (Luhmann and Bücker 2019). Possessing a network of friends and acquaintances beyond one's partner and kin network, along with a larger social network size, is considered equally crucial (Ellwardt 2022). For instance, these relationships can facilitate engagement in social activities and the exchange of information. According to the *social convoy model*, a diverse social network comprising not only kin relationships but also contacts such as friends and acquaintances can be valuable sources of alternative support (Kahn and Antonucci 1980). A more heterogeneous network including friends and acquaintances may act as a resourceful backup to compensate for missing social contacts and thereby alleviate feelings of loneliness.

Finally, the last research question in the second domain aims to gain knowledge on how the size of the social network, the type of social relationships, and the living arrangement with one's partner may buffer loneliness differently. *How are the living arrangements with one's partner and the social network size and diversity related to loneliness in very old age?*

1.4 Summary of the three studies

The dissertation comprises three studies which are categorized into two domains. Table 1 provides an overview of the three research works. While the first two studies focus on late working life among older workers aged 50 years and older in Europe (first domain), the third study investigates social relationships among the oldest-old aged 80 years and older in Germany, North-Rhine Westphalia (second domain).

The first study in Chapter 2 entitled *Gendered late working life trajectories, family history and welfare regimes: evidence from SHARELIFE* investigates how earlier family events are related late working life and how this association differs between various welfare regimes in Europe. As already discussed, concerning the fragility of the pension system and the shortage of skilled workers, it's crucial to understand women's exclusion risks in comparison to men because the increased integration of women into the labor market holds promise for strengthening the overall workforce. In doing so, this article applies a life course perspective by examining the full late working life trajectories of older workers and how these are differently related to earlier family history (e.g. childbirth) depending on the welfare regime. Prior research has largely neglected to examine the gendered long-term effects of earlier career decisions based on family history, such as exiting from the workforce to care for one's children.

Table 1. Overview of the three studies in this dissertation

	1st Study	2nd Study	3rd Study
Domain	**Working life**		**Social relationships**
Title	**Gendered late working life trajectories, family history and welfare regimes: evidence from SHARELIFE**	**Do Covid-19 Containment Measures Reshape Late Working Life in Europe in the Mid-Term? Insights from the Second SHARE Corona Survey**	**Social relationships, living arrangements and loneliness**
Age-group	50 years and older		80 years and over
Research questions	(1) Do working life trajectories in Europe differ by gender? (2) Can these trajectories be explained by family history? (3) Does the association between late working life trajectories and family history vary across welfare regimes?	(1) Which containment measures impact late-working life over the mid-term, and (2) how does this association differ between men and women?	How are (1) the living arrangements of the oldest-old related to their social embeddedness and (2) to what extent are both their living arrangements and social embeddedness associated with loneliness?
Data	Retrospective life history data from the Survey of Health, Ageing and Retirement in Europe (SHARELIFE)	Linkage of the 2nd SHARE COVID-19 Survey with country-level data from the European Centre for Disease Prevention and Control (ECDC)	Cross-sectional data from the Quality of Life and Well-Being of the Very Old in North Rhine-Westphalia (NRW80+)
Population	Europe		Germany, North-Rhine Westphalia
Interview year	2017	2021	2017
Sample of analysis	n = 10,913 women and n = 10,614 men	n = 9,186	n = 1,860
Outcome	Clusters of late working life trajectories	Employment status	Loneliness
Explanatory Variables	Family history, welfare regimes (moderator)	Containment measures, gender (moderator)	Living arrangements, social relationship types, social network size
Analytical Strategy	Sequence analysis, cluster analysis, multinomial logistic regression, moderator analysis	Multinomial logit regression, moderator analysis	χ2-tests, one-way ANOVA, ordered logit models
Results & conclusion	Family history is linked to part-time and domestic work in late working life among women; Men's late working life is largely unaffected by earlier family history; There's a North-South divide: Women's employment in late working life is barely affected by previous family obligations in nordic countries in contrast to southern and western Europe	Past measures continue to impact the employment of older workers 1.5 years after the onset of the Pandemic; Mid-term consequences of containment measures for the employment participation of older workers vary based on the type of measure employed; The closure of childcare facilities and non-essential shops has the most adverse impact on employment, particularly among women	Respondents without a partner adjusted their social networks to meet their needs; Being in a coresidential partnership and having a large social network protects the oldest-old against loneliness; People living in an LAT partnership not only had a smaller and less diverse social network but were also as lonely as those who had no partner
Publication status	Published in *European Journal of Ageing*	Under review at *Journal of European Social Policy*	Published in *Zeitschrift für Gerontologie und Geriatrie*

Moreover, a fuller understanding of how these caregiving burdens may differ depending on various welfare regimes, which also shape the opportunity structures of respondents, is still missing. Using retrospective survey data from SHARELIFE (Wave 7) including respondents aged 50 years and older, this article aims to tackle those shortcomings to explore the following research questions: Are there variations in working life trajectories between genders in Europe? Can these trajectories be understood through family history? Does the connection between late working life trajectories and family history differ across different welfare regimes?

Late working life trajectories are examined by using eight categories: (1) Full-time employed, (2) Full-time self-employed, (3) Part-time employed, (4) Part-time self-employed, (5) Domestic work, (6) Sick or disabled, (7) Unemployed or inactive and (8) Retired. *Family history* is measured by parenthood and partnership history. Parenthood history refers to the mean number of adopted and biological children individuals had between the ages of 25 and 49. Partnership history encompasses the duration individuals spent in a cohabiting partnership between the ages of 25 and 49. The *welfare regime* typology categorizes countries into five types: (1) Social democratic regime, (2) liberal regime, (3) conservative regime, (4) southern regime, and (5) post-socialist regime.

In the first step, this article applied *gender-separate sequence analyses* to capture late working life trajectories between the ages of 50 to 65 years of women (n = 10,913) and men (n = 10,614) separately. Secondly, using *cluster analysis*, eight distinct types of late working life trajectories are derived. Thirdly, *multinomial logistic regression* models are employed to investigate the relationship between clusters of late working life trajectories and prior family history, and how this relationship is influenced by welfare regimes. Findings are presented as *average marginal effects* in percentage points.

Results show that late working life trajectories differ heavily between women and men. The late working life of women exhibits significant diversity, characterized by engagement in full-time employment, part-time employment, or domestic duties. Men on the other hand, are mostly in continous full-time employment and their late working life trajectories only differ by retirement timing. Moreover, among women, earlier family history is linked to a higher probability of being in part-time or domestic work in late working life. However, men's late working life is largely unaffected by earlier family history – those men with a family history are more likely to work full-time employment in later life. The caregiving burden among women is stronger in southern and conservative welfare regimes and less pronounced in social democratic welfare regimes.

Women still experience path dependencies up until late working life regarding their earlier employment decisions based on family history (e.g. labor market exit due to childcare responsibilities), in contrast to largely unaffected men. However, the results imply that social policies matter significantly. For instance, women in Nordic countries that offer greater access to childcare facilities are less disadvantaged by earlier family history. Policymakers need to address gender inequalities in earlier life as they have the potential to accumulate (e.g. less work experience) and adversely affect women's late working life. Thus, instead of tackling problems once they arise, such as trying to buffer workforce shortages by raising retirement ages, life course policies are necessary to mitigate the negative cumulative consequences of the gendered burden of care for older women's employment participation.

The second article in Chapter 3 entitled *Do Covid-19 Containment Measures Reshape Late Working Life in Europe in the Mid-Term? Insights from the Second SHARE Corona Survey* compares the consequences of different social policies, implemented during the Covid-19 Pandemic aimed at preventing the spread of the virus, for the employment participation of older workers 1.5 years after the outbreak. Moreover, it specifically compared how those containment measures are differently related to women's and men's workforce participation over the mid-term. It is essential to gain a comprehensive understanding of how the Covid-19 Pandemic may have resulted in lasting consequences for older workers, especially concerning the fragility of the pension system and the shortage of older workers. The Pandemic could potentially exacerbate workforce losses and increase gender inequality. If this is the case, policymakers may still need to address the adverse repercussions of the Pandemic by implementing measures to strengthen the older workforce.

To date, there is a lack of understanding regarding how various containment measures, such as the closure of shops and childcare facilities, may differ in their consequences for the employment of older workers. Furthermore, the gendered aspects of these policies, that is, their differential impact on women's workforce participation in contrast to men, remain largely unknown. Additionally, most research has focused on the short-term effects and has yet to consider how the Pandemic, coupled with its containment measures, may have lasting consequences for older workers. Aiming to fill the discussed research gaps, this article takes advantage of the diversity of these mitigation measures across 26 European countries by linking country-level data from the European Centre of Disease Prevention and Control with individual-level data from the second SHARE Corona Survey including respondents aged 50 years and older (n = 9,186). Thus, in this article I intend to answer the following research

question: Which containment measures impact late-working life over the mid-term, and how does this association differ between women and men?

In sum, seven *containment measures* were included in the analysis and measured by the number of weeks from March 2020 to August 2021 during which individuals were exposed to them: (1) Stay-at-home order, (2) Closure of daycare facilities, (3) Closure of public transport, (4) Limit of social gathering indoors, (5) Teleworking recommendations, (6) Closure of cafés & restaurants, and (7) Closure of nonessential shops. Older worker's *employment participation* consists of the employment status that respondents reported at the time of the interview (between June and August 2021). It encompassed five categories: (1) Retired, (2) Employed, (3) Unemployed, (4) Sick or disabled, and (5) Homemaker and other.

Containment measures are still adversely linked to the employment participation of older workers. However, these virus suppression policies are differently related to women and men. Particularly, the closure of childcare facilities and non-essential shops has the most adverse impact on employment, particularly among women. As a consequence, women are more likely to exit the workforce completely to retire or to become homemakers. Men on the other hand are more strongly affected by unemployment. Policymakers must continue to address the adverse consequences of containment measures, as these measures have lasting repercussions and continue to affect the older workforce 1.5 years after the outbreak of the Pandemic. Specifically, when considering future health crises, policymakers should exercise caution when implementing measures such as the closure of childcare facilities and non-essential shops, as these can have lasting detrimental consequences.

Chapter 4, the final study of this dissertation entitled *Social relationships, living arrangements and loneliness* investigates how the living arrangements with the partner (coresidential partnership, living apart together (LAT) partnership, no partnership) are related to their social embeddedness (social network size and diversity) and how both, in turn, are linked to loneliness in very old age. Gaining knowledge of the social embeddedness of the oldest-old is crucial for understanding their social support resources during times of need. While the partner is often considered as the most crucial support source, the likelihood of losing one's partner increases in very old age. Therefore, it's necessary to understand whether the oldest-old can compensate for partner loss or absence, for example by maintaining a larger network of social relationships. This is particularly important in mitigating the risk of loneliness, which can lead to poorer health and well-being.

Up until now, research has largely neglected how the living arrangements with the partner may be interrelated with the social embeddedness of the oldest-old. Moreover, it's

largely unknown how various types of living arrangements and social relationships may be differently related to loneliness among those in very old age. This study tackles previous shortcomings using cross-sectional data from the Quality of Life and Well-Being of the Very Old in North Rhine-Westphalia (NRW80+) in Germany, which includes respondents aged 80 years and older (n = 1860) to answer the following research question: *How do the living conditions of the oldest-old relate to their social embeddedness, and to what extent do these living conditions and overall social embeddedness account for feelings of loneliness?*

This article differentiates between three categories to describe the living arrangement with the partner: (1) Coresidential partnership, (2) LAT partnership, and (3) living without a partner. The social embeddedness (social relationship diversity and size) of the oldest-old is based on their reported personal network, that is, consisting of up to four of the most important people in his/her life including the social relationship type (e.g friend, sibling, etc.). Loneliness was assessed using the question: "How often did you feel lonely in the last week?".

The outcome of the study shows that the living arrangement with the partner is linked to the characteristics of the social network of the oldest-old. Compared to those within a coresidential partnership, respondents without a partner reported a more diverse social network, that is, siblings, other family members, and acquaintances were more frequently mentioned by them. However, among the oldest-old individuals in a LAT partnership, there was evidence of having the smallest and least varied social networks, whereas those in cohabiting partnerships reported the largest network sizes. Furthermore, individuals living in a LAT partnership experienced levels of loneliness comparable to those who were without a partner. Having a coresidential partnership is the most protective against loneliness. A larger social network size is also buffering negative feelings of loneliness.

The absence of a partner often prompts individuals to actively adapt their social networks to fulfill their needs. Having a coresidential partner and a larger social network can act as buffers against feelings of loneliness. Those without a partner or in (LAT) partnerships, face heightened vulnerability to loneliness because they also had smaller social networks compared to those with a coresidential partner.

1.5 Conclusion and political implications

This dissertation has contributed to a more comprehensive understanding of the challenges faced by aging societies from two distinct perspectives: (1) Working life among those aged 50

years and older and (2) social relationships of the oldest-old. In the following, I will present a conclusion and political implications for each domain separately before aiming to connect both domains to draw an overall closing synthesis.

In the first domain, I explored the employment participation of older workers, with a specific focus on gendered employment risks. The most crucial takeaways of the findings within the first domain of this dissertation can be summarized in three key ways. First, the results underline that path dependencies of earlier life course events matter and can even cumulate in their influence on late working life – especially among disadvantaged groups such as women. Earlier employment decisions (e.g. workforce exit) based on past family events such as childbirth, have the potential to determine women's employment participation up until late working life. As a consequence of such earlier family histories, older women are more likely to be part-time employed or in domestic work. Men on the other hand are largely unaffected by their family history and continue to work in full-time employment either way in later life. Additionally, my findings demonstrate that earlier disadvantages, such as job loss during the Covid-19 Pandemic, can leave a lasting scar on older workers (e.g., skill mismatch). Job loss can have enduring consequences for the older workforce, as older workers encounter challenges in re-entering the labor market and may ultimately decide to exit completely. I find that past containment measures implemented to prevent the spread of the Covid-19 virus are linked to lasting consequences, such as long-term unemployment or early retirement, among older workers 1.5 years after the outbreak.

Secondly, labor market shocks such as the health crisis during the Covid-19 Pandemic can potentially reinforce social inequalities in late working life, particularly affecting those who are already on the margins of the labor market. Policy measures implemented during the Covid-19 Pandemic to prevent the spread of the virus were more adversely affecting women's workforce participation compared to men. My findings imply that women are doubly disadvantaged: Not only did women have to manage the increased unpaid care demand, particularly due to the closure of childcare facilities, sacrificing their employment participation, but they were also more susceptible to job loss. This was because they were more likely employed in sectors that were directly affected by containment measures, such as the closure of non-essential shops. As a consequence, women were more likely than men to exit the workforce completely to retire or to become a homemakers.

Thirdly, the national context, their social policies and accompanied social norms can provide an opportunity structure for individuals that can either exacerbate or mitigate social inequalities concerning extending employment participation in late working life. My results

strongly imply that the employment risks such as the gendered burden of care are less pronounced in those countries that do not regard families and therefore women as the main providers of unpaid care. The findings show a strong North-South divide in Europe in this regard. Countries in northern Europe with less gender inequality in labor market participation in late working life tend to offer more extensive social welfare benefits, such as access to childcare facilities or flexible working arrangements. In contrast, Southern and Western European societies, where access to childcare is limited and women are primarily viewed as the main caregivers, experienced more pronounced gendered care burdens, and consequently, in those countries, older women were more likely to in domestic work or part-time employment in later life.

Taken together, to strengthen the workforce and to extend working life it's not sufficient to simply raise retirement ages because it neglects those, especially women, without opportunities to prolong their employment career (Crossdale et al. 2022). Furthermore, these gender discrepancies are at danger to intensify during labor market shocks such as the Covid-19 Pandemic. It's increasingly difficult for women with unpaid care responsibilities to be able to stay in employment longer. Women may face increased barriers to reenter the workforce over the life course, for instance due to decreased work experience or gender discrimination (Murdock et al. 2021, Ayalon et al. 2021), if they had to disrupt their employment in earlier life due to caregivging burdens. Policies with a focus on the life course are necessary to sustainably strengthen the workforce as it's not a quick fix, because the adverse consequences of women exiting employment due to caregiving burdens can accumulate and have long-lasting adverse effects that extend into late working life. Thus, extending working lifes and strengthening the workforce requires women to be able to stay in the labor market despite family events such as childbirth. Policymakers have to rethink the perceptions of gender arrangements and implement measures that take the load of unpaid care work off women.

Particularly during the Covid-19 Pandemic, European governments largely left women to navigate challenges on their own. For instance, compared to men, women were more often ineligible to benefit from measures implemented to mitigate the negative consequences of the Pandemic, such as short-term work benefits because they are more frequently employed in precarious jobs (Moehring et al. 2021). Moreover, containment measures increased the caregiving burden and more frequently affected those jobs held by women, and they continue to experience lasting adverse repercussions concerning their employment because they likely had problems re-entering the workforce if they lost their jobs (Murdock et al. 2021, Filomena 2023). Governments must be mindful of the gendered consequences of such measures,

especially during future health crises but also because they still have to compensate for the adverse consequences of the Pandemic.

Taken together, recommendations for such gender-inclusive life course policies could include promoting flexible work arrangements, such as those enabling temporary reductions in working hours and facilitating easier re-entry into the workforce. These measures can help alleviate the negative gendered effects of career interruptions. Furthermore, the implementation of public policies concerning childcare or leave options, as commonly seen in northern European countries, holds the potential to bolster female participation in late working life. Finally, within societal cultural perceptions, caregiving should not be solely regarded as women's responsibility but rather as a shared responsibility with men. Normalizing behaviors such as men taking parental leave can help shift these cultural perceptions (Pinho and Gaunt 2021).

In the second domain, I focused on the social embeddedness of the oldest-old aged 80 years and over in Germany, North-Rhine Westphalia. In the following, I summarize the three most crucial insights from the findings within the second domain. Firstly, having a coresidential partner and being connected to a larger number of social relationships, can prevent loneliness among the oldest-old. Especially having a coresidential partner is the most protective. Those without a partner or who do not share the same household with them are more likely to feel lonely, this is especially so because they also tend to maintain a smaller social network size – compared to those in a coresidential partnership. The importance of a coresidential partner to buffer loneliness in very old age, may be explained by the socio-emotional selectivity theory that especially close relationships are satisfying enough in very old age (Carstensen 1992). However, in my opinion, it may also indicate a lack of social connectedness among the oldest-old, as they seem to rely predominantly on their partner. Additionally, as it appears, they are also dependent on their partner concerning their social network size – as they seemingly took advantage of increasing their network through them by sharing the same social contacts. As a consequence, they may lack sufficient alternative sources of feeling connected and receiving support to buffer feelings of loneliness if the partner is not available anymore.

Secondly, the findings do indicate that the oldest-old proactively adjusted their social network to meet their needs in the absence of a partnership and maintained a more diverse social network including siblings, other family members, and acquaintances. However, those in a LAT partnership are worse off than those without a partner. This highlights, thirdly, the importance of future research to distinguish between being in a coresidential and LAT partnerships. Those

in a LAT partnership not only reported smaller but also less diverse social networks compared to those in a coresidential partnership and to those without a partner. This may be a phenomenon among the oldest-old and could largely be explained by the increased probability of the oldest-old having to live in institutional care and therefore not being geographically close to their community anymore (Mauritz and Wagner 2021).

Overall, social resources in very old age are crucial to ensure their health and well-being and the ability to cope with critical life events such as health decline or spousal loss (Ellwardt 2022). However, policymakers in most European countries largely neglected to promote the importance of building a sustainable social network over the life course. Especially future generations may not be able to rely on their children to provide support, either due to increasing rates of childlessness or changing social norms regarding the willingness to provide care for their parents (Hess et al. 2023, Wagner and Valdés Cifuentes 2014, Eurostat 2020). That's unfortunate because experiencing longevity is also associated with a greater likelihood of experiencing health issues such as multimorbidity (Brijoux et al. 2021). Moreover, it's already expected that loneliness may be the next epidemic (Ellwardt 2022). For instance, the government in the UK already established a Ministry of Loneliness (Pimlott 2018). Thus, provisions for one's old age should not only be considered financially but also in terms of social resources. Maintaining a social support infrastructure involves not only having a partner but also cultivating a diverse social network that can help compensate for the absence of a partner or children. Governments could promote the importance of social resources and provide opportunities for social networking. Another measure could be to fight the stigma of loneliness. Feeling lonely may still be perceived as a personal failure, which can make it even more difficult to reach out for support.

Finally, having concluded both domains separately in this dissertation, I also argue that both domains should be regarded as interconnected and that together, they provide a fuller picture of the challenges faced by aging societies. Reaching very old age in good health is dependent on the past life course (Motel-Klingebiel et al. 2013, Himmelreicher et al. 2008). That is, those who worked in physically demanding jobs may experience poorer health in very old age and therefore may be more dependent on social support (Nilsen et al. 2022). Moreover, women who acted as the main caregivers throughout their life and consequently had discontinuous career trajectories, are more frequently affected by poverty in old age, especially as widowers (Fey and Wagner 2023, Statistisches Bundesamt 2023, Muller et al. 2020). Hence,

they may also be more dependent on receiving financial social support from their social network but may also be doubly disadvantaged because social activities, such as eating out, are not always affordable. Women who were responsible for caregiving in the past may also be likely to continue giving care in very old age – for example for their partner and probably at the expense of their own health and investment in other social contacts (Arbel et al. 2023). Moreover, co-workers and colleagues from past employment careers could also be great lasting social resources within one's social network in very old age. Such acquaintances could be contacted in times of need, for example, to receive informal support (e.g. advice) – a social resource that women may more frequently miss out on compared to men (Cohn-Schwartz and Naegele 2023).

Overall, I argue that the increasing number of care-dependent individuals in very old age can't be completely shouldered by women at the expense of their employment careers and thus the overall shortage of skilled workers. Neither can an individual's additional proactive investment in a supportive social infrastructure fully cover the increasing demand for care in very old age. I argue that governments do not get around to increasing their investments in professional care. Such increased investment is also promising in strengthening the female workforce and alleviating the potentially increased care demand of the oldest-old (Geyer et al. 2024).

Although demographic change is accompanied by challenges such as the fragility of the pension and care system, it also brings more opportunities for active aging which should be increasingly promoted by European governments. They should implement policies that proactively promote active aging from a life course perspective instead of tackling problems once they arise. This is achieved by establishing environments that empower individuals to maintain independence and promote healthy living for as long as possible. Examples include social inclusion and active community participation, as well as employment opportunities aimed at addressing caregiving burdens, gender discrimination, and promoting lifelong learning (European Commission 2018, Foster and Walker 2021).

1.6 Publication status and contribution of co-authors

1st Article (Chapter 2): The study entitled *Gendered late working life trajectories, family history and welfare regimes: evidence from SHARELIFE* is authored together with Laura Naegele, Frerich Frerichs and Lea Ellwardt. As the first author, I wrote the article and was responsible for the conceptualization, methodology, data preparation and formal analysis of the study. Laura Naegele and Lea Ellwardt assisted the conceptualization, methodology and writing of the article. They both reviewed and edited the paper. Lea Ellwardt and Frerich Frerichs supervised the drafting of the manuscript. The study is published in the European Journal of Ageing.

2nd Article (Chapter 3): The manuscript entitled *Do Covid-19 Containment Measures Reshape Late Working Life in Europe in the Mid-Term? Insights from the Second Share Corona Survey* is single-authored and under review at the Journal of European Social Policy

3rd Article (Chapter 4): The article entitled *Social relationships, living arrangements and loneliness* is authored together with Stefan Mauritz and Michael Wagner. As a leading author, I contributed to the conceptualization, methodology, and formal analysis and wrote the article. Stefan Mauritz reviewed and edited the original draft. Michael Wagner supervised the preparation of the manuscript. The article is published in Zeitschrift für Gerontologie und Geriatrie.

1.7 References

Aisenbrey S, Fasang AE (2010) New life for old ideas: the "second wave" of sequence analysis bringing the "course" back into the life course. Sociol Methods Res 38(3):420–462. doi: 10.1177/0049124109357532

Anttonen A, Sipilä J (1996) European social care services: is it possible to identify models ? J Eur Soc Policy 6(2):87–100. doi: 10.1177/095892879600600201

Arbel I, Cameron JI, Trentham B, Dawson DR (2023) A narrative inquiry into how oldest-old care-givers of people with dementia manage age-related care-giving challenges. Ageing Soc:1–30. doi: 10.1017/S0144686X23000673

Ayalon L, Chasteen A, Diehl M, Levy BR, Neupert SD, Rothermund K, Tesch-Römer C, Wahl H-W (2021) Aging in times of the Covid-19 pandemic: avoiding ageism and fostering intergenerational solidarity. J Gerontol B Psychol Sci Soc Sci 76(2):e49-e52. doi: 10.1093/geronb/gbaa051

Backes G, Clemens W (2013) Lebensphase Alter. Beltz Verlagsgruppe

Bengtson VL, Elder GH, Putney NM (2016) The lifecourse perspective on ageing: linked lives, timing, and history. In: Johnson ML, Bengtson VL, Coleman PG, Kirkwood TBL (eds) The Cambridge handbook of age and ageing. Cambridge University Press, pp 493–501

Bettio F, Verashchagina A (2009) Gender segregation in the labour market. Root causes, implications and policy responses in the EU. Bureau voor Officiële Publicaties der Europese Gemeenschappen, Luxembourg

Böger A, Huxhold O, Wolff JK (2017) Wahlverwandtschaften: Sind Freundschaften für die soziale Integration wichtiger geworden? In: Mahne K, Wolff JK, Simonson J, Tesch-Römer C (eds) Altern im Wandel. Springer Fachmedien Wiesbaden, Wiesbaden, pp 257–271

Brijoux T, Woopen C, Zank S (2021) Multimorbidität in der Hochaltrigkeit und ihre Auswirkung auf Lebensergebnisse (Multimorbidity in old age and its impact on life results). Z Gerontol Geriatr 54(Suppl 2):108–113. doi: 10.1007/s00391-021-01920-9

Brugiavini A, Buia RE, Ferrari I, Gao Y, Simonetti I (2023) 14 Work interruptions and medium-term labour market outcomes of older workers during the Covid-19 pandemic. In: Börsch-Supan A, Abramowska-Kmon A, Andersen-Ranberg K, Brugiavini A, Chłoń-Domińczak A, Jusot F, Laferrère A, Litwin H, Smolić Š, Weber G (eds) Social, health,

and economic impacts of the Covid-19 pandemic and the epidemiological control measures. De Gruyter, pp 149–162

Brugiavini A, Buia RE, Simonetti I (2022) Occupation and working outcomes during the coronavirus pandemic. Eur J Ageing 19(4):863–882. doi: 10.1007/s10433-021-00651-5

Bui TTM, Button P, Picciotti EG (2020) Early evidence on the impact of coronavirus disease 2019 (Covid-19) and the recession on older workers. Public Policy Aging Rep 30(4):154–159. doi: 10.1093/ppar/praa029

Cantor MH (1979) Neighbors and friends. Res Aging 1(4):434–463. doi: 10.1177/016402757914002

Carstensen LL (1992) Social and emotional patterns in adulthood: support for socioemotional selectivity theory. Psychol Aging 7(3):331–338. doi: 10.1037/0882-7974.7.3.331

Cohn-Schwartz E, Naegele L (2023) Employment over the life course and post-retirement social networks: a gendered perspective. Int Psychogeriatr:1–11. doi: 10.1017/S1041610223000558

Crossdale R, Foster L, Walker A (2022) Comparative report on the national policies and political-economic context of Germany, Poland, Sweden, and the UK. Rapporter från Åldrande och social förändring, vol 8. Linköping University Electronic Press, Linköping

Dannefer D (2003) Cumulative advantage/disadvantage and the life course: cross-fertilizing age and social science theory. J Gerontol B Psychol Sci Soc Sci 58(6):S327-37. doi: 10.1093/geronb/58.6.S327

Dykstra PA, Jong Gierveld J de (2004) Gender and marital-history differences in emotional and social loneliness among Dutch older adults. Can J Aging 23(2):141–155. doi: 10.1353/cja.2004.0018

ECDC (2022) Data on country response measures to Covid-19. https://www.ecdc.europa.eu/en/publications-data/download-data-response-measures-covid-19

Elder GH, Johnson MK, Crosnoe R (2003) The emergence and development of life course theory. In: Kaplan HB, Mortimer JT, Shanahan MJ (eds) Handbook of the life course. Springer US, Boston, MA, pp 3–19

Ellwardt L (2022) The social safety net: implications for resilience in old age. In: La Haye K de (ed) Social networks to support food and nutrition security: a case study in the United States. Edward Elgar Publishing, pp 225–238

Ellwardt L, Hank K (2019) Soziale Netzwerke im Alter. In: Hank K, Schulz-Nieswandt F, Wagner M, Zank S (eds) Alternsforschung. Nomos Verlagsgesellschaft mbH & Co. KG, pp 339–356

Ellwardt L, van Tilburg T, Aartsen M, Wittek R, Steverink N (2015) Personal networks and mortality risk in older adults: a twenty-year longitudinal study. PloS One 10(3):e0116731. doi: 10.1371/journal.pone.0116731

Esping-Andersen G (1989) The three worlds of welfare capitalism, 1., Auflage. Wiley, J, New York, NY

European Commission (2018) Active ageing. https://www.eurofound.europa.eu/en/european-industrial-relations-dictionary/active-ageing

European Commission (2021) The 2021 ageing report. Economic & budgetary projections for the EU member states (2019-2070). European Economy Institutional paper, 148 (May 2021). Publications Office of the European Union, Luxembourg

Eurostat (2020) Ageing Europe - statistics on population developments. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Ageing_Europe_-_statistics_on_population_developments#Older_people_.E2.80.94_population_overview

Fasang AE (2010) Retirement: institutional pathways and individual trajectories in Britain and Germany. Sociol Res Online 15(2):1–16. doi: 10.5153/sro.2110

Fervers L, Tobler L, Knize V, Christoph B, Jacob M (2023) Kids back to school – parents back to work? School and daycare opening and parents' employment in the early phase of the Covid-19 pandemic. J Eur Soc Policy 33(3):373–387. doi: 10.1177/09589287231176775

Fey J, Wagner M (2023) Das Einkommen der Hochaltrigen in Deutschland. In: Kaspar R, Simonson J, Tesch-Römer C, Wagner M, Zank S (eds) Hohes Alter in Deutschland, vol 8. Springer Berlin Heidelberg, Berlin, Heidelberg, pp 41–62

Filomena M (2023) Unemployment scarring effects: an overview and meta-analysis of empirical studies. Ital Econ J. doi: 10.1007/s40797-023-00228-4

Foster L, Walker A (2021) Active ageing across the life course: towards a comprehensive approach to prevention. Biomed Res Int 2021:6650414. doi: 10.1155/2021/6650414

Geissler B (2007) Biografisches Handeln in Ungewissheit. Neuere Entwicklungen in der Politik des Lebenslaufs. In: Hildebrandt E (ed) Lebenslaufpolitik im Betrieb. Optionen zur Gestaltung der Lebensarbeitszeit durch Langzeitkonten. Ed. Sigma, Berlin, pp 25–42

Geyer J, Haan P, Teschner M (2024) Ausbau der Pflegeversicherung könnte Gender Care Gap in Deutschland reduzieren. DIW - Deutsches Institut für Wirtschaftsforschung

Gierveld JDJ, van Tilburg T (2006) A 6-Item scale for overall, emotional, and social loneliness. Res Aging 28(5):582–598. doi: 10.1177/0164027506289723

Greenfield EA, Russell D (2011) Identifying living arrangements that heighten risk for loneliness in later life. J Appl Gerontol 30(4):524–534. doi: 10.1177/0733464810364985

Hawkley LC, Cacioppo JT (2010) Loneliness matters: a theoretical and empirical review of consequences and mechanisms. Ann Behav Med 40(2):218–227. doi: 10.1007/s12160-010-9210-8

Hess M, Naegele L, Becker L, Mäcken J, Tavernier W de (2021) Planned retirement timing in Europe: are Europeans adapting to the policy of extending working lives. Front Sociol 6:691066. doi: 10.3389/fsoc.2021.691066

Hess M, Schmitz W, Naegele L, Stiemke P (2023) You will take care of me when I am old: norms on children's caregiver obligations - an analysis with data from the European Values Study. JFamRes 35:196–211. doi: 10.20377/jfr-854

Hilz R, Wagner M (2018) Marital status, partnership and health behaviour: findings from the German Ageing Survey (DEAS). Comp Popul Stud 43. doi: 10.12765/CPoS-2018-08

Himmelreicher R, Sewöster D, Scholz R, Schulz A (2008) Die fernere Lebenserwartung von Rentnern und Pensionären im Vergleich. WSI-Mitteilungen(5):274–280

Holman D, Walker A (2021) Understanding unequal ageing: towards a synthesis of intersectionality and life course analyses. Eur J Ageing 18(2):239–255. doi: 10.1007/s10433-020-00582-7

Hoven H, Dragano N, Blane D, Wahrendorf M (2018) Early adversity and late life employment history—a sequence analysis based on SHARE. Work Aging Retire 4(3):238–250. doi: 10.1093/workar/wax014

Kahn RL, Antonucci TC (1980) Conovys over the life course: attachment, roles, and social support. In: Baltes PB, Brim OB (eds) Lifespan development and behavior, Vol. 3. Academic Press, New York, pp 253–286

Kapelle N, Monden C (2024) Transitory or chronic? Gendered loneliness trajectories over widowhood and separation in older age. J Health Soc Behav:221465231223719. doi: 10.1177/00221465231223719

Kaspar R, Simonson J, Tesch-Römer C, Wagner M, Zank S (2023) Gutes Leben im hohen Alter: Fazit und Implikationen. In: Kaspar R, Simonson J, Tesch-Römer C, Wagner M, Zank S (eds) Hohes Alter in Deutschland, vol 8. Springer Berlin Heidelberg, Berlin, Heidelberg, pp 289–300

Kohli M (1997) Die Institutionalisierung des Lebenslaufs. In: Friedrichs J, Mayer KU, Schluchter W (eds) Soziologische Theorie und Empirie. VS Verlag für Sozialwissenschaften, Wiesbaden, pp 284–312

Komp-Leukkunen K (2019) Capturing the diversity of working age life-courses: a European perspective on cohorts born before 1945. PloS One 14(2):e0212400. doi: 10.1371/journal.pone.0212400

König R, Seifert A (2022) Digitally savvy at the home office: computer skills of older workers during the Covid-19 pandemic across Europe. Front Sociol 7:858052. doi: 10.3389/fsoc.2022.858052

Kuitto K, Helmdag J (2021) Extending working lives: how policies shape retirement and labour market participation of older workers. Soc Policy Adm 55(3):423–439. doi: 10.1111/spol.12717

Lacey R, Stafford M, Sacker A, McMunn A (2016) Work-family life courses and subjective wellbeing in the MRC National Survey of Health and Development (the 1946 British birth cohort study). J Popul Ageing 9:69–89. doi: 10.1007/s12062-015-9126-y

Lalive R, Zweimüller J (2009) How does parental leave affect fertility and return to work? Evidence from two natural experiments. Q J Econ 124(3):1363–1402. doi: 10.1162/qjec.2009.124.3.1363

Luhmann M, Bücker S (2019) Einsamkeit und soziale Isolation im hohen Alter. https://hss-opus.ub.ruhr-uni-bochum.de/opus4/frontdoor/index/index/docId/6373

Mäcken J (2019) Work stress among older employees in Germany: effects on health and retirement age. PloS One 14(2):e0211487. doi: 10.1371/journal.pone.0211487

Madero-Cabib I, Fasang AE (2016) Gendered work–family life courses and financial well-being in retirement. Adv Life Course Res 27:43–60. doi: 10.1016/j.alcr.2015.11.003

Martikainen P, Nihtilä E, Moustgaard H (2008) The effects of socioeconomic status and health on transitions in living arrangements and mortality: a longitudinal analysis of elderly finnish men and women from 1997 to 2002. J Gerontol B Psychol Sci Soc Sci 63(2):S99-109. doi: 10.1093/geronb/63.2.S99

Mauritz S, Wagner M (2021) LAT relationships: a new living arrangement among the oldest old population in Germany? Dem Res 44:349–362. doi: 10.4054/DemRes.2021.44.14

Moehring K, Reifenscheid M, Weiland A (2021) Is the recession a ‘shecession’? Gender inequality in the employment effects of the Covid-19 pandemic in Germany

Möhring K (2016) Life course regimes in Europe: individual employment histories in comparative and historical perspective. J Eur Soc Policy 26(2):124–139. doi: 10.1177/0958928716633046

Motel-Klingebiel A, Naegele G (2022) Exclusion and inequality in late working life in the political context of the EU. Linköping University Electronic Press

Motel-Klingebiel A, Ziegelmann JP, Wiest M (2013) Hochaltrigkeit in der Gesellschaft des langen Lebens. Theoretische Herausforderung, empirisches Problem und sozialpolitische Aufgabe (Very old age in an ageing society. Theoretical challenges, empirical problems and sociopolitical responsibilities). Z Gerontol Geriatr 46(1):5–9. doi: 10.1007/s00391-012-0458-4

Muller JS, Hiekel N, Liefbroer AC (2020) The long-term costs of family trajectories: women's later-life employment and earnings across europe. Demography 57(3):1007–1034. doi: 10.1007/s13524-020-00874-8

Murdock E, Filbig M, Borges Neves R (2021) Unemployment at 50+: economic and psychosocial consequences. In: Walsh K, Scharf T, van Regenmortel S, Wanka A (eds) Social exclusion in later life, vol 28. Springer International Publishing, Cham, pp 47–60

Naegele G, Walker A (2021) EIWO's theoretical perspectives. EIWO working paper. Linköping University Electronic Press, Linköping

Nilsen C, Darin-Mattsson A, Hyde M, Wastesson JW (2022) Life-course trajectories of working conditions and successful ageing. Scand J Public Health 50(5):593–600. doi: 10.1177/14034948211013279

OECD (2020) COVID-19 and the retail sector: impact and policy responses. OECD policy responses to coronavirus (Covid-19). https://www.oecd.org/coronavirus/policy-responses/covid-19-and-the-retail-sector-impact-and-policy-responses-371d7599/

Pimlott N (2018) The ministry of loneliness. Can Fam Physician 64(3):166

Pinho M, Gaunt R (2021) Doing and undoing gender in male carer/female breadwinner families. Community Work Fam 24(3):315–330. doi: 10.1080/13668803.2019.1681940

Pinquart M (2003) Loneliness in married, widowed, divorced, and never-married older adults. J Soc Pers Relat 20(1):31–53. doi: 10.1177/02654075030201002

Pinquart M, Sorensen S (2001) Influences on loneliness in older adults: a meta-analysis. Basic Appl Soc Psychol 23(4):245–266. doi: 10.1207/S15324834BASP2304_2

Schmitz A, Quashie NT, Wagner M, Kaschowitz J (2022) Inequalities in caregiving strain during the Covid-19 pandemic: conceptual framework and review of the empirical evidence. Int J Care:1–14. doi: 10.1332/239788221X16592761870899

Schwartz E, Litwin H (2018) Social network changes among older Europeans: the role of gender. Eur J Ageing 15(4):359–367. doi: 10.1007/s10433-017-0454-z

Statistisches Bundesamt (2023) Gender pension gap: Alterseinkünfte von Frauen 2021 fast ein Drittel niedriger als die von Männern. https://www.destatis.de/DE/Presse/Pressemitteilungen/2023/03/PD23_N015_12_63.html

Suitor JJ, Gilligan M, Pillemer K (2016) Stability, change, and complexity in later-life families. In: Handbook of Aging and the Social Sciences. Elsevier, pp 205–226

Ulrich Mayer K (2004) Whose lives? How history, societies, and institutions define and shape life courses. Res Hum Dev 1(3):161–187. doi: 10.1207/s15427617rhd0103_3

Wagner M, Valdés Cifuentes I (2014) The pluralisation of living arrangements – a continuous trend? CPoS 39(1). doi: 10.12765/CPoS-2014-03

Wahrendorf M, Zaninotto P, Hoven H, Head J, Carr E (2018) Late life employment histories and their association with work and family formation during adulthood: a sequence analysis based on ELSA. J Gerontol B Psychol Sci Soc Sci 73(7):1263–1277. doi: 10.1093/geronb/gbx066

WHO (2023) WHO commission on social connection. https://www.who.int/groups/commission-on-social-connection

Worts D, Corna L, Sacker A, McMunn A, McDonough P (2016) Understanding older adults' labour market trajectories: a comparative gendered life course perspective. LLCS 7(4). doi: 10.14301/llcs.v7i4.389

Wrzus C, Hänel M, Wagner J, Neyer FJ (2013) Social network changes and life events across the life span: a meta-analysis. Psychol Bull 139(1):53–80. doi: 10.1037/a0028601

Zamberlan A, Gioachin F, Gritti D (2021) Work less, help out more? The persistence of gender inequality in housework and childcare during UK Covid-19. Res Soc Stratif Mobil 73:100583. doi: 10.1016/j.rssm.2021.100583

Zimmermann J, Brijoux T, Zank S (2023) Erkrankungen, Pflegebedürftigkeit und subjektive Gesundheit im hohen Alter. In: Kaspar R, Simonson J, Tesch-Römer C, Wagner M, Zank S (eds) Hohes Alter in Deutschland, vol 8. Springer Berlin Heidelberg, Berlin, Heidelberg, pp 63–87

2. Gendered late working life trajectories, family history and welfare regimes: Evidence from SHARELIFE

2.1 Abstract

Earlier employment choices based on family events in earlier life have an impact up until late working life, especially in welfare regimes that encourage the breadwinner-caretaker division. We investigate types of late employment patterns and how these are associated with earlier family events. We also test whether the association between early family history and late working life varies across five welfare regimes. Using retrospective life history data from SHARELIFE, our sample consists of 10,913 women and 10,614 men aged 65 years and older. Late working life trajectories are analyzed using gender-separate sequence analyses, which are summarized into eight groups applying cluster analyses. Using average marginal and interaction effects, we explain how the association between types of late working life, coresidential partnership history and parenthood history differs by welfare states. For instance, women's late employment is either shaped by unpaid care or paid (full- or part-time) work but not both, whereas men's late working life is mainly shaped by full-time work. Family history in earlier life is linked to unpaid care and part-time work – an association strongest in liberal and southern welfare regimes. However, among men earlier family events are linked to full-time work. Policymakers need gender-specific strategies to integrate workers into late working life. The implementation of new policies should aim to prevent these social inequalities in early life, as employment decisions caused by family history in earlier life stages – especially for women – tend to cumulate over the life course.

2.2 Introduction

Aging societies have been challenged by a growing shortage of skilled workers and the rising costs of pensions (Lynch 2006). Consequently, policymakers have raised retirement ages to extend working lives and increase the labor market participation of older workers (Crossdale et al. 2022). However, this strategy deepens inequalities and puts disadvantages on those without opportunities to work longer (Mäcken et al. 2022, Bennett and Möhring 2015). Access to the labor market has remained impeded for certain populations, especially for women. This is unfortunate because the integration of women into the workforce is a particularly promising means of substantially enhancing the aging workforce. One explanation is that, compared to men, women are culturally expected to shoulder the lion share of unpaid care work (Meyer and Pfau-Effinger 2006). European countries largely rely on the family, and therefore women, to provide care and have not developed successful strategies to encourage women to remain in the labor force (Foster and Walker 2013). This is problematic because earlier employment choices (e.g. labor market exit, reduction of working hours) based on earlier family-related life course events such as childbirth, partnership, cohabitation, or divorce (hereinafter referred to as "family history") have an impact up until late working life, which is with variations across countries is understood as labor market participation beyond age 50 (Wahrendorf et al. 2018, Hoven et al. 2018). Consequently, women's late working lives tend to be characterized by unpaid care work or part-time employment. In contrast, men's late working histories turn out largely structured around full-time work (Komp-Leukkunen 2019, Stafford et al. 2019, Wahrendorf et al. 2018). The main purpose of this study is to, first, explore the working trajectories for the groups of men and women in late life, and second, associate these trajectories with family history across welfare regimes.

We add to and advance existing research in four ways. First, this is the first study to examine how the association between gendered late working life trajectories and earlier family history differs by five *welfare regimes* – including post-socialist countries. The majority of studies examined or compared single countries (Lacey et al. 2016, Ehrlich et al. 2020, Stafford et al. 2019, König 2017, Fasang 2010). However, the generalization of one country's findings has limitations because public policies vary across countries (Mayer 2004, Kuitto and Helmdag 2021, Möhring 2016, Mayer 2009). By comparing welfare regimes, we gain a better understanding of how individual life courses depend on different types of national contexts. Second, previous research has mostly focused on single outcomes and especially retirement timing to understand late employment (Madero-Cabib et al. 2015, König 2017, Fasang 2010,

Toczek et al. 2022, Bennett and Möhring 2015). However, explaining retirement does not provide knowledge about those older people excluded from the workforce (e.g. women). Moreover, to understand late employment it is necessary to simultaneously inspect multiple indicators anchored in employment histories. Our sequence and cluster analysis contribute to closing this research gap by capturing trajectories of late employment over time. This allows us to use the actual late employment history of our sample as an outcome instead of single employment statuses (Aisenbrey and Fasang 2010). Third, much research has insufficiently addressed the explanatory role of early family history concerning late employment trajectories, also due to the focus on shorter time periods, such as the short-term effects of caregiving on employment (Bertogg et al. 2021, Lalive and Zweimüller 2009) or multi-channel work-family sequence analyses (Lacey et al. 2016, McMunn et al. 2015, Madero-Cabib and Fasang 2016). Few studies have employed a *life course perspective* to examine how late working life is associated with family history, such as childcare or coresidential partnership (Wahrendorf et al. 2018, Worts et al. 2016, Levy and Widmer 2013). A fourth shortcoming is the investigation of groups of men and women together when deriving employment history types (Wahrendorf et al. 2018, Hoven et al. 2018). This likely obscures meaningful differences between them because women's employment histories are more disruptive than men's (Komp-Leukkunen 2019).

This study tackles previous shortcomings by analyzing how the gender-specific association between family history and late working life histories differs across five welfare regimes. We use life history data from the Survey of Health, Ageing and Retirement in Europe (SHARELIFE) to answer the following research questions: Do working life trajectories in Europe differ by gender? Can these trajectories be explained by family history? Does the association between late working life trajectories and family history vary across welfare regimes? We carry out explorative sequence analyses for the groups of men and women 15 years prior to retirement (50 to 65 years). The resulting types of employment histories serve as the outcome in a multinomial regression framework with family history and welfare regimes as predictors.

2.3 Theory and evidence

Previous research has suggested the suitability of the *life course perspective* in explaining working trajectories (Hoven et al. 2018, Madero-Cabib and Fasang 2016). Instead of examining static outcomes, the life course paradigm is dynamic, focusing on trajectories

instead of single events (Aisenbrey and Fasang 2010) and depicts individual histories in changing and processual terms. Furthermore, individual lives are linked with those of others ("linked lives"), as people are embedded in relationships with people whose life experiences have consequences for them (Bengtson et al. 2016, Settersten 2015). For example regarding our focus on employment trajectories, people in a family or partner context might coordinate their work courses with one another in order to reconcile work and child care (Naegele and Walker 2021). Hence, life and work courses (in older age) are shaped, timed and ordered by inter- and intragenerational relationships as well as earlier events in life (Elder et al. 2003). Childbirth and divorce, for instance, have resounding effects on late working life, as they impact labor market participation and retirement timing, especially for women who still bear the majority of care work (Dingemans and Möhring 2019). Individual life courses are also influenced by socio-political frameworks as the reconciliation of care and work relies heavily on institutional settings and the availability of welfare (Dannefer 2003, Elder et al. 2003, Mayer 2004).

Moreover, according to the *theory of cumulative (dis)advantages*, adversities in earlier life accumulate into growing disadvantages which are enhanced through social characteristics (e.g. gender, access to education, class membership) (Dannefer 2003). In this article, disadvantages are generally understood as being excluded from the labor market because of the gendered burden of care. Women are more likely to have disruptive employment histories because of care responsibilities, which further enhances labor market exclusion risks and leads to involuntary retirement in late working life (Komp-Leukkunen 2019, Hoven et al. 2018). This holds especially true for women with lower socio-economic status (SES) (Brandt et al. 2022) which highlights the importance of applying an *intersectional perspective* when looking at cumulative disadvantages (Holman and Walker 2020). These pathways are exacerbated by additional risks. Individuals with low education and worse health status in earlier life are more likely to experience discontinuous employment histories or to exit employment permanently in later life (Hoven et al. 2018, Hyde and Dingemans 2017).

According to the *human capital theory*, individuals weigh costs and benefits when they choose between employment and unpaid work (Becker 1965). These choices are shaped by societal norms and their reproduction via policies (Dewilde 2003). If societal norms and associated welfare state policies assign care responsibility to women, remaining in employment will only be implementable with great hurdles (De Tavernier 2016). Hence, the resulting choices may be gendered because men and women have different opportunities presented to them and these decisions are assumed to impact employment up until late working life: For

instance, past discontinuities in working life due to child-rearing among women cause less work experience which might decrease their chances of getting a job, which in turn further reduces their work experiences and employment chances over the life course. Previous research has shown long-term effects of earlier family events on late employment: Partnered women with children are more likely to be in unpaid care or part-time work in old age, whereas men are more likely to be employed full-time (Worts et al. 2016, Wahrendorf et al. 2018, Abendroth et al. 2014). However, societal norms such as traditional gender roles are assumed to be less prevalent among younger birth cohorts because of the modernisation of gender arrangements where women are not necessarily expected to exit the labor force anymore to take care of family and because of women's increasing attempt to combine employment and domestic work (Meyer and Pfau-Effinger 2006, Komp-Leukkunen 2019).

The welfare state is seen as an important factor shaping the structure of an individual's life course. Their social security institutions and policies structure employment histories by rewarding continuous employment biographies (permanent full-time employment) which are mainly valid for men, whereas women are generally expected to follow normal family biographies (marriage, childcare) (Kohli 2007, Mayer 2004, Lewis 1992). Countries can be grouped into different types of welfare regimes based on three dimensions of welfare that impact individual employment histories: decommodification (the extent of key social security programs or interventions such as unemployment insurance, pensions, public childcare and sickness insurance), social stratification (the extent to which the welfare state increases or decreases levels of social stratification) and the mix of private-public family welfare (the role of the state, the family and the market in the delivery of welfare) (Esping-Andersen 1990). In the following we summarize and compare five types of welfare regimes regarding their impact on gendered work courses: (1) *social democratic*, (2) liberal, (3) *conservative*, (4) *southern* and (5) *post-socialist regime*.

Women's attachment to the labor market is strongest in a (1) *social democratic regime* (e.g. Sweden), which supports flexible careers, the dual-earner model and public child care (Mayer 2004, Anttonen and Sipilä 1996). Countries of a (2) *liberal regime* (e.g. UK) support market mechanisms that produce welfare, which in turn encourage the traditional breadwinner-caretaker division. The (3) *conservative* (e.g. Germany) and (4) *southern regime* (e.g. Greece) on the other hand, rely heavily on women to shoulder care responsibilities (Worts et al. 2016): the *conservative regime* highly regulates working life by rewarding continuous working biographies, whereas the *southern regime* is characterized by a lack of intervention. Both

regimes produce high levels of gender inequality (Möhring 2016). Labor market participation among women compared to men in later life is lowest in the conservative and southern regimes in contrast to the social democratic and liberal regime (Crossdale et al. 2022, Worts et al. 2016). Lastly, the (5) *post-socialist* regime (e.g. Czech Republic) is generally characterized by a high prevalence of female full-time employment and only short employment disruptions due to the provision of public child care (Buchholz et al. 2008, Möhring 2016).

Despite its popularity, Esping-Andersen's typology has been criticized as limited and too simplistic: Welfare state orientations might change over time leading to countries needing to be re-allocated in the typology. Switzerland, albeit not being an undisputed case, has shifted towards the liberal model e.g., by strengthening the private sector in the delivery of welfare, while maintaining policies that are reminiscent of the conservative model (Arts and Gelissen 2002, Bonoli and Kato 2004, Obinger et al. 2010). Countries not only shift or combine characteristics of more than one welfare state but they also differ within welfare regimes. This holds especially true in the case of eastern European countries, often simply grouped into the so-called post-socialist regime, which are not only very heterogeneous regarding their impact on employment careers (Möhring 2016, Komp-Leukkunen 2019) but have also experienced vastly different socio-economic developments since the collapse of the Soviet Union (Slukhai and Borshchenko 2019).

Based on these theoretical and empirical considerations, we argue that late working life histories differ heavily by gender. First, we hypothesize that women's late working life is strongly shaped by unpaid care and part-time work compared to men, while men's late working life is mainly characterized by full-time work (*H1*). Second, we expect that family history – and therefore the years in earlier life that respondents spend in a partnership and/or with children – contribute to these inequalities: We hypothesize that family history increases the women's probability of being in domestic and part-time work (*H2a*), and the men's probability of working full-time (*H2b*). Lastly, we hypothesize that the former associations between family history and late working life trajectories are most pronounced in welfare regimes that encourage the breadwinner-caretaker division (*H3*).

2.4 Method and measurement

2.4.1 Data and sample

We used retrospective life history data from the Survey of Health, Ageing and Retirement in Europe (SHARELIFE) (Börsch-Supan 2022, Börsch-Supan et al. 2013, Bergmann et al. 2019a, Bergmann et al. 2019b). Data collection took place in 28 countries in 2017, encompassing representative samples of individuals aged 50 years and over and their partners living in private households. Wave 7, which encompasses n=77,261 observations, constitutes a retrospective survey covering employment, partnership, and parenthood history among other topics. During the data preparation, we excluded observations with incomplete employment/job sequences (n=1314; 2.22%), incomplete information on situations (e.g. domestic work, sick or disabled) between jobs (n=1294; 2.18%), incomplete partnership (n=1812; 2.87%) and parenthood histories (n=1507; 2.38%) as well as cases with inplausible information (e.g. if the reported year when respondents started a job is higher than the year when they left the job) (n=1369; 2.31%). Moreover, because we intend to examine employment trajectories, only those respondents that had been in paid employment at least once in their life were considered in our analysis (5.93% of the full sample have never been employed). To obtain complete employment histories during the ages of 50 to 65 years, only those respondents aged 65 and older were included in our sample, which were born between 1912 and 1954. Furthermore, we eliminated observations of countries outside Europe and those that may not be categorized using the welfare regime typology (see below). Our sample consists of 21 countries summarized below. The final sample included n=10,913 women and n=10,614 men. As the liberal welfare regime, with only one country, (Switzerland) is underrepresented in SHARELIFE, we conducted additional robustness checks using data from the English Longitudinal Study of Ageing (ELSA) (n=2,120 women; n=1,699 men). The data from ELSA were collected in the UK in 2007 among a representative sample of people aged 50+ years (Banks, J., Institute for Fiscal Studies et al. 2021). In doing so, we applied the same analytic procedure using ELSA to compare if the association between parenthood, partnership history and late employment trajectories among respondents in Switzerland are comparable to those in the UK. Because all relevant variables in ELSA are harmonized, they compare well with the measurements from SHARELIFE. However, we decided not to merge ELSA with SHARELIFE and therefore not to include UK in the main analysis because the timing of the data collection of both surveys is 10 years apart. ELSA therefore doesn't include information on respondents

in younger cohorts compared to SHARELIFE. The results using ELSA are applied for robustness checks in order to support our results with SHARELIFE and can be viewed in the appendix.

2.4.2 Outcome

The employment module in SHARELIFE contains information on every job that respondents have had during their employment career for at least six months. Additionally, it yielded information on gaps during which respondents were not in paid work for six or more months. This information enables us to describe the late working life histories of individuals between the ages of 50 to 65 years. If there was an overlap between the year a respondent left a job and shifted to non-paid work, we coded that year as non-paid. The dependent variable *late working life* is measured using eight categories: (1) Full-time employed, (2) Full-time self-employed, (3) Part-time employed, (4) Part-time self-employed, (5) Domestic work, (6) Sick or disabled, (7) Unemployed or inactive and (8) Retired. Domestic work is interpreted as unpaid care work. However, wave 7 of SHARELIFE only includes the year of transitions from full- and part-time or vice versa between different jobs but not within the same job – we only know if respondents have answered having 'changed multiple times between part- and full-time work' in the same job. To solve this, we coded respondents as part-time workers if they have always been working part-time in the same job, changed once to part-time, or changed multiple times between full- and part-time in each job spell. Respondents are categorized as full-time employed if they have always been working full-time or changed once to full-time in this job.

2.4.3 Predictors

The independent variable *parenthood history* counts the average number of adopted and natural children during the respondents' ages of 25 to 49 years. While acknowledging that care responsibilities for women also include other family members (e.g. older relatives), we focus on childcare here, as we are interested in studying the effect of family events in earlier life phases. *Partnership history* regards the number of years respondents spent in a coresidential partnership during the age of 25 to 49 years. Respondents that lived at least 18.75 years (75% of 25 years) in a coresidential partnership are considered to have lived 'mainly in a partnership' (1) and are otherwise coded as 'mainly without a partner' (0).

2.4.4 Moderator

To inspect variations across five *welfare regimes*, we categorized countries using a gender-sensitive typology (Komp-Leukkunen, 2019). The social democratic welfare regime consists of Sweden, Denmark, and Finland. The liberal regime includes only Switzerland. The conservative regime consists of Austria, Belgium, France, Germany, and Luxembourg. The southern regime encompasses Greece, Italy, Spain, Portugal, Malta, and Cyprus. The post-socialist regime contains Poland, Czech Republic, Hungary, Slovakia, Bulgaria, and Croatia.

2.4.5 Confounders

The analysis further controlled for *divorce*, which is coded 1 if respondents have ever been divorced in earlier life and 0 if not. Moreover we included *adult health*, measured by the number of periods of ill health or disability that have lasted for more than a year during adulthood. In addition, *child health* is subjectively rated on a scale from 1 (Excellent) to 5 (Poor), with higher values meaning poorer health during childhood. *Education* is coded into three categories using ISCED 97, which differentiates between primary or lower secondary education (1), secondary or post-secondary non-tertiary education (2) and bachelor, master, or doctoral degree or equivalent (3). *Year of birth* was included as well. Prior research found that individuals who have been divorced, that have better health, higher educational levels and those in younger birth cohorts are more attached to the labor market in late life (Komp-Leukkunen 2019, Mäcken et al. 2022, Hoven et al. 2018, Dingemans and Möhring 2019).

2.4.6 Analytical strategy

Our statistical approach follows three steps: model individual trajectories, create a typology of trajectories, and regress trajectory types on covariates. Specifically, in the first step, a *sequence analysis* models the late working life history of every respondent in the sample. In the second step, a *cluster analysis* explores distinct types of trajectories across respondents by comparing them using Optimal Matching (Studer and Ritschard 2016). Yet, while trajectories are highly homogeneous within clusters, trajectories are highly heterogeneous between clusters. This is achieved using Partitioning Around Medoids clustering (Studer 2013), as implemented in the

WeightedCluster package in *R*, which uses matrices of pairwise distances. We compared solutions with lower and higher numbers of clusters. The best solution was chosen based on indicators for model fit, particularly the Average Silhouette Width (ASW), Point Biserial Correlation (PBC), and Hubert's Gamma (HG) which are reported in Figures 1a and 1b. Each cluster represents a subpopulation of respondents that follow similar trajectories. In the third step, we use *multinomial logistic regression* models to examine the association of late working life clusters with family history (partnership and parenthood history), and moderations thereof with welfare regimes. Results are expressed as Average Marginal Effects (AME). The entire analysis is executed separately for the groups of men and women.

2.5 Results

2.5.1 Late working life trajectories

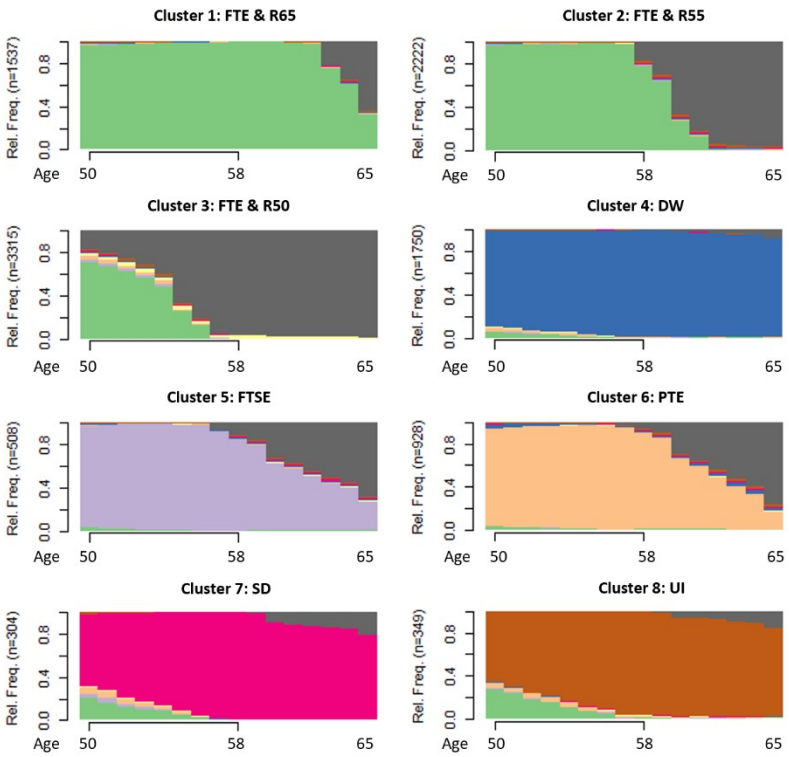
The sequence and cluster analyses revealed eight trajectories for both men and women. This solution indicated the best model fit, and its interpretation as well as cluster sizes were plausible. In both subpopulations, clusters were identified with an "Average Silhouette Width" (ASW) of > 0.5, which is considered a reasonable model fit (Studer, 2013). Figure 1 displays all clusters using chronograms, where the horizontal line shows the prevalence of employment histories from the age of 50 to 65 and the ordinate represents the percentage of each occupational state for each age. Our *H1* hypothesized that women's late working life is more frequently shaped by domestic and part-time work compared to men, while men's late working life is mainly characterized by full-time work. Our findings support this expectation. However, our results show that women are either in paid work or domestic work in late working life but there is no combination of both.

Women. Figure 1a shows that, overall, women's late working life trajectories are diverse and thus mostly either structured around full-time, part-time or domestic work. They spent 4.56 years (SD=5.34) in full-time employment, 1.42 years (SD=3.84) in part-time employment and 3.24 years (SD=6.20) in domestic work on average. Most women are in clusters 2 (20.4%) or 3 (30.4%), which are characterized by full-time work, and cluster 4 (16.0%), which is denoted by domestic work. Clusters 1, 2 and 3 are dominated by full-time work and only differ in the timing of retirement. Cluster 4 is almost completely characterized by domestic work and only a minority of women changed from full- or part-time work to domestic work. Part-time employed women are found in cluster 6, while full-time self-employed women are identified in cluster 5.

Cluster 7 contains the lowest share of women (2.8%) and is dominated by those who have been working full-time and changed to the status of being sick or disabled. Most women in cluster 8 were unemployed or inactive and have previously worked in full- or part-time. Women have been sick or disabled 0.48 years (SD=2.44) and unemployed or inactive 0.68 years (SD=2.80) on average.

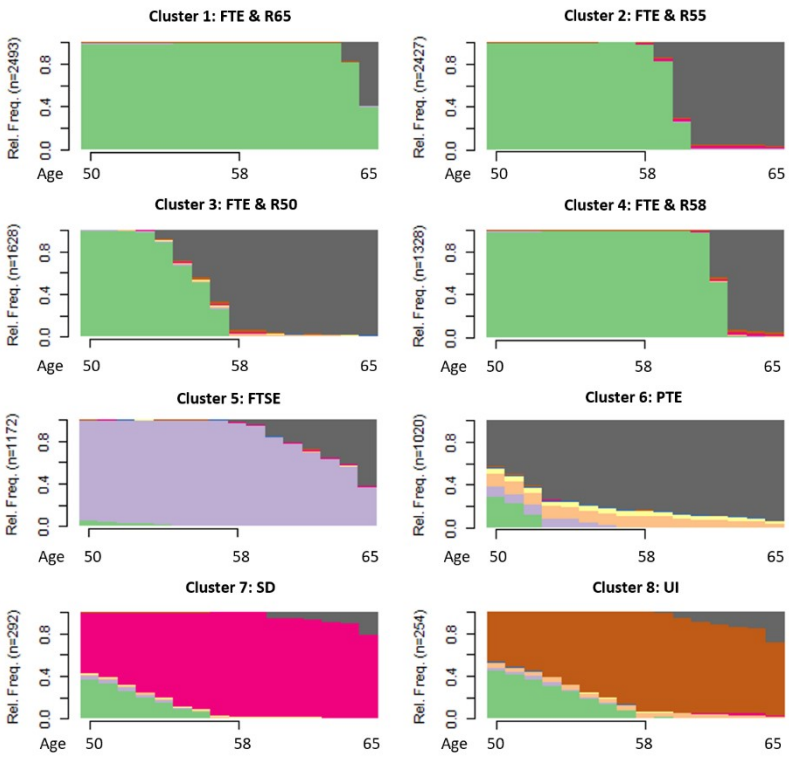
Men. Figure 1b shows that men's late working life histories are less heterogenous than women's, with working biographies mainly structured around full-time employed and self-employed work. On average, men spent 8.08 years (SD=5.58) in full-time employment and 1.91 years (SD=4.68) in full-time self-employment. Most men are found in cluster 1 (23.5%) and cluster 2 (22.9%), which are dominated by full-time work. Cluster 1, 2, 3 and 4 are mostly characterized by full-time employment but vary by their timing of retirement. Cluster 5 is characterized by full-time self-employment and retirement around the age of 60 years. Cluster 6 can be described by transitions from full- to part-time until early retirement. Cluster 7 is dominated by men who changed from full-time work to being sick or disabled. Lastly, cluster 8 depicts the transitions of working full-time to being unemployed or inactive. On average, men have been 0.43 years (SD=2.27) sick or disabled and 0.41 years (SD=2.00) unemployed or inactive. However compared to women, they spent only 0.03 years (SD=0.65) in domestic work and 0.21 years (SD=1.59) in part-time employment on average.

Figure 1a. Women: Late working life employment trajectories. Chronograms, n=10,913



Note: ASW=0.58; PBC=0.67; HG=0.89;
Cluster labels:
(1) FTE & R65: Full-time employed and retirement around age 65,
(2) FTE & R55: Full-time employed and retirement around age 55,
(3) FTE & R50: Full-time employed and retirement around age 50,
(4) DW: Domestic work, (5) FTSE: Full-time self-employed,
(6) PTE: Part-time employed, (7) SD: Sick or disabled,
(8) UI: Unemployed or inactive;

Figure 1b. Men: Late working life employment trajectories. Chronograms, n=10,614



Note: ASW=0.55; PBC=0.52; HG=0.87;
Cluster labels:
(1) FTE & R65: Full-time employed and retirement around age 65,
(2) FTE & R55: Full-time employed and retirement around age 55,
(3) FTE & R50: Full-time employed and retirement around age 50,
(4) FTE & R58: Full-time employed and retirement around age 58,
(5) FTSE: Full-time self-employed, (6) PTE: Part-time employed,
(7) SD: Sick or disabled, (8) UI: Unemployed or inactive;

2.5.2 Distributions of trajectories by family history

Women. Table 1a presents the distribution of the previously identified clusters in Figure 1a by coresidential partnership and parenthood history. Women who have mainly been without a partner and who have no children are frequently found in late working life trajectories characterized by full-time employment and later retirement. In contrast, single mothers, i.e., those without a partner and with children, are frequently found in full-time employment as well as the sick or disabled clusters. Their partnered childless counterparts often follow employment trajectories dominated by full-time employment, full-time self-employment and sickness or disablement. Lastly, women with a partner and children are typically found in domestic work and part-time employment. *Men*. Table 1b shows the distribution of the previously identified clusters in Figure 1b. Overall, there was little variation in the prevalence of coresidential partnership and having children between clusters. However, taken together, full-time employment applied mostly to men with both a partner and children.

2.5.3 Associations of trajectories with family history and welfare regimes

Women. Our *H2a* hypothesized that early family history increase the women's probability of being in domestic and part-time work. The average marginal effects (AME) from the multinomial regression analysis shown in Table 2a largely confirm this expectation. In model 1, years of coresidential partnership and average number of children between the ages of 25 to 49 years were positively related to the probability of being in domestic work and part-time employment in late working life but negatively related to the probability of being in full-time employment. The number of children is also positively associated with sickness or disablement and full-time self-employment. In contrast, having spent more years in a coresidential partnership relates to a lower likelihood of being sick or disabled.

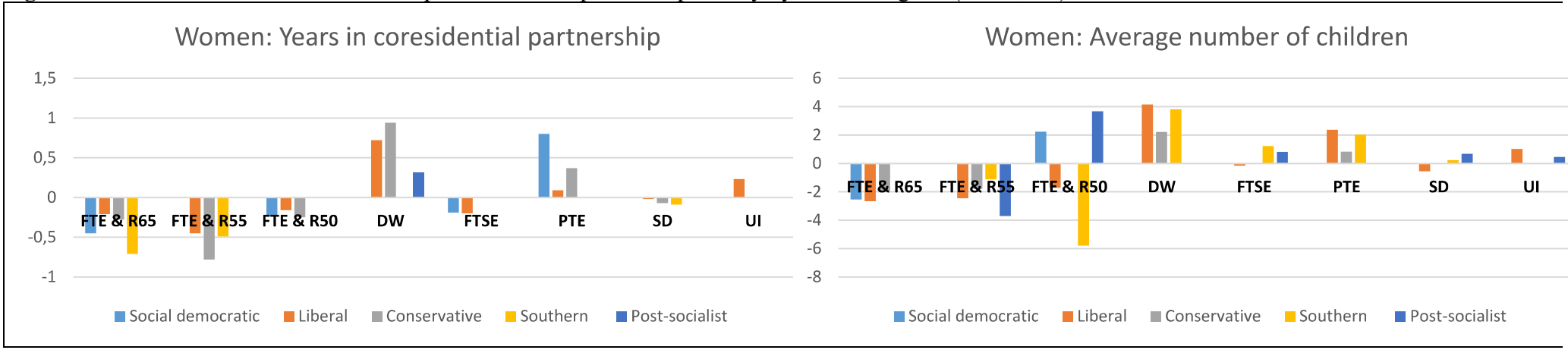
Our *H3* hypothesized more pronounced associations between parenthood history, partnership history and late-working life trajectories in welfare regimes that leave women to shoulder care responsibilities. The results in Model 2, which includes the interaction effects of welfare regimes and family history, yield support for this hypothesis. All significant interaction effects are depicted in Figure 2a. The associations between parenthood, coresidential partnership history and late-working life trajectories indeed vary by welfare regime and are strongest in the liberal, conservative and southern regimes. In the liberal, conservative and

southern regime, parenthood history is positively associated with domestic work and part-time employment. Partnership history is positively related to domestic work in liberal, conservative and post-socialist regimes. Whereas the association linking part-time employment and partnership history is strongest in social-democratic and conservative regimes. Having spent more years in a partnership in earlier life is negatively related to full-time employment in all regimes except the post-socialist regime. Those with a higher average number of children in earlier years are more likely in full-time employment in social democratic and post-socialist regimes and less likely in full-time employment especially in liberal, southern and conservative regimes. In the liberal and social democratic regime, women spending many years in a partnership are less likely to be full-time self-employed. Furthermore, women in the post-socialist and southern regime more likely to carry out full-time self-employment if they had many children.

Men. Table 2b reproduces the previous models for the population of men. Our *H2b* hypothesized that parenthood and partnership history increases the men's probability of working full-time. Again, the findings appear to support this notion. According to model 1, men with long partnership histories more likely follow trajectories of full-time employment and less likely in sickness or disability and unemployment. Men with many children are more often found in sickness and disability.

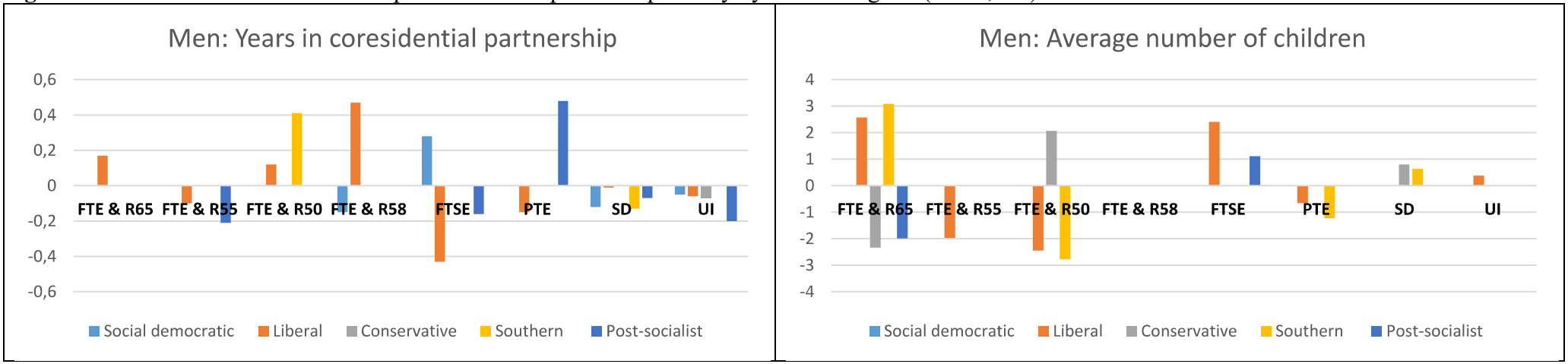
In line with our *H3*, these associations are particularly pronounced in welfare regimes that encourage the breadwinner-caretaker division. In model 2, especially in the liberal and the southern regime, men are more often engaged in full-time employment when they have spent many years in a coresidential partnership and have had a higher number of children. In the conservative regime, men with many children are more likely to be sick or disabled. All significant interaction effects are shown in Figure 2b.

Figure 2a. Women: Conditional-effects of parenthood and partnership history by welfare regime (n= 10,913)



Note: Only significant results are reported; Controls: divorce, adulthood health, childhood health, education, year of birth; Cluster labels: (1) FTE & R65: Full-time employed and retirement around age 65, (2) FTE & R55: Full-time employed and retirement around age 55, (3) FTE & R50: Full-time employed and retirement around age 50, (4) DW: Domestic work, (5) FTSE: Full-time self-employed, (6) PTE: Part-time employed, (7) SD: Sick or disabled, (8) UI: Unemployed or inactive;

Figure 2b. Men: Conditional-effects of parenthood and partnership history by welfare regime (n= 10,614)



Note: Only significant results are reported; Controls: divorce, adulthood health, childhood health, education, year of birth; Cluster labels: (1) FTE & R65: Full-time employed and retirement around age 65, (2) FTE & R55: Full-time employed and retirement around age 55, (3) FTE & R50: Full-time employed and retirement around age 50, (4) FTE & R58: Full-time employed and retirement around age 58, (5) FTSE: Full-time self-employed, (6) PTE: Part-time employed, (7) SD: Sick or disabled, (8) UI: Unemployed or inactive;

2.6 Discussion

This study employed a life course perspective to explore gender-specific late working life trajectories, and to explain them in relation to earlier family history and how they vary by welfare regimes. Gaining knowledge on how late working life patterns and its determinants differ for women and men, we aim to understand gender gaps in labor-market participation rates and how these gaps might be amplified or narrowed by welfare state orientations.

Using retrospective data from SHARELIFE and gender-separate sequence analyses, we found evidence that late working life histories differ dramatically by gender. In line with previous research (Komp-Leukkunen 2019), women's late employment histories are either characterized by paid (part- or full-time) work or domestic work, while men's late working life is mainly shaped by full-time work. This suggests that women decided between either paid or unpaid work, whereas the continuous normal employment biography mainly applies to men in our cohorts (Kohli 2007). However, prior research indicates that women in younger cohorts, which are not yet included in the SHARELIFE sample, are more successful at switching between paid and unpaid care work and therefore increase their labor market participation. A possible explanation is that cultural perceptions of gender arrangements as well as institutions (e.g. Discrimination Act at workplaces in Sweden) are changing (McMunn et al. 2015, Crossdale et al. 2022).

Moreover, in our study, late working life trajectories were associated with earlier family events in different ways among men and women. The average number of children over the years and years in a coresidential partnership were positively associated with unpaid domestic work or part-time work but negatively associated with full-time employment in later life in women. The same family events were not related or even inversely related to employment among men – i.e., there was a greater chance of full-time employment for partnered men. This supports the notion of the breadwinner-caretaker division showing that family events are more strongly related to women compared to men up until late working life – especially in southern and conservative welfare regimes (Killewald and García-Manglano 2016, Wahrendorf et al. 2018, Worts et al. 2016).

2.6.1 Theoretical implications

Our results underscore arguments from the *cumulative disadvantage theory* (Dannefer 2003). Early family events – such as childbirth and therefore care responsibilities – may be carried through life until older age and prevent women from following typical male employment trajectories in old age (Kohli 2007). Because these labor market disadvantages due to the care burden pertain almost exclusively to women, family events appear to be gender-specific, which stresses arguments from the literature on gendered life-courses (Levy and Widmer 2013, Moen 2001, Holman and Walker 2020). Our findings indicate that women who had more care responsibilities and have spent more years in a coresidential partnership in earlier life may have decided to exit from the workforce or to work in part-time to balance work and care responsibilities, and continued this employment pattern up until late working life. We assume that women might have difficulties to follow continuous full-time employment trajectories once they have chosen to exit from the labor force due to care responsibilities in earlier life – in contrast to men. This also mirrors the *linked lives* approach, assuming that women and men within a partnership coordinate their work courses with each other to reconcile care and paid work: women shoulder care work whereas men take over the role of the breadwinner (Bengtson et al. 2016, Naegele and Walker 2021).

Moreover, our results support the *human capital theory* (Becker 1965) by showing that the impact of family history differs by welfare regimes suggesting that women's opportunities are dependent on the national context such as policies or societal norms (Möhring 2016, Fortin 2005, De Tavernier 2016). The previously discussed gender inequalities was particularly visible in *southern regimes* – characterized by a lack of public social infrastructure – and *conservative regimes* – which support continuous full-time employment as a standard for men but not necessarily for women. There was no such association in the *social democratic regime*, where women's late employment is almost unaffected by family history. This is likely the result of social-democratic policies that support flexible employment by combining paid work and childcare (Kuitto and Helmdag 2021). This mirrors previous results showing higher female labor market participation in northern Europe (Anttonen and Sipilä 1996, Anxo et al. 2006). However, our results regarding *post-socialist regimes* turned out to be mixed. An explanation might be that the countries in this regime differ in their degree of female labor market integration as a result of different social policy reforms (Möhring 2016): For example, as the only post-socialist country, Poland significantly restricted the role of the state in providing

social welfare and instead assigned the responsibility to individuals and their families – and therefore to women to shoulder family care (Steinhilber 2006).

Specifically, a strong association pertained to the *liberal regime*, represented by Switzerland. This finding connects well to previous evidence on the Swiss case, showing that women with a family history are more likely to be in long-term caring or unemployment (Madero-Cabib 2015, Madero-Cabib and Fasang 2016). An explanation for this finding is that Swiss policies tend to neglect workers that disrupt their employment career to look after family. We suggest that the Swiss case may be generalized to other liberal regimes. To assess the robustness of our findings, we compared the results from Switzerland with those from another liberal regime, namely the UK (Wahrendorf et al. 2018): A post-hoc analysis of the representative survey ELSA produced very similar results (Appendix Table 3, Figure 3). We therefore conclude that, especially in liberal regimes, mothers tend to pursue a career in part-time employment or domestic work, while fathers continue working full-time.

Besides, we find that both men and women with a higher average number of children over the years in earlier life are more likely sick or disabled. Previous studies found that having children is linked to less wealth in later life (Plotnick 2009) which in turn has been found to decrease health, for example because of less economic security and not being able to afford a healthier lifestyle (Pollack et al. 2007). Another possible explanation for this finding is that mothers who spent most of their earlier years as housewives instead of in paid work, lack health promoting opportunities such as social interaction, fulfillment at work or financial independence: Prior research has shown that women who spend most of their life in unpaid care work – compared to women who were mostly full-time employed – were more likely affected by disability and mortality in later life (Benson et al. 2017, Sabbath et al. 2015, Lahelma et al. 2002).

Another interesting finding is that women with more children in earlier life have a higher probability of being in full-time self-employment in later life. This reflects previous research which found that women with more family responsibilities chose to be self-employed. Self-employment might allow them to be more self-determined, flexible and therefore to better balance work and family care demands (Wellington 2006, Joona 2017).

Lastly, we found that women who have been divorced in earlier life and have a higher educational level, are more likely to be in full-time employment and less likely to be in domestic work in late working life. This reflects previous research (Dingemans and Möhring 2019,

Mäcken et al. 2022) and indicates, with regard to divorce, that women who lost their partner are forced to provide for themselves. Women with a higher educational level, on the other hand, might have a higher income and are therefore not dependent on their partner's income compared to lower educated women.

2.6.2 Limitations and suggestions for future research

Our study has several limitations. First, we measured childcare only indirectly through proxy indicators of parenthood history by assuming that the demand for care work increases with the number of children. Third, we observed spells of jobs and gaps between jobs that are at least 6+ months long, which might underestimate the complexity of late working life trajectories. Fourth, the data did not contain information concerning the mechanisms between family history and late employment: Family events might impact late working life through the loss of labor market expertise. Fifth, our findings cannot be completely generalized to younger cohorts that are starting a family nowadays – particularly because the traditional gendered division of paid and unpaid work is less strongly pronounced in younger generations (Meyer and Pfau-Effinger 2006). However, our results are still relevant for younger cohorts by showing the importance of national policy regimes for gendered opportunities to work longer. This is especially so because none of the countries included in this study have implemented any life-course oriented strategies yet to support women's employment troughout their life. Lastly, the use of welfare typologies blurrs differences across countries: Family policies may fit more than one regime type. Yet, further partitioning the data by country would have yielded small samples and low statistical power for our analyses. Moreover, factors such as cultural values and characteristics of the labor markets should be considered because employment is not just influenced by welfare regimes. More research is needed to better understand the gender-specific role of national contexts across the life course, including cultural norms and social policies, as well as the mechanisms linking family history and late employment.

Table 1a. Women: Distribution of late working life clusters by coresidential partnership and children history (n=10,913)

		Cluster									
		1 FTE & R65	**2 FTE & R55**	**3 FTE & R50**	**4 DW**	**5 FTSE**	**6 PTE**	**7 SD**	**8 UI**	Total	%
					%						
Mainly without coresidential partner	No children	12.4	8.9	5.0	1.2	4.0	2.0	6.4	2.7	543	5.0
	With children	12.5	11.6	9.6	6.7	4.5	7.9	13.2	8.9	1,181	10.8
Mainly with coresidential partner	No children	5.9	5.6	5.6	3.9	5.7	3.9	8.3	4.4	600	5.5
	With children	69.1	74.0	79.8	88.2	85.8	86.2	72.0	84.0	8,589	78.7
Total		1,537	2,222	3,315	1,750	508	928	304	349		
%		14.1	20.4	30.4	16.0	4.7	8.5	2.8	3.2		

Note: weighted; F=6.71; p=0.000; Cluster labels: (1) FTE & R65: Full-time employed and retirement around age 65, (2) FTE & R55: Full-time employed and retirement around age 55, (3) FTE & R50: Full-time employed and retirement around age 50, (4) DW: Domestic work, (5) FTSE: Full-time self-employed, (6) PTE: Part-time employed, (7) SD: Sick or disabled, (8) UI: Unemployed or inactive;

Table 1b. Men: Distribution of late working life clusters by coresidential partnership and children history (n=10,614)

		Cluster									
		1 FTE & R65	**2 FTE & R55**	**3 FTE & R50**	**4 FTE & R58**	**5 FTSE**	**6 PTE**	**7 SD**	**8 UI**	Total	%
					%						
Mainly without coresidential partner	No children	5.8	5.7	5.1	5.0	5.9	4.9	9.0	13.0	652	6.1
	With children	11.5	10.3	7.5	9.6	11.1	7.9	7.6	13.2	1,156	10.9
Mainly with coresidential partner	No children	5.6	5.0	5.1	5.4	6.3	6.6	1.7	8.9	617	5.8
	With children	77.1	79.0	82.4	80.0	76.7	80.6	81.7	65.0	8,189	77.2
Total		2,493	2,427	1,628	1,328	1,172	1,020	292	254		
%		23.5	22.9	15.3	12.5	11.1	9.6	2.8	2.4		

Note: weighted; F=1.60; *p < .05; Cluster labels: (1) FTE & R65: Full-time employed and retirement around age 65, (2) FTE & R55: Full-time employed and retirement around age 55, (3) FTE & R50: Full-time employed and retirement around age 50, (4) FTE & R58: Full-time employed and retirement around age 58, (5) FTSE: Full-time self-employed, (6) PTE: Part-time employed, (7) SD: Sick or disabled, (8) UI: Unemployed or inactive;

Table 2a. Women: Average marginal effects (AME) based on multinomial regression analysis in percent (n= 10,913)

	Cluster															
	M1 AME								M2 AME							
	1 FTE & R65	**2 FTE & R55**	**3 FTE & R50**	**4 DW**	**5 FTSE**	**6 PTE**	**7 SD**	**8 UI**	**1 FTE & R65**	**2 FTE & R55**	**3 FTE & R50**	**4 DW**	**5 FTSE**	**6 PTE**	**7 SD**	**8 UI**
Family history																
Coresidential partnership	-0.35***	-0.51***	-0.07	0.71***	0.03	0.25*	-0.11**	0.06	-0.35***	-0.52***	-0.07	0.70***	0.04	0.24**	-0.10**	0.07
Number of children	-1.64**	-1.94***	-0.44	2.01***	0.67***	1.04*	0.26*	0.03	-1.61***	-1.95***	-0.47	2.12***	0.70***	0.93***	0.27**	0.01
Regime *(Ref. Social democratic)*																
Liberal	-23.14***	-15.92*	-4.77	30.84***	2.70***	9.35	-0.77	1.72**	-22.97***	-16.89**	-4.90	31.11***	2.69***	9.78	-0.94	2.12**
Conservative	-25.07***	-1.35	4.46	17.88***	2.90*	-3.76	1.32*	3.63***	-25.65***	-1.35	4.61	17.88***	3.02*	-3.55	1.29*	3.74***
Southern	-18.81**	-4.97	10.23	23.31***	4.57***	-14.23*	-0.53	0.43	-19.73**	-4.92	9.92	23.84***	4.97***	-13.92*	-0.60	0.44
Post-socialist	-27.76***	-0.72	43.57***	-1.38	0.52	-18.65**	4.83	-0.41	-28.32***	-0.67	43.22***	-1.14	0.94	-18.33**	4.79	-0.49
Regime* Coresidential partnership																
Social democratic	-	-	-	-	-	-	-	-	-0.45**	0.02	-0.23***	0.05	-0.19*	0.80***	-0.04	0.04
Liberal	-	-	-	-	-	-	-	-	-0.21***	-0.45***	-0.16***	0.72***	-0.20***	0.09***	-0.02***	0.23***
Conservative	-	-	-	-	-	-	-	-	-0.28**	-0.78***	-0.25*	0.94**	0.11	0.37**	-0.07***	-0.03
Southern	-	-	-	-	-	-	-	-	-0.71***	-0.49***	0.17	0.67	0.11	0.06	-0.09***	0.28
Post-socialist	-	-	-	-	-	-	-	-	-0.08	-0.05	0.13	0.31**	-0.14	-0.04	-0.17	0.05
Regime*Number of children																
Social democratic	-	-	-	-	-	-	-	-	-2.55*	-0.26	2.24**	0.49	0.29	-0.48	0.29	-0.02
Liberal	-	-	-	-	-	-	-	-	-2.66***	-2.46***	-1.72***	4.15***	-0.16**	2.38***	-0.55***	1.02***
Conservative	-	-	-	-	-	-	-	-	-1.92***	-1.79***	0.29	2.22***	0.39	0.84***	0.13	-0.16
Southern	-	-	-	-	-	-	-	-	-0.27	-1.12***	-5.80***	3.81***	1.23***	2.03*	0.24***	-0.12
Post-socialist	-	-	-	-	-	-	-	-	-1.98	-3.70**	3.67*	-0.00	0.82**	0.06	0.67***	0.46***

Note: weighted; robust cluster estimator (countries); *p < .05; **p < .01; ***p < .001; Base category: Cluster 1; Controls: divorce, adulthood health, childhood health, education, year of birth; Cluster labels: (1) FTE & R65: Full-time employed and retirement around age 65, (2) FTE & R55: Full-time employed and retirement around age 55, (3) FTE & R50: Full-time employed and retirement around age 50, (4) DW: Domestic work, (5) FTSE: Full-time self-employed, (6) PTE: Part-time employed, (7) SD: Sick or disabled, (8) UI: Unemployed or inactive

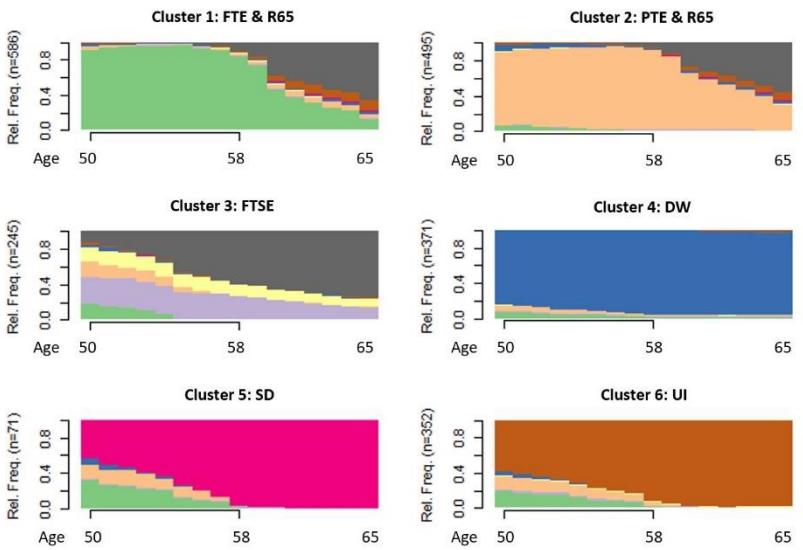
Table 2b. Men: Average marginal effects (AME) based on multinomial regression analysis in percent (n= 10,614)

	Cluster															
	M1 AME								M2 AME							
	1 FTE & R65	**2 FTE & R55**	**3 FTE & R50**	**4 FTE & R58**	**5 FTSE**	**6 PTE**	**7 SD**	**8 UI**	**1 FTE & R65**	**2 FTE & R55**	**3 FTE & R50**	**4 FTE & R58**	**5 FTSE**	**6 PTE**	**7 SD**	**8 UI**
Family history																
Coresidential partnership	-0.12	-0.13	0.23**	0.01	-0.10	0.30	-0.10*	-0.09***	-0.15	-0.15	0.25**	-0.00	-0.10	0.31*	-0.06	-0.09***
Number of children	-0.52	0.23	0.26	-0.41	0.38	-0.46	0.60*	-0.08	-0.44	0.38	0.11	-0.34	0.34	-0.47**	0.53**	-0.10
Regime *(Ref. Social democratic)*																
Liberal	0.14	1.77	-2.40	-1.09	6.17***	-4.49***	0.59**	-0.70	0.45	1.55	-2.67	-0.79	6.09***	-4.57***	0.61***	-0.66
Conservative	-21.69**	7.74	10.57	-3.03	3.50**	1.45	0.69***	0.75	-21.81**	7.69	10.66	-3.02	3.44**	1.53	0.78***	0.72
Southern	-11.44	-0.72	5.70	-4.64***	5.56	6.09*	-0.38	-0.18	-11.46	-0.84	5.74	-4.67***	5.42	6.26*	-0.31	-0.14
Post-socialist	-18.29*	6.73	5.91	-3.22	-3.96	6.11**	5.68*	1.04	-18.28*	6.74	6.02	-3.29	-4.15*	5.93**	6.08*	0.95
Regime*Coresi-dential *partnership*																
Social democratic	-	-	-	-	-	-	-	-	0.24	-0.01	-0.14	-0.15***	0.28*	-0.05	-0.12***	-0.05***
Liberal	-	-	-	-	-	-	-	-	0.17***	-0.10**	0.12***	0.47***	-0.43***	-0.15***	-0.01*	-0.06***
Conservative	-	-	-	-	-	-	-	-	-0.12	-0.07	0.27	-0.03	-0.15	0.11	0.05	-0.07***
Southern	-	-	-	-	-	-	-	-	-0.38	-0.25	0.41***	-0.05	-0.08	0.55	-0.13***	-0.08
Post-socialist	-	-	-	-	-	-	-	-	0.00	-0.21*	-0.03	0.20	-0.16*	0.48**	-0.07*	-0.20***
Regime* Number of children																
Social democratic	-	-	-	-	-	-	-	-	-0.90	1.55	0.38	-0.61	1.22	-0.89	0.41	-1.17
Liberal	-	-	-	-	-	-	-	-	2.57***	-1.97***	-2.45***	-0.22	2.41***	-0.66***	-0.07	0.38***
Conservative	-	-	-	-	-	-	-	-	-2.34***	-0.20	2.07*	-0.39	0.78	-0.15	0.80***	-0.57
Southern	-	-	-	-	-	-	-	-	3.09***	0.89	-2.78**	0.02	-0.85	-1.23***	0.64***	0.25
Post-socialist	-	-	-	-	-	-	-	-	-1.99*	0.30	0.99	-0.09	1.11**	0.28	-0.29	0.54

Note: weighted; robust cluster estimator (countries); *p < .05; **p < .01; ***p < .001; Base category: Cluster 1; Controls: divorce, adulthood health, childhood health, education, year of birth; Cluster labels: (1) FTE & R65: Full-time employed and retirement around age 65, (2) FTE & R55: Full-time employed and retirement around age 55, (3) FTE & R50: Full-time employed and retirement around age 50, (4) FTE & R58: Full-time employed and retirement around age 58, (5) FTSE: Full-time self-employed, (6) PTE: Part-time employed, (7) SD: Sick or disabled, (8) UI: Unemployed or inactive;

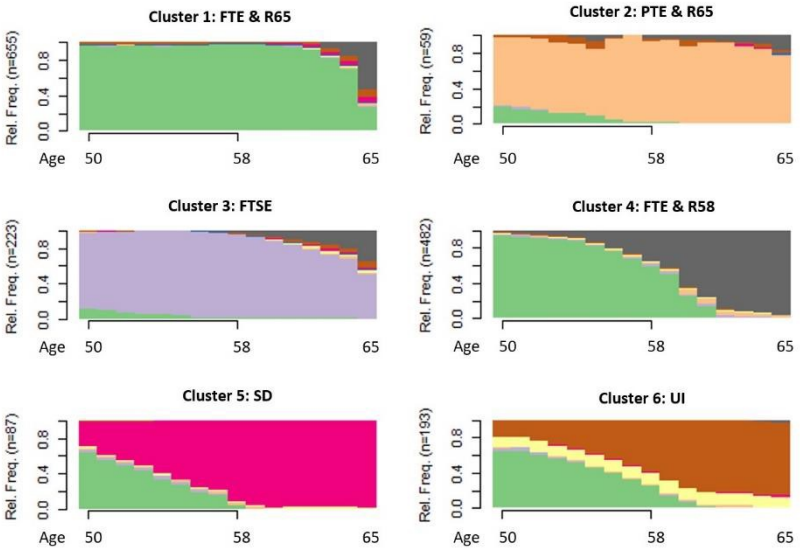
Figure 3. Robustness checks using ELSA: Late working life employment trajectories; Chronograms.

Women (n=2,120)



Note: ASW=0.57; PBC=0.81; HG=0.94; Cluster labels: (1) FTE & R65: Full-time employment and retirement around 65, (2) PTE & R65: Part-time employment and retirement around 65, (3) FTSE: Full-time self-employment, (4) DW: Domestic work, (5) SD: Sick or disabled, (6) UI: Unemployed or inactive

Men (n=1,699)



Note: ASW=0.52; PBC=0.66; HG=0.84; Cluster labels: (1) FTE & R65: Full-time employment and retirement around 65, (2) PTE & R65: Part-time employment and retirement around 65, (3) FTSE: Full-time self-employment, (4)FTE & R58: Full-time employment and retirement around 58, (5) SD: Sick or disabled, (6) UI: Unemployed or inactive

Table 3. Average marginal effects (AME) based on multinomial regression analysis in percent

	Women (n=2,120)						**Men** (n=1,699)					
	Cluster											
	AME						AME					
	1 FTE & R65	**2 PTE & R65**	**3 FTSE**	**4 DW**	**5 SD**	**6 UI**	**1 FTE & R65**	**2 PTE & R65**	**3 FTSE**	**4 FTE & R58**	**5 SD**	**6 UI**
Coresidential partnership	-0.91***	0.66***	-0.15	0.35*	-0.16**	0.22	-0.09	-0.04	0.12	0.53**	-0.20**	-0.32**
Number of children	-0.97	0.55	-1.3*	1.95**	0.87**	-1.08	0.66	-0.10	0.22	-2.68*	0.34	1.57*

Cluster labels: (1) FTE & R65: Full-time employment and retirement around 65, (2) PTE & R65: Part-time employment and retirement around 65, (3) FTSE: Full-time self-employment, (4) DW: Domestic work, (5) SD: Sick or disabled, (6) UI: Unemployed or inactive

Cluster labels: (1) FTE & R65: Full-time employment and retirement around 65, (2) PTE & R65: Part-time employment and retirement around 65, (3) FTSE: Full-time self-employment, (4)FTE & R58: Full-time employment and retirement around 58, (5) SD: Sick or disabled, (6) UI: Unemployed or inactive

Note: weighted; *p < .05; **p < .01; ***p < .001; Base category: Cluster 1.

2.8 References

Abendroth A-K, Huffman ML, Treas J (2014) The parity penalty in life course perspective. Am Sociol Rev 79(5):993–1014. doi: 10.1177/0003122414545986

Aisenbrey S, Fasang AE (2010) New life for old ideas: the "second wave" of sequence analysis bringing the "course" back into the life course. Sociol Methods Res 38(3):420–462. doi: 10.1177/0049124109357532

Anttonen A, Sipilä J (1996) European social care services: is it possible to identify models? J Eur Soc Policy 6(2):87–100. doi: 10.1177/095892879600600201

Anxo D, Fagan C, Cebrian I, Moreno G (2006) Patterns of labour market integration in Europe - a life course perspective on time policies. Socioecon Rev 5(2):233–260. doi: 10.1093/ser/mwl019

Arts WI, Gelissen J (2002) Three worlds of welfare capitalism or more? A state-of-the-art report. J Eur Public Policy 12(2):137–158. doi: 10.1177/0952872002012002114

Banks, J., Institute for Fiscal Studies, Phelps, A., Taylor Nelson Sofres, Oskala, A., NatCen Social Research, Steptoe, A., UCL, Blake, M., NatCen Social Research, Oldfield, Z., Institute for Fiscal Studies, Marmot, M., University College London, Department of Epidemiology and Public Health, Clemens, S., NatCen Social Research, Rogers, N., University College London, UCL Research Department of Epidemiology and Public Health, Nazroo, J., University College London, Department of Epidemiology and Public Health (2021) English Longitudinal Study of Ageing: Waves 0-9, 1998-2019. UK Data Service

Becker GS (1965) A theory of the allocation of time. Econ J 75(299):493. doi: 10.2307/2228949

Bengtson VL, Elder GH, Putney NM (2016) The lifecourse perspective on ageing: linked lives, timing, and history. In: Johnson ML, Bengtson VL, Coleman PG, Kirkwood TBL (eds) The Cambridge Handbook of Age and Ageing. Cambridge University Press, pp 493–501

Bennett J, Möhring K (2015) Cumulative (dis)advantage? The impact of labour market policies on late career employment from a life course perspective. J. Soc. Pol. 44(2):213–233. doi: 10.1017/S0047279414000816

Benson R, Glaser K, Corna LM, Platts LG, Di Gessa G, Worts D, Price D, McDonough P, Sacker A (2017) Do work and family care histories predict health in older women? Eur J Public Health 27(6):1010–1015. doi: 10.1093/eurpub/ckx128

Bergmann M, Kneip T, De Luca G, Scherpenzeel A (2019a) Survey participation in the Survey of Health, Ageing and Retirement in Europe (SHARE). Wave 1-7. Based on Relelase 7.0.0. SHARE Working Paper Series 41-2019. SHARE-ERIC, Munich

Bergmann M, Scherpenzeel A, Börsch-Supan A (2019b) SHARE Wave 7 methodology: panel innovations and life histories, Munich: Munich Center for the Economics of Aging (MEA)

Bertogg A, Nazio T, Strauss S (2021) Work–family balance in the second half of life: caregivers' decisions regarding retirement and working time reduction in Europe. Soc Policy Adm 55(3):485–500. doi: 10.1111/spol.12662

Bonoli G, Kato J (2004) Social policies in Switzerland and Japan: managing change in liberal-conservative welfare states. Swiss Political Sci Rev 10(3):211–232. doi: 10.1002/j.1662-6370.2004.tb00037.x

Börsch-Supan A (2022) Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 7. Release version: 8.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w7.800

Börsch-Supan A, Brandt M, Hunkler C, Kneip T, Korbmacher J, Malter F, Schaan B, Stuck S, Zuber S (2013) Data resource profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). Int J Epidemiol 42(4):992–1001. doi: 10.1093/ije/dyt088

Brandt M, Kaschowitz J, Quashie NT (2022) Socioeconomic inequalities in the wellbeing of informal caregivers across Europe. Aging Ment Health 26(8):1589–1596. doi: 10.1080/13607863.2021.1926425

Buchholz S, Hofacker D, Mills M, Blossfeld H-P, Kurz K, Hofmeister H (2008) Life courses in the globalization process: the development of social inequalities in modern societies. Eur Sociol Rev 25(1):53–71. doi: 10.1093/esr/jcn033

Crossdale R, Foster L, Walker A (2022) Comparative report on the national policies and political-economic context of Germany, Poland, Sweden, and the UK. Rapporter från Åldrande och social förändring, vol 8. Linköping University Electronic Press, Linköping

Dannefer D (2003) Cumulative advantage/disadvantage and the life course: cross-fertilizing age and social science theory. J Gerontol B Psychol Sci Soc Sci 58(6):S327-37. doi: 10.1093/geronb/58.6.S327

De Tavernier W (2016) The family as provider of welfare: the role of gender and the family in welfare opinions, preferences, actions and outcomes. Aalborg University Press

Dewilde C (2003) A life-course perspective on social exclusion and poverty. Br J Sociol 54(1):109–128. doi: 10.1080/0007131032000045923

Dingemans E, Möhring K (2019) A life course perspective on working after retirement: what role does the work history play? Adv Life Course Res 39:23–33. doi: 10.1016/j.alcr.2019.02.004

Ehrlich U, Möhring K, Drobnič S (2020) What comes after caring? The impact of family care on women's employment. J Fam Issues 41(9):1387–1419. doi: 10.1177/0192513X19880934

Elder GH, Johnson MK, Crosnoe R (2003) The emergence and development of life course theory. In: Kaplan HB, Mortimer JT, Shanahan MJ (eds) Handbook of the life course. Springer US, Boston, MA, pp 3–19

Esping-Andersen G (1990) The three worlds of welfare capitalism. Princeton University Press, Princeton, NJ

Fasang AE (2010) Retirement: institutional pathways and individual trajectories in Britain and Germany. Sociol Res Online 15(2):1–16. doi: 10.5153/sro.2110

Fortin NM (2005) Gender role attitudes and the labour-market outcomes of women across OECD countries. Oxf Rev Econ Policy 21(3):416–438. doi: 10.1093/oxrep/gri024

Foster L, Walker A (2013) Gender and active ageing in Europe. Eur J Ageing 10(1):3–10. doi: 10.1007/s10433-013-0261-0

Holman D, Walker A (2020) Understanding unequal ageing: towards a synthesis of intersectionality and life course analyses. Eur J Ageing:1–17. doi: 10.1007/s10433-020-00582-7

Hoven H, Dragano N, Blane D, Wahrendorf M (2018) Early adversity and late life employment history—a sequence analysis based on SHARE. Work Aging Retire 4(3):238–250. doi: 10.1093/workar/wax014

Hyde M, Dingemans E (2017) Hidden in plain sight? Does stricter employment protection legislation lead to an increased risk of hidden unemployment in later life? Work Aging Retire 3(3):231–242. doi: 10.1093/workar/wax013

Joona PA (2017) Are mothers of young children more likely to be self-employed? The case of Sweden. Rev Econ Household 15(1):307–333. doi: 10.1007/s11150-016-9349-6

Killewald A, García-Manglano J (2016) Tethered lives: a couple-based perspective on the consequences of parenthood for time use, occupation, and wages. Soc Sci Res 60:266–282. doi: 10.1016/j.ssresearch.2016.03.007

Kohli M (2007) The institutionalization of the life course: looking back to look ahead. Res Hum Dev 4(3-4):253–271. doi: 10.1080/15427600701663122

Komp-Leukkunen K (2019) Capturing the diversity of working age life-courses: a European perspective on cohorts born before 1945. PloS one 14(2):e0212400. doi: 10.1371/journal.pone.0212400

König S (2017) Career histories as determinants of gendered retirement timing in the Danish and Swedish pension systems. Eur J Ageing 14(4):397–406. doi: 10.1007/s10433-017-0424-5

Kuitto K, Helmdag J (2021) Extending working lives: how policies shape retirement and labour market participation of older workers. Soc Policy Adm 55(3):423–439. doi: 10.1111/spol.12717

Lacey R, Stafford M, Sacker A, McMunn A (2016) Work-family life courses and subjective wellbeing in the MRC National Survey of Health and Development (the 1946 British birth cohort study). J Popul Ageing 9:69–89. doi: 10.1007/s12062-015-9126-y

Lahelma E, Arber S, Kivelä K, Roos E (2002) Multiple roles and health among British and Finnish women: the influence of socioeconomic circumstances. Soc Sci Med 54(5):727–740. doi: 10.1016/s0277-9536(01)00105-8

Lalive R, Zweimüller J (2009) How does parental leave affect fertility and return to work? Evidence from two natural experiments. Q J Econ 124(3):1363–1402. doi: 10.1162/qjec.2009.124.3.1363

Levy R, Widmer ED (2013) Gendered life courses between standardization and individualization. A European approach applied to Switzerland. [Gender-Diskussion, Bd. 18]. Lit, Zürich, Berlin

Lewis J (1992) Gender and the development of welfare regimes. J Eur Public Policy 2(3):159–173. doi: 10.1177/095892879200200301

Lynch J (2006) Age in the welfare state. Cambridge University Press, Cambridge

Mäcken J, Präg P, Hess M, Ellwardt L (2022) Educational inequalities in labor market exit of older workers in 15 European countries. J Soc Pol 51(2):435–459. doi: 10.1017/S0047279421000258

Madero-Cabib I (2015) The life course determinants of vulnerability in late careers. LLCS 6(1):88–106. doi: 10.14301/llcs.v6i1.299

Madero-Cabib I, Fasang AE (2016) Gendered work–family life courses and financial well-being in retirement. Adv Life Course Res 27:43–60. doi: 10.1016/j.alcr.2015.11.003

Madero-Cabib I, Gauthier J-A, Le Goff J-M (2015) The Influence of interlocked employment–family trajectories on retirement timing. Work Aging and Retire 2(1):38-53. doi: 10.1093/workar/wav023

Mayer KU (2004) Whose lives? How history, societies, and institutions define and shape life courses. Res Hum Dev 1(3):161–187. doi: 10.1207/s15427617rhd0103_3

Mayer KU (2009) New directions in life course research. Annu Rev Sociol 35(1):413–433. doi: 10.1146/annurev.soc.34.040507.134619

McMunn A, Lacey R, Worts D, McDonough P, Stafford M, Booker C, Kumari M, Sacker A (2015) De-standardization and gender convergence in work–family life courses in Great Britain: a multi-channel sequence analysis. Advances in Life Course Research 26:60–75. doi: 10.1016/j.alcr.2015.06.002

Meyer T, Pfau-Effinger B (2006) Gender arrangements and pension systems in Britain and Germany: tracing change over five decades. Int J Ageing Later Life 1(2):67–110. doi: 10.3384/ijal.1652-8670.061267

Moen P (2001) The gendered life course. In: Handbook of aging and the social sciences. Editors, Robert H. Binstock and Linda K. George ; associate editors, Victor W. Marshall, Angela M. O'Rand, and James H. Schultz, 5th edition. Academic Press, San Diego, pp 179–196

Möhring K (2016) Life course regimes in Europe: individual employment histories in comparative and historical perspective. J Eur Soc Policy 26(2):124–139. doi: 10.1177/0958928716633046

Naegele G, Walker A (2021) EIWO`s Theoretical perspectives. EIWO working paper no. 1. http://liu.diva-portal.org/smash/get/diva2:1615512/FULLTEXT01.pdf

Obinger H, Starke P, Moser J, Bogedan C, Gindulis E, Leibfried S (2010) Switzerland: From liberal to conservative welfare state — a pattern of late maturation? In: Obinger H, Starke P, Moser J, Bogedan C, Gindulis E, Leibfried S (eds) Transformations of the welfare state. Oxford University Press, pp 191–244

Plotnick RD (2009) Childlessness and the economic well-being of older Americans. J Gerontol B Psychol Sci Soc Sci 64(6):767–776. doi: 10.1093/geronb/gbp023

Pollack CE, Chideya S, Cubbin C, Williams B, Dekker M, Braveman P (2007) Should health studies measure wealth? A systematic review. Am J Prev Med 33(3):250–264. doi: 10.1016/j.amepre.2007.04.033

Sabbath EL, Guevara IM, Glymour MM, Berkman LF (2015) Use of life course work-family profiles to predict mortality risk among US women. Am J Public Health 105(4):e96-e102. doi: 10.2105/AJPH.2014.302471

Settersten RA (2015) Relationships in time and the life course: the Significance of linked lives. Research in Human Development 12(3-4):217–223. doi: 10.1080/15427609.2015.1071944

Slukhai S, Borshchenko T (2019) Social welfare dynamics in post-socialist countries: unveiling the secrets of success. pse 43(2):167–194. doi: 10.3326/pse.43.2.3

Stafford M, Lacey R, Murray E, Carr E, Fleischmann M, Stansfeld S, Xue B, Zaninotto P, Head J, Kuh D, McMunn A (2019) Work-family life course patterns and work participation in later life. Eur J Ageing 16(1):83–94. doi: 10.1007/s10433-018-0470-7

Steinhilber S (2006) Gender and post-socialist welfare states in Central Eastern Europe: family policy reforms in Poland and the Czech Republic compared. In: Razavi S, Hassim S (eds) Gender and Social Policy in a Global Context. Palgrave Macmillan UK, London, pp 68–86

Studer M (2013) WeightedCluster library manual: a practical guide to creating typologies of trajectories in the social sciences with R. https://cran.r-project.org/web/packages/WeightedCluster/vignettes/WeightedCluster.pdf

Studer M, Ritschard G (2016) What matters in differences between life trajectories: a comparative review of sequence dissimilarity measures. J R Stat Soc A 179(2):481–511. doi: 10.1111/rssa.12125

Toczek L, Bosma H, Peter R (2022) Early retirement intentions: the impact of employment biographies, work stress and health among a baby-boomer generation. Eur J Ageing. doi: 10.1007/s10433-022-00731-0

Wahrendorf M, Zaninotto P, Hoven H, Head J, Carr E (2018) Late life employment histories and their association with work and family formation during adulthood: a sequence analysis based on ELSA. J Gerontol B Psychol Sci Soc Sci 73(7):1263–1277. doi: 10.1093/geronb/gbx066

Wellington AJ (2006) Self-employment: the new solution for balancing family and career? Labour Econ 13(3):357–386. doi: 10.1016/j.labeco.2004.10.005

Worts D, Corna L, Sacker A, McMunn A, McDonough P (2016) Understanding older adults' labour market trajectories: a comparative gendered life course perspective. LLCS 7(4). doi: 10.14301/llcs.v7i4.389

3. Do Covid-19 Containment Measures Reshape Late Working Life in Europe in the Mid-Term? Insights from the Second Share Corona Survey

3.1 Abstract

The post-pandemic consequences of Covid-19 for the labor market participation are yet to be examined. The Covid-19 Pandemic stands out from other crises due to the diverse measures implemented to control the virus's spread, which contributed to widespread unemployment. Older workers are a particularly vulnerable population because re-employment becomes increasingly challenging for them once they become unemployed (e.g. skill deterioration). Eventually, they may opt to leave the workforce completely (e.g. retirement, being a homemaker). The article combined individual-level data from SHARE with data on Covid-19 containment measures on the country level from the European Centre for Disease Prevention and Control (n=9,186). It calculated the individual exposure (in weeks) to different containment measures and examined how they are associated with employment after 18 months. The findings reveal that the mid-term consequences of containment measures for the employment participation of older workers vary based on the type of measure employed. Specifically, the closure of childcare facilities and non-essential shops has the most adverse impact on employment, particularly among women. Policymakers still need to address the mid-term consequences (e.g. workforce losses) resulting from earlier Covid-19 containment measures. Past measures continue to impact the employment of older workers 1.5 years after the onset of the Pandemic.

3.2 Introduction

Labor markets are prone to disruptions due to crises, such as the Great Recession (2007-2009) or more recently the Covid-19 Pandemic. These so-called shocks demonstrate a lasting adverse impact on employment and work courses well beyond the crisis itself (Johnson and Butrica 2012, Neumark and Button 2014). Still, the post-pandemic consequences for labor market participation are yet to be thoroughly examined. Unlike previous shocks, the Covid-19 Pandemic stands out because of its global and all-compassing impact on people's health and lives but also due to its unique patterns in its effect on the labor market. Furthermore, the Covid-19 Pandemic distinguishes itself from other crises, as the various measures taken by governments to contain the spread of the virus (e.g. stay-at-home orders, closures of daycare, cafés, and restaurants), immensely affected people's ability to pursue their work regularly. This included not being able to get to and from work, the workplace either having to shut down or workers being asked to work from home or professional care no longer being available, resulting in a work-care conflict. Consequently, stricter lockdown policies lead to more widespread unemployment (Ang and Dong 2022, ILO 2021, OECD 2020b, Theodoropoulos and Voucharas 2023).

Due to health and employment risks, aging societies in particular are at further risk, while already being challenged by a growing shortage of skilled workers and the rising costs of pensions and health care (Naegele 2021). Even though older workers are generally less likely to be affected by job loss due to their seniority when compared to younger workers during labor market shocks (Johnson and Butrica 2012), they constitute a particularly vulnerable population during the Pandemic (Chłoń-Domińczak et al. 2023). This is not only evident due to higher mortality and health risks in case of an infection but also because older workers face a higher risk of prolonged unemployment, due to discrimination in re-employment, obsolete digital skills or health restrictions (Brugiavini et al. 2023, Johnson and Butrica 2012, Neumark and Button 2014, Turek and Henkens 2020). Consequently, discontinuities in late working life – which is understood as labor market participation beyond age 50 – due to containment measures may produce negative permanent effects that result in earlier retirement or in extended periods of involuntary unemployment in higher age, or opting to become a homemaker. Furthermore, these effects might vary due to the different lengths and types of the lockdowns older workers experience (Brugiavini et al. 2023).

Older women may in particular experience a more pronounced impact from containment measures compared to men (Brugiavini et al. 2022, Fana et al. 2020, Moehring et al. 2021,

Schmitz et al. 2022). The closure of childcare facilities, implementation of stay-at-home orders, and travel restrictions collectively result in a decreased availability of professional care services. This situation heightens the demand for unpaid care work, such as caring for grandchildren and older parents. These additional caregiving burdens, primarily shouldered by women in later life (Schmitz et al. 2023), may contribute to some leaving their jobs and prolonged unemployment due to the challenges of balancing employment with caregiving responsibilities (Bratti et al. 2018, Ehrlich and Klaus 2023, Kelle 2020, Power 2020, Schmitz et al. 2022). Moreover, due to gendered labor market segregation and gendered employment trajectories (Schrover et al. 2007), women are more frequently in employment positions (e.g. retail trade and hospitality) that are more exposed to containment measures such as the closure of cafés, restaurants and non-essential shops (Brugiavini et al. 2022, OECD 2020c).

This research advances existing studies through four key avenues. Firstly, this is the first study that differentiates between various containment measures (e.g. stay-home-order, childcare facility closure, workplace closures, closure of public transport, etc.) by comparing their impact on employment among older workers. From a policy standpoint, it's imperative to understand which type of containment measure impedes older workers from prolonging their employment. For instance, if a substantial percentage of the detrimental impact on employment is caused by the shutdown of daycare facilities, future crises management should implement measures to minimise the closure of daycare centres to avoid much of the negative impact on labor supply of older workers.

Yet, previous studies mostly tend to limit their examination of containment measures to one composite metric which summarises the stringency of various, partly very different, containment measures (Ang and Dong 2022, Theodoropoulos and Voucharas 2023). Other earlier research does not include containment measures in their analysis at all and instead proceeds to solemnly investigate changes in retirement decisions before and during the Pandemic or patterns of work interruptions and job loss in the midst of the Pandemic (Bassoli et al. 2023, Brugiavini et al. 2022, Goda et al. 2023, Kung et al. 2023).

Secondly, the present investigation provides insights into the gendered impact of different containment measures on older worker's employment participation. Due to gendered work-courses women's labor market participation differs from those of men (Schmitz et al. 2023). The unequal distribution of care work leads to higher challenges among women as some of the containment measures affect the availability of care. Moreover, women are more frequently employed in sectors that are closed during stringent mitigation measures (e.g. hospitality, retail) (OECD 2020c). Therefore, an investigation that examines how various types

of containment measures are affecting older women's and men's employment participation differently is needed.

Thirdly, this investigation contributes to existing research by exploring mid-term consequences of the Covid-19 Pandemic, specifically by investigating how containment measures influence employment over an 18-month duration. The majority of research focuses on the short-term consequences of the Pandemic (Brugiavini et al. 2022, Bui et al. 2020, Engstler et al. 2023, Moehring et al. 2021). Gaining insights into the mid-term effects of containment measures contributes to a fuller comprehension of their overall impact. Research indicates that the short- and mid-term consequences of containment measures differ considerably (Börsch-Supan et al. 2023, Theodoropoulos and Voucharas 2023). In addition, occupational disruptions in later life can lead to lasting labor market exclusion and have negative implications on older worker's health and overall well-being (Murdock et al. 2021, Rotenberg et al. 2021).

Fourth, by including a broader range of employment statuses in later life (e.g. unemployment, retirement, homemaker, etc.) this study provides a more complete picture of the lasting consequences of Covid-19 containment measures for employment patterns in later working life. While short-term job loss, work interruptions or unemployment claims have been prone to investigation (Brugiavini et al. 2022, Kong and Prinz 2020), the knowledge of the relationship between Covid-19 containment measures and transitions into inactive unemployment such as retirement or becoming a homemaker is relatively scarce (Brugiavini et al. 2023).

Taken together, this is the first study that examines how the duration of various containment measures (March 2020 to August 2021) differ in their mid-term impact on the employment status of older workers aged 50 years and older: Which containment measures impact late-working life over the mid-term, and how does this association differ between men and women? By combining individual-level data from the second SHARE Corona Survey with country-level information from the European Centre for Disease Prevention and Control, this article takes advantage of the substantial heterogeneity in the duration of different containment measures across European countries. This unique dataset allows the examination of respondents' exposure to different policy responses and how this exposure impacts their employment status.

3.3 Theory and evidence

The Covid-19 Pandemic coupled with its measures to contain the spread of the virus is a highly unprecedented event that acts as a significant shock to the careers of older workers. A *career shock* can be defined as 'a disruptive and extraordinary event that is, at least to some degree, caused by factors outside the focal individual's control and that triggers a deliberate thought process concerning one's career' (Akkermans et al. 2018). Drawing on *event system theory*, it is assumed that events like the Covid-19 Pandemic generate disruptions such as sudden job loss, increasing unpaid care responsibilities or the shift to remote work, prompting individuals to reevaluate their career perspectives (Morgeson et al. 2015). This reassessment of one's career may result in different mid-term career choices such as earlier retirement or exiting employment to take over unpaid care duties as a homemaker.

3.3.1 Unemployment scarring

Individual's who experienced unemployment are more vulnerable to the possibility of future joblessness, commonly referred to as *unemployment scarring* (Arulampalam et al. 2001, Filomena 2023). The experience of job loss due to Covid-19 containment measures has the potential to leave lasting *scars*. Thus, older workers who lost their jobs due to prolonged mitigation measures such as workplace closures may face increasing difficulties to find new employment. Scarring following job loss may occur due to decreased health conditions, diminished individual motivation and skill deterioration (e.g. less work experience and computer proficiency), especially concerning the leap in digitalization during the Pandemic, which hampers re-employment (Hershbein and Kahn 2018, König and Seifert 2022, Murdock et al. 2021, Pit et al. 2021, Turek and Henkens 2020). Furthermore, age discrimination, which heightened during the Pandemic (Ayalon et al. 2021), adds to the challenges of older workers reentering employment after experiencing unemployment (Neumark and Button 2014). Prior studies demonstrate that once older workers experience job loss (e.g. during the Great Recession) it takes them longer to find new employment compared to their younger counterparts (Johnson and Butrica 2012, Murdock et al. 2021).

Moreover, recent research suggests that extended career disruptions in late working life during the Pandemic may eventually lead to more permanent career choices such as the decision to exit the workforce completely, for example to retire earlier or to become a homemaker (Brugiavini et al. 2023). Recent research implies that retirement might constitute a mid-term

consequence of job loss for older workers who can avail themselves of early retirement benefits (Brugiavini et al., 2023; Goda et al., 2023). However, other research suggests that older workers may postpone their retirement to try to make up for lost retirement savings due to job loss (Kung et al. 2023). Another study did not find a significant change in retirement patterns at all (Bassoli et al., 2023).

3.3.2 Gendered influence of containment measures

The risk of *unemployment scarring* can be exacerbated by social factors such as gender. The containment measures during the Pandemic disproportionately and adversely affect women's employment (OECD 2020c), which emphasizes the necessity of adopting an *intersectional approach* (Holman and Walker 2021). According to Fana et al. (2020), the gendered influence of the Covid-19 containment measures on individual careers is mostly rooted in *gender-segregated economic sectors*. In Europe, women are more frequently employed in sectors (e.g. retail, hospitality) which are forbidden to operate while mitigration measures are active due to high levels of social interaction (Brugiavini et al. 2022, OECD 2020c). Additonally, in those sectors, women are mostly hired in low-paid occupations (e.g. waitress) which are also more susceptible to layoffs because of their ineligibility for short-term work benefits or earnings replacements (Moehring et al. 2021). Yet, to a limited extent, women are also more frequently employed in essential (e.g. health sector) and teleworkable (e.g. public sector) sectors which are permitted to be performed during times of stringent containment measures. Therefore, women in essential jobs during the Pandemic were also more heavily exposed to the Covid-19 virus. Men on the other hand are more often found in non-essential sectors (e.g. manufacturing) with lower levels of social interactions that are partly allowed to operate under strict safety guidelines (Fana et al. 2020).

Apart from economic sectors, particularly the closure of childcare facilities but also other containment measures such as the closure of public transport and stay-at-home orders might additionally challenge women to compensate for the lack of professional care services by looking after grandchildren or older parents and therefore might opt to become a homemaker (Schmitz et al. 2022, Smolić et al. 2023). Especially older women are traditionally expected to shoulder unpaid care work compared to older men (Kelle 2020, Schmitz et al. 2023). Hence, women might provide support to both younger and older generations as a result of containment measures: Through providing grandparental childcare, they may support their adult children,

enabling them to maintain their labor force participation during the closure of daycare (Aparicio Fenoll 2020, Bratti et al. 2018). On the other hand, they may additionally take over care work for their older parents due to the lack of professional care services for older generations amid travel restrictions and stay-at-home orders. More stringent lockdown policies, including daycare closures, are shown to be linked to a higher probability of women shouldering care duties and exiting employment (Bassoli et al. 2021, Fervers et al. 2023). To date, research on how such containment measures are related to employment (e.g. being a homemaker) is scarce. There is evidence suggesting that more stringent lockdown policies, including daycare closures, are linked to a higher probability of women shouldering care duties (Bassoli et al. 2021). Thus, mid-term consequences of shouldering care work among women, may be to exit the workforce to become a homemaker or enter retirement.

Taken together, containment measures during the Pandemic can act like a significant *career shock* causing older workers to reconsider their long-term career plans. Older workers who experience job loss during the crisis, may face *unemployment scarring* (e.g. skill degradation) that extends beyond the initial shock and may eventually lead to prolonged unemployment or to the decision to exit the workforce completely (e.g. retirement, being a homemaker). In particular the forceful closure of sectors such as cafés, restaurants and non-essential shops is expected to more strongly disrupt women's employment participation compared to men. Particularly, the closure of non-essential shops must have more severe direct consequences for labor market participation because the retail sector is very workforce-intensive (OECD 2020a). The closure of daycare facilities can additionally disrupt employment careers, especially women's, because of increasing unpaid care duties. Other containment measures, such as stay-at-home orders and restrictions of social gatherings are likely to have indirect adverse effects on employment participation – particularly among men in non-teleworkable and non-essential jobs. The closure of public transport might affect women and men equally: For example, men in non-teleworkable jobs can have difficulties getting to work, whereas women are more likely disadvantaged because they have to take over the jobs of care professionals who are unable to travel to their clients. Lastly, containment measures such as teleworking recommendations may be crucial in preserving jobs during the Pandemic for both women and men.

Building upon these aforementioned theoretical and empirical perspectives, it is posited that the employment status of older workers is dependent upon past containment measures. First, it is hypothesized that longer durations of stay-at-home orders, daycare closures, closures

of public transport, restrictions on social gatherings, closures of cafés and restaurants, and closures of nonessential shops are associated with an increased probability of becoming unemployed, retired, a homemaker and being sick or disabled in the mid-term (*H1a*). Moreover, this article hypothesizes that teleworking recommendations are related to a higher probability of being employed and negatively related to retirement, being a homemaker and being sick or disabled in the mid-term (*H1b*). Second, it is expected that containment measures are more adversely related to women's employment participation compared to men. In particular, daycare closures, closures of cafés, restaurants and nonessential shops are expected to lead to a stronger probability of becoming unemployed, retired, a homemaker and being sick or disabled among women in comparison to men (*H2*).

3.4 Methods and measurement

This study combined (1) individual-level data from the second wave of the SHARE Covid-19 Survey (Börsch-Supan 2022d) including interview date data (Börsch-Supan 2022e) and (2) country-level data on the duration of different Covid-19 containment measures (e.g. start and end dates of lockdowns by country) from the European Centre for Disease Prevention and Control (ECDC 2022). Data collection of the second wave of the SHARE Covid-19 Survey took place in the summer of 2021 between June and August in 28 countries among respondents in Europe aged 50 years and over. Information on response measures to Covid-19 at the national level of 30 different European countries is based on official governmental public sources and documents the duration of various containment measures between March 2020 and August 2022. Combining these two data sources, this article created a unique dataset by merging individual-level data from SHARE with data on containment measures to Covid-19 on the country level. By linking the respondent's precise interview date with the start and end date of various response measures to Covid-19, depending on the respondent's country of residence, this study was able to calculate the individual exposure (number of weeks from March 2020 to August 2021) to different response measures to the Pandemic (e.g. stay-at-home orders, closure of daycare facilities) for each observation in the dataset. Those observations from where country-level data on response measures to Covid-19 were not available were not included in the analysis of this article. Furthermore, only those containment measures with substantial variation and information across countries and without high correlation to other containment measures were selected for the analysis in this article. For instance, the 'closure of primary schools' was excluded due to its high correlation with the 'closure of daycare facilities', which

could lead to biased results due to multicollinearity. Taken together, information on respondent's exposure to containment measures was available for 26 countries (Austria, Germany, Sweden, Netherlands, Spain, Italy, France, Denmark, Greece, Belgium, Czechia, Poland, Luxembourg, Hungary, Portugal, Slovenia, Estonia, Croatia, Lithuania, Bulgaria, Cyprus, Finland, Latvia, Malta, Romania, Slovakia). An overview of the duration of containment measures by country is available in Figures 1a-g in the appendix.

To comprehend how containment measures affected late working life, those respondents who reported in the first wave of the SHARE Covid-19 Survey (Börsch-Supan 2022c) that they were not in employment before the outbreak of the Pandemic (especially women) were excluded (n=36,079; 79.71%). Lastly, those observations with missing values for the variables utilised in this article were also eliminated (n=104; 1.12%). The final sample comprised 9,186 observations. Details regarding the sample characteristics can be found in the appendix (see Table 1 and 2). Additionally, for robustness checks, this article used information from the International Standard Classification of Occupations (ISCO-08) from SHARE wave 7 (Bergmann 2019, Börsch-Supan et al. 2013, Börsch-Supan 2022a) and wave 8 (Bergmann and Börsch-Supan 2021, Börsch-Supan et al. 2013, Börsch-Supan 2022b) to control for the economic sector that respondents worked in. If the information on respondents' ISCO-08 was not available in wave 8, information from wave 7 was used.

The analytical approach of this article encompassed two analytical steps. First, using multinomial logistic regression models, the association between the containment measures and employment was examined. Secondly, additional moderator analyses were utilised to investigate how this association differs between women and men. All results were presented as average marginal effects (AME) in percent.

3.4.1 Outcome

The outcome consisted of the current employment status of respondents at the time of the interview (between June and August 2021). It was assessed through 5 categories (1) '*Retired*', (2) '*Employed*', (3) '*Unemployed*', (4) '*Sick or disabled*' and (5) '*Homemaker and other*'. The category '*Employed*' also included self-employed respondents. Moreover, it was observed that the original '*Homemaker*' category in the survey predominantly comprised women. The low frequency of men in the sample regarding homemaking roles could result in reduced statistical power and potentially biased results. Given that this article examines in particular the differences in the association between containment measures and employment by gender, the

'*Homemaker*' and '*Other*' categories were combined. Those respondents that were classified as '*Other*' during the interview, did not apply to the remaining categories mentioned before. Therefore, the category '*Homemaker and other*' was considered as inactive unemployment, encompassing both homemakers (1%) and others in inactive unemployment (1%).

3.4.2 Explanatory Variables

The explanatory variables encompassed seven different containment measures: (1) '*Stay-at-home order*', (2) '*Closure of daycare facilities*', (3) '*Closure of public transport*', (4) '*Limit of social gathering indoors*', (5) '*Teleworking recommendations*', (6) '*Closure of cafés & restaurants*' and (7) '*Closure of nonessential shops*'. As previously described, each containment measure was represented by the duration, measured in weeks, during which respondents were exposed to that specific measure.

(1) '*Stay-at-home orders*' were referred to as lockdowns and understood as an enforced order during which all residents were required to remain at home. The (2) '*closure of daycare facilities*' described the shutdown of all nurseries and kindergartens. However, emergency childcare was generally available for parents who were required to work onsite for example in essential sectors like healthcare. Moreover, in this article, the (3) *'closure of public transport*' did not represented a full closure but a partially relaxed containment measure, where, for instance, only a limited amount of passenger seats could be used, the use of a face mask was mandatory and passengers needed a negative Covid-19 test result or had to be vaccinated. The containment measure (4) '*limit of social gathering indoors*' prevented social gatherings of over 50 participants indoors. The variable (5) '*teleworking recommendations*' consisted of the duration during which working from home was obligatory whenever it was possible. The (6) '*closures of cafés and restaurants*' measured the length where all cafés and restaurants including catering etc. were fully closed – yet, selling takeaway coffee or meals was still possible. Lastly, (7) '*closure of nonessential shops*' consisted of the duration during which all non-essential shops were forbidden to operate – however, ordering products for pick-up among customers was permitted.

3.4.3 Moderator and confounders

To analyse differences between the association of containment measures and employment by women and men, this article used *gender* as a moderator. Moreover, this study *controlled for gender, year of birth*, *Covid-19 infection*, *financial support from the government*, *internet use*, *subjective health*, *coresidential partner* and *children*. Prior research found that being in a coresidential partnership, having children and being in older birth cohorts is associated with a higher probability of being unemployed and in domestic work among older women (Schmitz et al. 2023). Furthermore, it has been shown that those respondents who use the internet and therefore have better digital skills are more frequently employed during the Pandemic (König and Seifert 2022). Lastly, it was assumed that especially those older workers with lower health issues – such as better self-rated health and/or who were infected with Covid-19 and are financially secure, that is, who did not need financial support from the government – were more likely to retire earlier (Kung et al. 2023, Stiemke and Hess 2022).

The variable '*coresidential partnership*' equalled 1 if respondents had a partner in their household at the time of the interview and 0 if they did not. Likewise, the item '*children*' had the value 1 if the interviewee had children and 0 if not. '*Covid-19 infection*' is coded 1 if the respondent has had the Covid-19 disease and 0 if not. '*Governmental financial support*' was coded 1 if the individuals received financial support from the government that was due to the Corona crisis and 0 if not. '*Internet use*' was measured as the use of the internet at least once since the outbreak of Covid-19 (such as for e-mailing, searching for information, making purchases or other purposes) and was coded as 1 if respondents did and 0 if otherwise. '*Subjective health*' was based on the evaluation of respondents' own subjectively perceived health at the time of the interview on a scale from 1 'Excellent' to 5 'Poor'.

Moreover, for robustness checks, this article included control variables for the economic sector in which respondents were employed before the Pandemic. The economic sector was not added to the main analysis due to its high proportion of missing values because of panel attrition. Compliant with the procedure of Basso et al. 2020, Brugiavini et al. 2022 and Fasani and Mazza 2020, three categories were derived using information from ISCO-08: (1) *Essential jobs*, (2) *remote work feasibility* and (3) *social interaction index*. *Essential jobs* encompassed those occupations that were crucial to ensure the functioning of society and were carried out despite their infection risks: It is coded 1 if respondents were employed in an essential job and 0 if not. The *remote work feasibility* characterized the possibility of certain jobs being performed remotely, ranging from 0 (occupation cannot be done at home) to 1 (occupation can

be fully performed at home). Whereas, the *social interaction index* measured the degree to which respondents have contact with customers or the public while performing their job. It ranged from 1 (occupation primarily involved social interactions) to 0 (occupation does not involve social interactions at all) (Basso et al. 2020, Brugiavini et al. 2022, Fasani and Mazza 2020).

3.5 Results

3.5.1 Late working life and duration of containment measures

Table 3 shows the average duration of containment measures in weeks by the employment status of older workers. Most of the respondents were employed (79.18%) or retired (15.03%) at the time of the interview in the summer of 2021. Only a minority of individuals were in inactive unemployment such as being sick or disabled (1.09%) or as a homemaker and other (2.40%).

Across Europe, especially 'teleworking recommendations' (41.60 weeks), the 'closure of cafés and restaurants' (18.03 weeks) and 'closure of public transport' (13.76 weeks) had the lengthiest durations. Whereas 'stay-at-home order' (5.44 weeks), restrictions of social gatherings (6.37 weeks) and the closure of non-essential shops (9.98 weeks) were the shortest mitigation measures. The length of duration differed considerably by country. Especially Sweden and Austria had the longest length of teleworking recommendations. The duration of closures of cafés and restaurants was particularly pronounced in Portugal and France. Whereas closures of public transport were especially long in Portugal and Poland. More stringent lockdowns such as stay-at-home orders were particularly prolonged in Portugal, France, Austria and Lithuania. Whereas countries such as Sweden did not have a full lockdown at all and imposed minimal mandatory containment measures.

Overall, the results suggest that not only the type but especially the duration of containment is crucial concerning the employment participation of older workers. Respondents in countries with longer duration of containment measures were more frequently unemployed, sick or disabled or a homemaker and in other inactivities. Older workers were more often in retirement and unemployment in countries with longer durations of stay-at-home orders, daycare closures, limits of social gatherings and closure of non-essential shops as well as shutdowns of cafés and restaurants. Respondents within countries where the duration of daycare

facility closures was more pronounced were more frequently homemaking or in other kinds of inactivity.

Table 3. Average duration of containment measures in weeks by employment status (n=9,186)

	Retired	**Employed**	**Unemployed**	**Sick or disabled**	**Home-maker & other**	Total
Stay-at-home orders	4.94	5.50	5.83	5.16	5.33	5.41
Closure daycare	13.31	14.31	15.60	13.09	16.25	14.22
Closure public transport	12.30	13.92	17.84	16.39	12.52	13.76
Limit social gathering indoor	8.76	5.85	5.64	5.45	10.03	6.37
Teleworking recommendations	42.18	41.58	34.77	38.96	46.53	41.60
Closure of cafés and restaurants	20.47	17.54	18.11	26.38	15.04	18.03
Closure of non-essential shops	10.49	9.89	10.10	8.78	10.13	9.98
Total (%)	15.03	79.18	2.30	1.09	2.40	

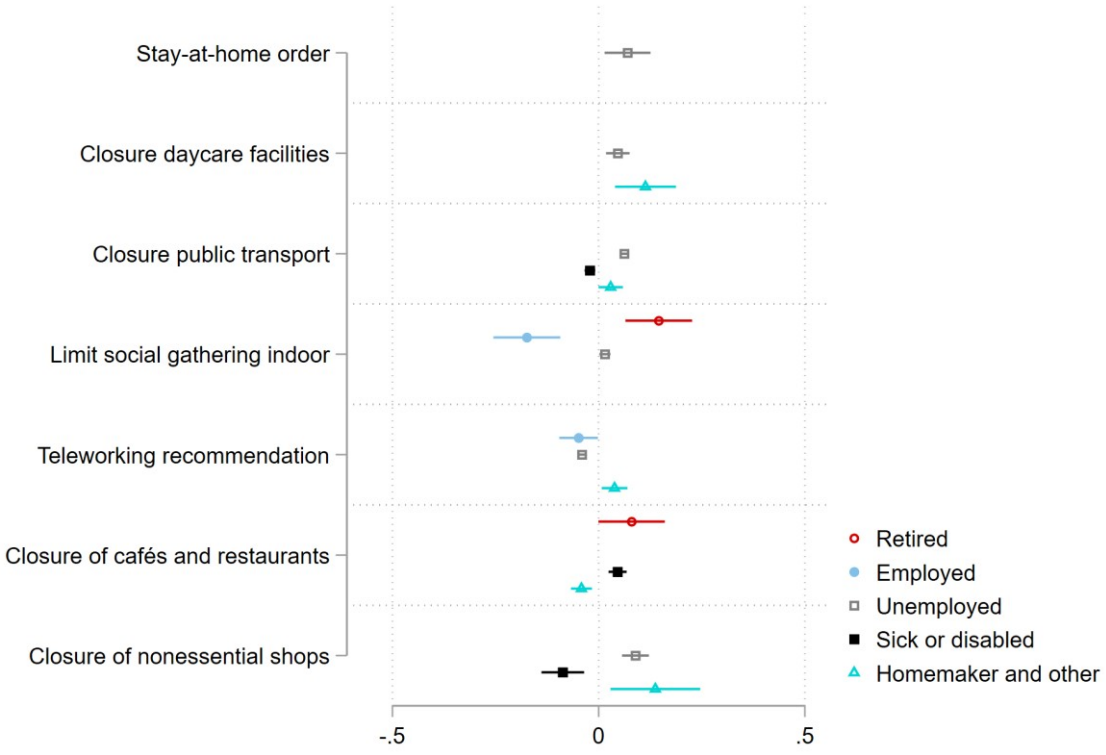
Note: weighted;

Moreover, individuals were more often sick or disabled in countries where the shutdowns of cafés and restaurants were longer. However, regarding teleworking recommendations the results were mixed: Those individuals in countries with longer durations of teleworking recommendations were more frequently employed but they also exhibited higher rates of retirement, homemaking or other forms of inactive unemployment.

3.5.2 Associations of containment measures with late working life

The first hypothesis *H1a* assumed that longer durations of stay-at-home orders, daycare closures, closures of public transport, restrictions on social gatherings, closures of cafés and restaurants and closure of nonessential shops are associated with a heightened probability of being retired, unemployed, sick or disabled, homemaker or within other forms of inactivity. The results mostly confirmed the hypothesized associations of earlier containment measures with late working life among older individuals.

Figure 2. Average marginal effects (AME) based on multinomial regression analysis in percent (n = 9,186)



Note: weighted; robust cluster estimator (countries); controls: gender, year of birth, covid infection, internet use, financial support government, coresidential partner, number of children, subjective health; only significant results ($p < 0.05$) are reported.

Figure 2 shows the average marginal effects based on multinomial regression analysis in percentage points (pp). Earlier *retirement* was linked to longer social gathering restrictions (0.15 pp per week) and shutdowns of cafés and restaurants (0.08 pp per week). Longer periods of stay-at-home orders (0.07 pp per week), closures of daycare facilities (0.05 pp per week),

closures of public transport (0.06 pp per week), limiting of social gatherings (0.02 pp per week) and shutdowns of nonessential shops (0.09 pp per week) were related to a higher probability of *unemployment*. Longer restrictions of social gatherings (-0.17 pp per week) were related to a lower probability of being *employed*. Longer periods of closures of cafés and restaurants (0.04 pp per week) were associated with being *sick or disabled*. Lengthier shutdowns of daycare facilities (0.11 pp per week), non-essential shops (0.14 pp per week) and public transport (0.03 pp per week) were associated with a higher probability of being a *homemaker* and other kinds of *inactivity*.

Yet, longer durations of closures of cafés and restaurants (-0.04 pp per week) were found to be weakly related to a lower probability of being a *homemaker* and other forms of *inactive* employment. Moreover, prolonged shutdowns of public transport (-0.02 pp per week) and non-essential shops (-0.09 pp per week) were negatively related to being *sick or disabled*.
Furthermore, *H1b* stated that extended durations of teleworking recommendations are linked to a higher probability of being employed and a lower probability of being in retirement, sickness or disablement, being a homemaker and other forms of inactivity. The findings do not support this assumption and showed both a negative association with *employment* (-0.05 pp per week) but also with *unemployment* (-0.04 pp per week). Moreover, prolonged durations of teleworking recommendations were connected to a higher probability of being a *homemaker* and other kinds of *inactive* (0.04 pp per week) unemployment.

3.5.3 Gender differences

The second hypothesis *H2* postulated that containment measures were more adversely related to women's late working life compared to men. It was expected that, in particular, the closure of daycare facilities and the shutdown of cafés, restaurants and non-essential shops should lead to a higher probability of being retired, unemployed, sick or disabled and being a homemaker or in other forms of inactivity among women in contrast to men. Figures 3a to 3e depict the results of all significant interaction effects. All results can be viewed in more detail including control variables in Table 4 in the appendix.

The outcome mostly yielded support for *H2*. In line with the hypothesis, the results suggested that the association of containment measures with late working life is gendered. Women are more likely to exit the workforce completely (e.g. as a homemaker or being inactive) as a consequence of past mitigation strategies. Containment measures were mainly

linked to a higher probability of retirement, being a homemaker or other forms of inactivity and were therefore, although only weakly, related to a lower probability of (active) unemployment.

In particular, longer durations of closures of daycare facilities (0.20 pp per week) and closures of non-essential shops (0.31 pp per week) were strongly linked to a higher probability of being a *homemaker* or of being in some other form of *inactivity* among women. Moreover, extended periods of stay-at-home orders (0.12 pp per week) and closure of non-essential shops (0.12 pp per week) were more closely related to *unemployment* amidst women. In contrast to men, longer periods of daycare closures (-0.04 pp per week) and closure of cafés and restaurants (-0.04 pp per week) were weakly associated with a lower probability of being actively *unemployed*. Furthermore, women faced a higher probability of being in earlier *retirement* with prolonged social gathering restrictions (0.20% per week), closures of cafés and restaurants (0.14 pp per week) and teleworking recommendations (0.11 pp per week). Among women, extended durations of teleworking recommendations were more strongly connected with a lower probability of being *employed* (-0.12 pp per week) compared to men. However, teleworking recommendations were also weakly linked to *unemployment* (0.03 pp per week) among women.

Men's employment participation in late working life was more strongly associated with containment measures such as indoor social gathering restrictions, the shutdown of cafés and restaurants and the closure of public transport. Unlike women, they were less prone to exit the workforce entirely and more likely to be actively *unemployed* as a result of mitigation strategies in the mid-term. Closure of daycare (0.17 pp per week), public transport (0.09 pp per week) and social gathering restrictions (0.05 pp per week) were linked to *unemployment*. Lengthier periods of closures of cafés and restaurants (-0.19 pp per week) were associated to a lower probability of *employment*. Whereas teleworking recommendations (-0.06 pp per week) were negatively related to *unemployment* among men. In contrast to women, the closure of non-essential shops (-0.23 pp per week) and public transport (-0.11 pp per week) was negatively related to *retirement*. However, the restrictions in social gatherings (0.07 pp per week) and the shutdown of cafés and restaurants (0.08 pp per week) were also, although only weakly, linked to being a *homemaker* or within some other form of inactive *unemployment* among men.

Figure 3a. Retired: Conditional-effects of response measures to Covid-19 by gender (n = 9,186)

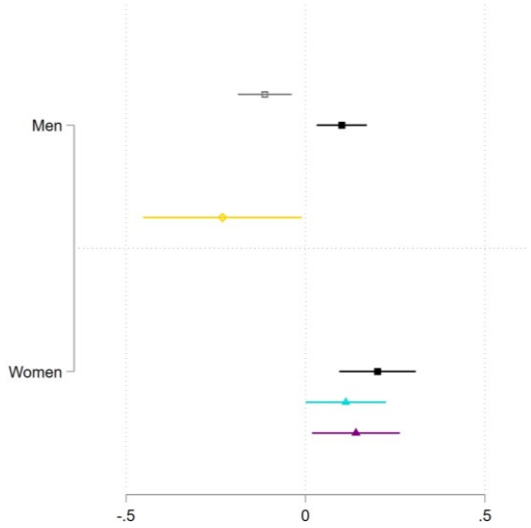


Figure 3b. Employed: Conditional-effects of response measures to Covid-19 by gender (n = 9,186)

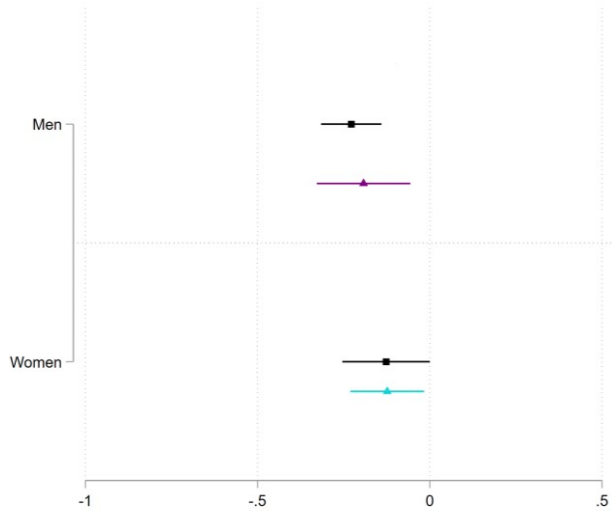


Figure 3c. Unemployed: Conditional-effects of response measures to Covid-19 by gender (n = 9,186)

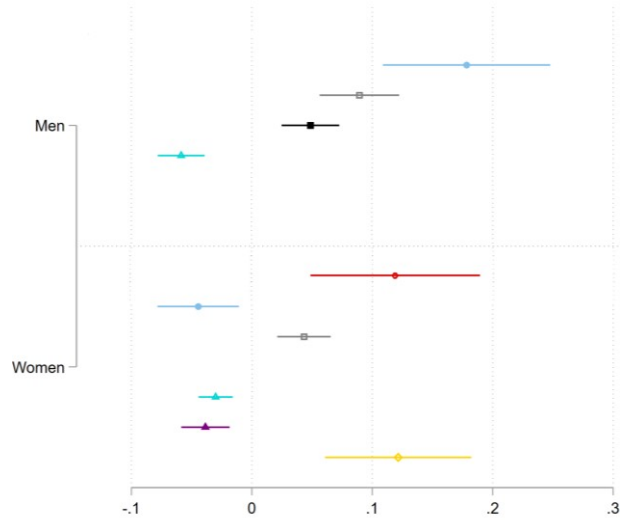


Figure 3d. Sick or disabled: Conditional-effects of response measures to Covid-19 by gender (n = 9,186)

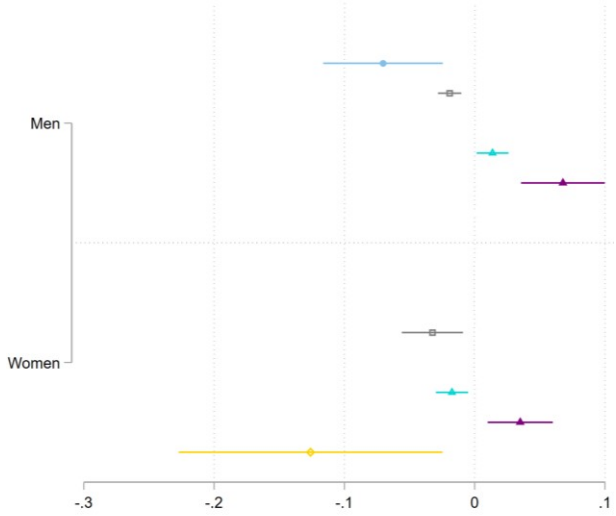
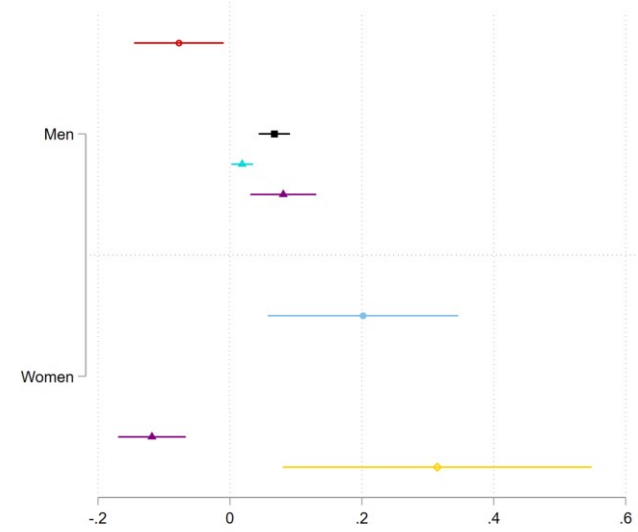
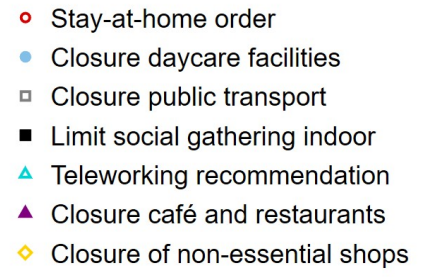


Figure 3e. Homemaker & other: Conditional-effects of response measures to Covid-19 by gender (n = 9,186)





Note for Figures 3a-3e: weighted; only significant results are reported ($p < 0.05$); controls: gender, year of birth, covid infection, internet use, financial support government, coresidential partner, number of children, subjective health

3.6 Discussion

This study examines how the duration of different containment measures is related to late working life over 18 months. This article aims to gain knowledge on which containment measures have lasting implications for older workers' employment participation in late working life and how these consequences differ across genders. In doing so, this research takes advantage of the heterogeneity of these mitigation measures across 26 European countries by linking country-level data from the European Centre of Disease Prevention and Control with individual-level data from the second SHARE Corona Survey.

Overall, this article provides evidence that past containment measures are still adversely shaping employment participation in late working life 1.5 years after the outbreak of the Pandemic. Older workers within countries with longer durations of containment measures – especially closure of daycare facilities, shutdown of nonessential shops and restrictions of indoor social gatherings – are either experiencing unemployment or leaving the workforce entirely through early retirement, homemaking, or other forms of inactive unemployment. The adverse mid-term consequences of containment measures for employment participation mirror prior research (Theodoropoulos and Voucharas 2023). Evidence from this article suggests, in line with previous studies, that older workers might still be facing prolonged unemployment and are encountering challenges reentering the labor market since the career shock at the onset of the Pandemic (Johnson and Butrica 2012, Murdock et al. 2021). Especially in countries with longer social gathering restrictions and daycare facility closures, older workers appear to discontinue their job search effort and leave the workforce completely, through retirement or homemaking (Brugiavini et al. 2023).

Moreover, containment measures are differently related to women compared to men. Unlike men, women were much more prone to exit the labor market completely to become a homemaker or to be involved in some other kind of inactive unemployment: Especially as a consequence of longer durations of daycare facility closures and shutdowns of non-essential shops. Men on the other hand, were more strongly affected by unemployment and less likely to leave the workforce completely. Particularly longer durations of social gathering restrictions, closures of cafés and restaurants and closure of daycare facilities lead to an increase in unemployment among men.

These results support the assumption that the consequences of containment measures are gendered. In line with previous research, the outcome of this study suggests that women are doubly disadvantaged: They may have to compensate for the decreased availability of professional care work (e.g. grandchild care, care for older relatives) especially due to

mitigation measures such as daycare closures (Bratti et al. 2018, Schmitz et al. 2022). Moreover, women are more prone to job loss because they are more frequently employed in economic sectors that are directly shut down (e.g. closure of non-essential shops) (Brugiavini et al. 2022). After losing their job, they may have difficulties re-entering employment over time and decide to leave the workforce completely to become a homemaker by taking over increased care duties (Brugiavini et al. 2023, Goda et al. 2023). Earlier research suggests that older women might be supporting their children's labor market participation by looking after their grandchildren and as a consequence give up their workforce engagement (Bratti et al. 2018). Yet, men were also affected by inactive unemployment due to the closure of cafés and restaurants and social gathering restrictions and were also heavily affected by childcare closures concerning unemployment. The results may be explained by the increased demand of care work, which eventually also required men to contribute to care duties during employment disruptions. Earlier research shows that men generally increased their participation in unpaid care labor to a certain degree (Hank and Steinbach 2021, Zamberlan et al. 2022).

To support the evidence of this article, additional robustness checks are carried out controlling for the economic sector in which respondents are employed. The results can be viewed in Table 5 in the appendix. Those respondents within essential and remote jobs are more likely employed and less likely to exit the workforce due to the Pandemic. The association between containment measures and employment participation in late working life mostly disappears when the economic sector is included in the analysis. This suggests that a part of the consequences of containment measures for an individual's employment participation depends on the type of occupation in which they are employed. Yet, the comparison of the results of the robustness checks to the main analysis should be interpreted with caution because of the large difference in the sample size.

However, results considering longer teleworking recommendations and older workers' employment participation are mixed. Whereas men are less likely unemployed within countries with prolonged teleworking recommendations, this article finds only inconclusive results among women. This may be due to the leap in digitalization during the Pandemic which may have overwhelmed those older workers with less computer proficiency (König and Seifert 2022). Moreover, this study generally finds that containment measures such as the closure of non-essential shops and public transport are likely to reduce the probability of being sick or disabled, which may be explained by the lower infection risk with Covid-19.

3.6.1 Theoretical implications

The results of this study align with the assumption of *unemployment scarring* (Arulampalam et al. 2001, Filomena 2023), indicating that the lasting impact of job loss, resulting from virus suppression measures, becomes evident as older workers confront enduring effects on their careers. Thus, past containment measures may influence workers to make permanent career decisions, after experiencing prolonged periods of unemployment (e.g. due to skill mismatch, health restrictions or age discrimination). Results of this study show that as a mid-term consequence older workers are likely to exit the workforce completely through retirement or being a homemaker (Brugiavini et al. 2023, Hershbein and Kahn 2018, Murdock et al. 2021, Pit et al. 2021, Turek and Henkens 2020). Women, in particular, are more prone to make permanent career decisions by leaving the workforce due to earlier containment measures. This underscores the necessity to apply an *intersectional approach* (Holman and Walker 2021) to understand the gendered consequences of *unemployment scarring* due to the Pandemic.

3.6.2 Limitations, outlook and suggestions for further research

Using the heterogeneity of containment measures across countries to compare their differential consequences for older workers' labor market participation is connected to several limitations. Firstly, workforce losses may not solely result from the longer duration of containment measures but also from structural and institutional factors that can not be controlled for within this analysis but might have blurred the results. Examples are differences in job retention schemes but also within the structure of the labor market. For instance, the share of older workers employed in non-essential sectors with a high degree of social interaction, which was largely shut down during mitigation strategies (e.g. cafés and restaurants), is larger in southern European countries such as Spain or Greece (Fana et al. 2020). Thus this article may have overestimated the effect of mitigation strategies.

Secondly, mandatory containment measures are not fully explaining the adverse consequences for the labor market. In countries with almost no restrictions, residents may decide to voluntarily physically distance themselves from the public by staying at home which may have similar consequences for the labor market (e.g. Sweden). Third, there are differences in the implementation of the containment measures such as the level of enforcement by regions (e.g. Germany) which can not be considered in this research but may have affected the results. Fourthly, the availability of data from official government sources from where the data is

collected also varies by country. Therefore, some information on the duration of containment measures might be incomplete.

Fifthly, apart from the restrictions within the country-level data, this article cannot examine long-term consequences of the containment measures during the Pandemic due to the unavailability of survey data covering longer periods. Lastly, this article does not take into account the differences in the working hours as a result of past containment measures. Unfortunately, information on part-time or full-time work is not available at the time of the interview of respondents and thus can not be linked precisely to the exposure to the duration of containment measures.

However, this article provides important evidence on the differential mid-term consequences of containment measures for older worker's employment participation, especially regarding gender discrepancies – with women being more adversely affected. The results suggest, that policymakers still have to compensate for the detrimental repercussions (e.g. workforce losses) of the Pandemic. Moreover, they should be cautious during future health crises when implementing containment measures such as the closure of childcare facilities and workplaces, as these mitigation strategies have the most adverse consequences. However, more research is needed to understand the long-term consequences of various containment measures for late working life while taking the shortcomings of this article into account.

3.7 Appendix

Table 1. Sample characteristics (n=9,186)

Variables	Percent / Mean values (min – max)
Employment	
Retired	15.03
Employed	79.18
Unemployed	2.30
Sick or disabled	1.09
Homemaker and other	2.40
Containment measures (duration in weeks)	
Stay-at-home order	5.41 (0-23.00)
Closure daycare	14.22 (0-28.14)
Closure public transport	13.76 (0-70.00)
Limit social gathering indoor	6.37 (0-55.43)
Teleworking recommendations	41.60 (0-77.43)
Closure of cafés and restaurants	18.03 (0-70.43)
Closure of nonessential shops	9.98 (0-33.71)
Controls	
Gender (Ref. male)	50.32
Year of birth	1960.44 (1921-1971)
Covid infection (Ref. Not tested positive)	8.38
Internet use (Ref. No internet use)	82.85
Financial support government (Ref. no support)	10.79
Children (Ref. no children)	0.81
Coresidential partner (Ref. no partner)	75.48
Subjective health	2.86 (1-5)

Note: weighted.

Table 2. Correlation matrix of all variables used in the analysis (n=9,186)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) Retired	1.00																			
(2) Employed	-0.85*	1.00																		
(3) Unemployed	-0.08*	-0.25*	1.00																	
(4) Sick or disabled	-0.07*	-0.21*	-0.02	1.00																
(5) Homemaker & other	-0.08*	-0.23*	-0.02*	-0.02	1.00															
(6) Stay-at-home order	0.03*	-0.03*	-0.00	0.02	0.02*	1.00														
(7) Closure daycare	0.01	-0.03*	0.02	-0.02*	0.06*	0.22*	1.00													
(8) Closure public transport	-0.00	-0.02	0.01	0.02	0.03*	0.14*	-0.02*	1.00												
(9) Limit social gathering indoor	-0.00	0.01	0.01	-0.04*	0.01	-0.18*	-0.17*	-0.02*	1.00											
(10) Teleworking recommendations	0.04*	-0.04*	-0.02	0.03*	0.00	0.16*	0.28*	0.22*	-0.16*	1.00										
(11) Closure of cafés and restaurants	0.04*	-0.06*	-0.01	0.05*	0.01	0.44*	0.13*	0.37*	-0.23*	0.21*	1.00									
(12) Closure of non-essential shops	0.04*	-0.03*	0.01	-0.05*	0.00	-0.19*	0.10*	-0.56*	0.12*	-0.30*	-0.06*	1.00								
(13) Gender	-0.07*	0.04*	0.01	-0.02	0.08*	0.01	-0.03*	-0.03*	-0.01	-0.04*	0.01	0.02	1.00							
(14) Year of birth	-0.48*	0.41*	0.06*	0.05*	0.00	0.02	0.10*	0.04*	0.06*	0.09*	0.01	-0.08*	0.15*	1.00						
(15) Covid infection	-0.03*	0.04*	-0.02	0.01	-0.02*	0.02	0.03*	0.06*	-0.03*	0.02*	0.03*	-0.04*	0.02*	0.06*	1.00					
(16) Internet use	0.11*	-0.13*	0.04*	0.02	0.06*	0.07*	0.13*	0.07*	0.02	-0.02	0.01	-0.02	-0.06*	-0.11*	-0.01	1.00				
(17) Financial support government	0.02	-0.03*	0.03*	0.00	-0.02	0.05*	0.10*	-0.03*	-0.07*	0.03*	0.05*	0.01	0.03*	-0.02	0.03*	-0.01	1.00			
(18) Children	0.06*	-0.05*	0.01	-0.01	0.01	-0.03*	-0.05*	-0.02	-0.00	-0.09*	-0.01	0.05*	0.01	-0.12*	0.03*	0.02	-0.01	1.00		
(19) Coresidential partner	0.06*	-0.06*	0.02	0.00	-0.01	0.00	-0.07*	-0.05*	-0.04*	-0.05*	0.02	0.01	0.14*	-0.15*	-0.02*	0.00	0.03*	-0.14*	1.00	
(20) Subjective health	0.05*	-0.10*	0.05*	0.15*	0.00	0.01	-0.11*	0.10*	-0.07*	-0.17*	0.01	-0.07*	-0.01	-0.08*	0.06*	0.11*	0.02*	0.02*	0.03*	1.00

Note: weighted; * shows significance at $p < 0.05$.

Table 4. Average marginal effects (AME) based on multinomial regression analysis in percent (n= 9,186)

	M1					M2				
	Retired	**Employed**	**Unemployed**	**Sick or disabled**	**Homemaker & other**	**Retired**	**Employed**	**Unemployed**	**Sick or disabled**	**Homemaker & other**
Containment measures										
Stay-at-home orders	0.09	-0.19	0.07*	-0.05	0.08	0.09	-0.14	0.05	-0.05	0.05
Closure daycare	-0.04	-0.11	0.05**	-0.01	0.11**	-0.04	-0.09	0.05**	-0.02	0.09*
Closure public transport	-0.09	0.02	0.06***	-0.02**	0.03*	-0.09	0.03	0.06***	-0.03***	0.02
Limit social gathering indoor	0.15***	-0.17***	0.02*	-0.01	0.02	0.14***	-0.17***	0.01	-0.00	0.02
Teleworking recommendations	0.06	-0.05*	-0.04***	-0.01	0.04*	0.06	-0.05*	-0.04***	-0.00	0.04*
Closure of cafés and restaurants	0.08*	-0.07	-0.01	0.04***	-0.04**	0.07	-0.09	-0.01	0.05***	-0.01
Closure of nonessential shops	-0.20	0.06	0.09***	-0.09**	0.14*	-0.21	0.07	0.09***	-0.08***	0.13**
Containment measures*Gender										
Women										
Stay-at-home orders	-	-	-	-	-	0.03	-0.30	0.12**	-0.05	0.19
Closure daycare	-	-	-	-	-	-0.10	-0.09	-0.04*	0.03	0.20**
Closure public transport	-	-	-	-	-	-0.06	-0.01	0.04***	-0.03**	0.07
Limit social gathering indoor	-	-	-	-	-	0.20***	-0.13*	-0.02	-0.01	-0.04
Teleworking recommendations	-	-	-	-	-	0.11*	-0.12*	-0.03***	-0.02**	0.06
Closure of cafés and restaurants	-	-	-	-	-	0.14*	-0.02	-0.04***	0.03**	-0.12***
Closure of nonessential shops	-	-	-	-	-	-0.19	-0.12	0.12***	-0.13*	0.31**
Men										
Stay-at-home orders	-	-	-	-	-	0.13	0.04	-0.04	-0.05	-0.08*
Closure daycare	-	-	-	-	-	0.01	-0.12	0.17***	-0.07**	0.00
Closure public transport	-	-	-	-	-	-0.11**	0.06	0.09***	-0.02***	-0.01
Limit social gathering indoor	-	-	-	-	-	0.10**	-0.23***	0.05***	0.01	0.07***
Teleworking recommendations	-	-	-	-	-	0.01	0.01	-0.06***	0.01*	0.02*
Closure of cafés and restaurants	-	-	-	-	-	0.02	-0.19**	0.03	0.07***	0.08**
Closure of nonessential shops	-	-	-	-	-	-0.23*	0.24	0.05	-0.04	-0.02

Controls										
Gender (Ref. male)	0.83	-3.99*	-0.19	0.29	3.05*	0.83	-4.00***	-0.20	0.34*	3.04***
Year of birth	-2.96***	2.65***	0.42***	0.00	-0.11	-2.98***	2.65***	0.42***	0.00	-0.09
Covid infection (Ref. Not tested positive)	-1.19	2.15	-0.23	-0.20	-0.52	-1.34	2.08	-0.10	-0.13	-0.51
Internet use (Ref. No internet use)	-7.48**	11.93***	-0.87	-0.99	-2.57***	-7.75**	11.81***	-0.82	-0.86	-2.37***
Financial support government (Ref. no support)	-6.53**	10.06***	-0.51	-0.68*	-2.33***	-6.41*	9.64**	-0.24	-0.66*	-2.33***
Coresidential partner (Ref. no partner)	1.58	-0.37	-1.36	0.29	-0.15	1.42	-0.38	-1.39	0.45*	-0.11
Children (Ref. no children)	-0.32	-0.82	1.99***	-1.07	0.21	-0.51	-0.84	1.95***	-0.84*	0.24
Subjective health	1.39*	-4.69***	0.66	1.82***	0.82*	1.45*	-4.64***	0.68	1.73***	0.78*

Note: weighted; robust cluster estimator (countries); *p < .05; **p < .01; ***p < .001; Base category: employed.

Table 5. Robustness-check: controlling for employment sector. Average marginal effects (AME) based on multinomial regression analysis in percent (n= 4,192)

	M1					M2				
	Retired	**Employed**	**Unemployed**	**Sick or disabled**	**Homemaker & other**	**Retired**	**Employed**	**Unemployed**	**Sick or disabled**	**Homemaker & other**
Containment measures										
Stay-at-home orders	0.30*	-0.37*	0.05	-0.02	0.02	0.34*	-0.29	-0.01	-0.03	-0.01
Closure daycare	-0.12	-0.19*	0.07**	-0.04	0.04	0.11	-0.19*	0.07**	-0.04*	0.04
Closure public transport	-0.05*	0.03	0.06***	-0.02***	0.03*	-0.06**	0.06	0.06***	-0.02***	-0.04**
Limit social gathering indoor	0.15***	-0.25***	0.06*	-0.01	0.03*	0.14***	-0.24***	0.05**	0.01	0.04*
Teleworking recommendations	0.05*	-0.06**	-0.03**	-0.01	0.03*	0.05**	-0.06**	-0.03**	0.01	0.04**
Closure of cafés and restaurants	0.09**	-0.20***	-0.06***	0.07***	-0.02	0.07**	-0.23***	0.05**	0.08***	0.03
Closure of nonessential shops	-0.06	0.02	0.09***	-0.02	0.02	-0.08	0.02	0.07**	-0.03	0.02
Containment measures*Gender										
Women										
Stay-at-home orders	-	-	-	-	-	0.23	-0.39	0.06	-0.05	0.05
Closure daycare	-	-	-	-	-	-0.14	-0.09	-0.03	-0.07	0.05
Closure public transport	-	-	-	-	-	-0.02	-0.03	0.02	-0.02	-0.04
Limit social gathering indoor	-	-	-	-	-	0.19***	-0.16*	-0.03*	-0.00	-0.06
Teleworking recommendations	-	-	-	-	-	0.13***	-0.18***	-0.02	-0.00	0.05
Closure of cafés and restaurants	-	-	-	-	-	0.19***	-0.18**	0.05*	0.03*	-0.08*
Closure of nonessential shops	-	-	-	-	-	-0.05	-0.26	0.10**	-0.02	0.12
Men										
Stay-at-home orders	-	-	-	-	-	0.41**	-0.15	-0.10	-0.11	-0.07
Closure daycare	-	-	-	-	-	0.08	-0.29*	0.18**	-0.01	0.04
Closure public transport	-	-	-	-	-	-0.12***	0.07	0.10***	-0.03*	-0.03
Limit social gathering indoor	-	-	-	-	-	0.10*	-0.32***	0.07*	0.03	0.12**
Teleworking recommendations	-	-	-	-	-	0.01	0.04	-0.06***	0.01	0.03
Closure of cafés and restaurants	-	-	-	-	-	-0.01	-0.29**	0.03	0.13***	0.14*
Closure of nonessential shops	-	-	-	-	-	-0.20	0.26	0.04	-0.04	-0.06

Controls										
Gender (Ref. male)	1.55	-1.58	-0.67	-0.29	0.99	1.52*	-1.63	-0.69*	-0.22	1.03*
Year of birth	-3.36***	3.27***	0.15	0.06	-0.13	-3.38***	3.22***	0.17	0.09	-0.09
Covid infection (Ref. Not tested positive)	-2.52	0.65	-0.04	-0.00	1.92	-2.92	0.96	0.19	0.01	1.76
Internet use (Ref. No internet use)	-10.28**	11.12***	-0.26	-0.67	0.09	10.41**	10.40***	0.03	-0.60	0.58
Financial support government (Ref. no support)	-6.51	10.03*	-1.28*	-0.06	-2.17***	-6.24	9.71*	-1.16*	-0.01	-2.25***
Coresidential partner (Ref. no partner)	0.79	1.72	-1.24	0.51	-1.78	0.47	1.75	-1.27	0.52*	-1.47
Children (Ref. no children)	2.70	-3.89	0.56	-0.17	0.80	2.49	-3.86	0.54	-0.14	0.96
Subjective health	0.06	-4.22***	1.31***	1.64***	1.20***	0.13	-4.39***	1.27**	1.69***	1.29**
Employment sector										
Essential jobs	-3.61*	6.04**	-0.80	0.02	-1.65**	-3.57*	6.31***	-0.87	-0.07	-1.80**
Remote work feasability	-0.69	5.70*	-0.89	-1.18**	-2.93**	-0.97	6.42*	-1.08	-1.25**	-3.12*
Social interaction index	-0.50	2.86	-0.02	-0.47	-1.86	-0.66	3.28	-0.38	-0.45	-1.80

Note: weighted; robust cluster estimator (countries); *p < .05; **p < .01; ***p < .001; Base category: employed.

Figure 1a. Duration of stay-home-orders by country

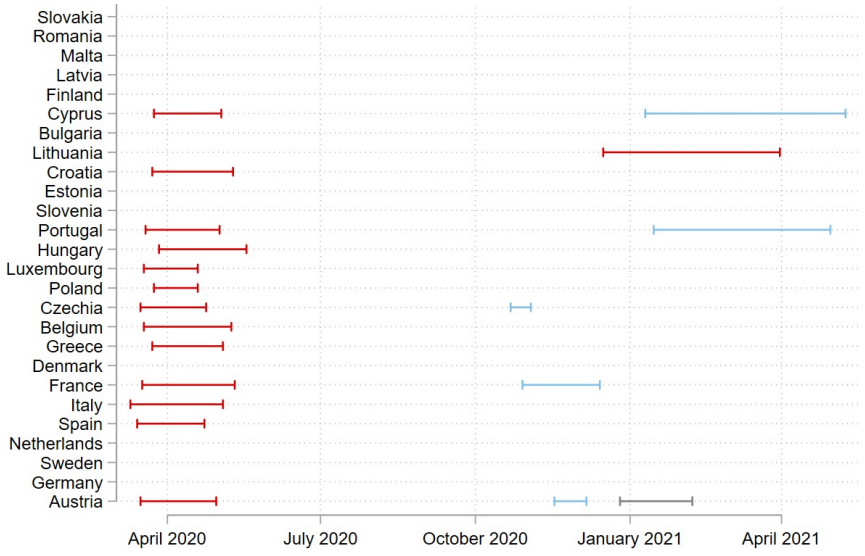


Figure 1b. Duration of daycare closures by country

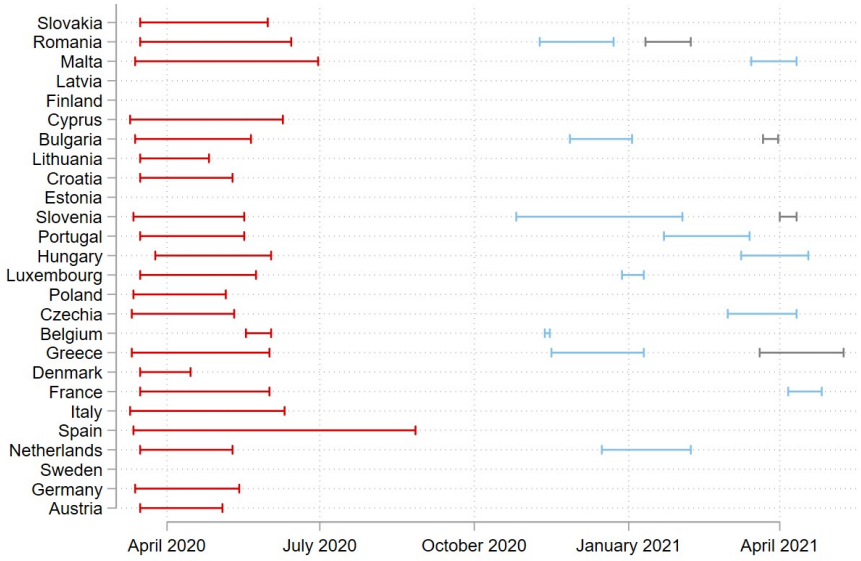


Figure 1c. Duration of public transport closure by country

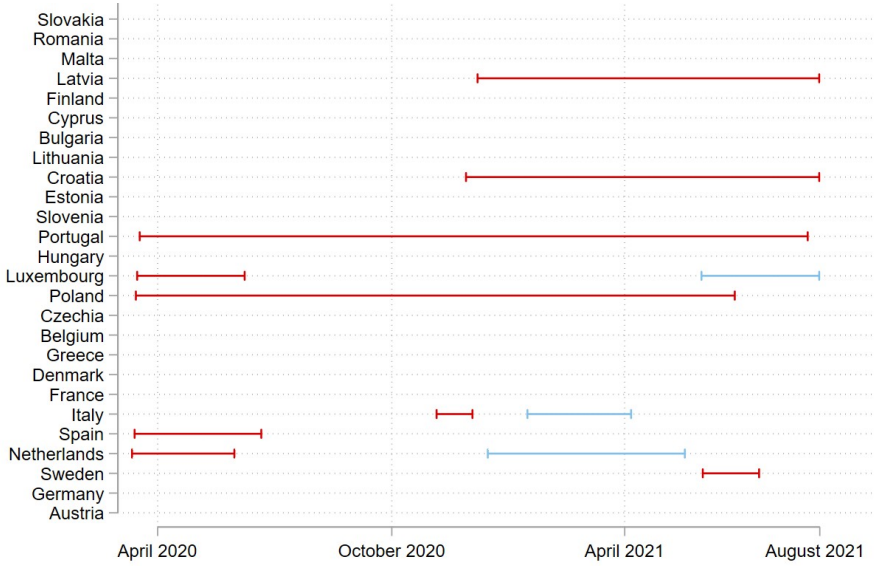


Figure 1d. Duration of indoor social gathering limits by country

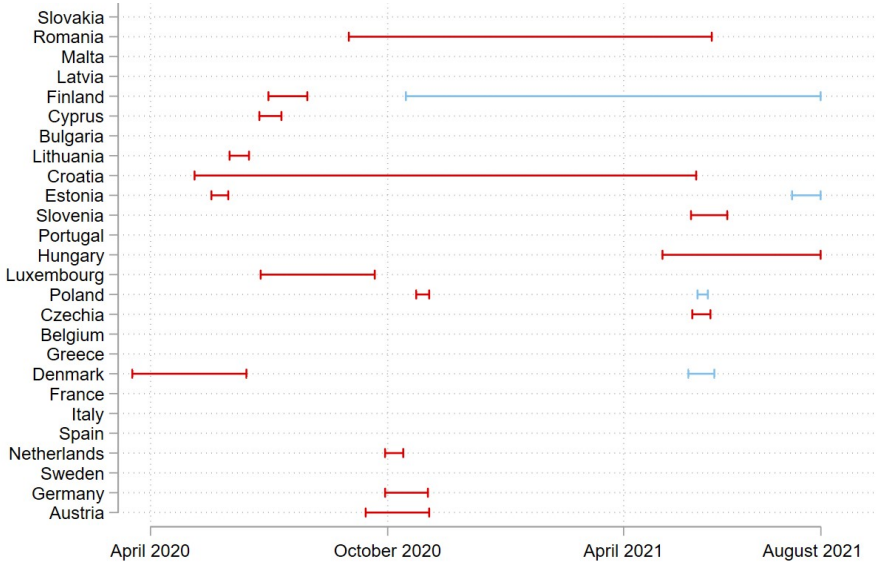


Figure 1e. Duration of teleworking recommendations by country

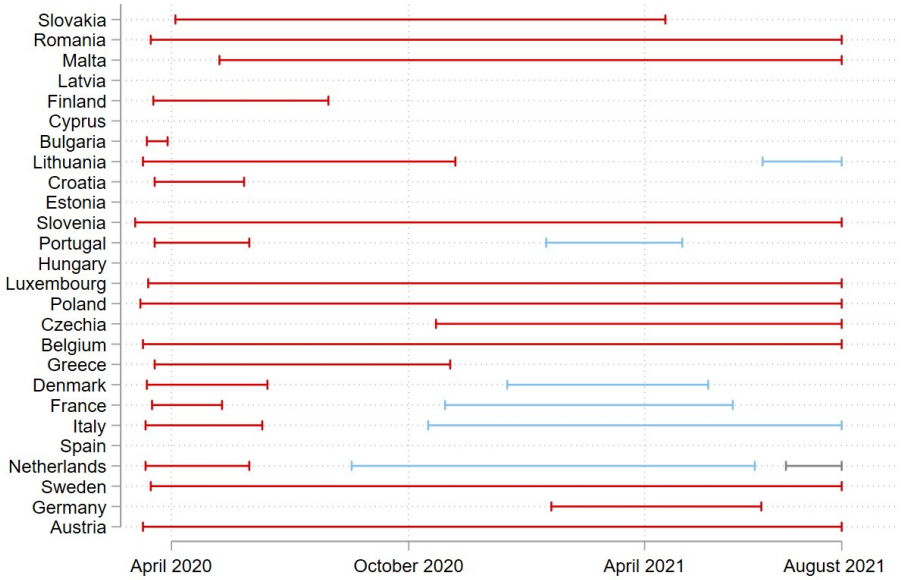


Figure 1f. Duration of closure of cafés and restaurants by country

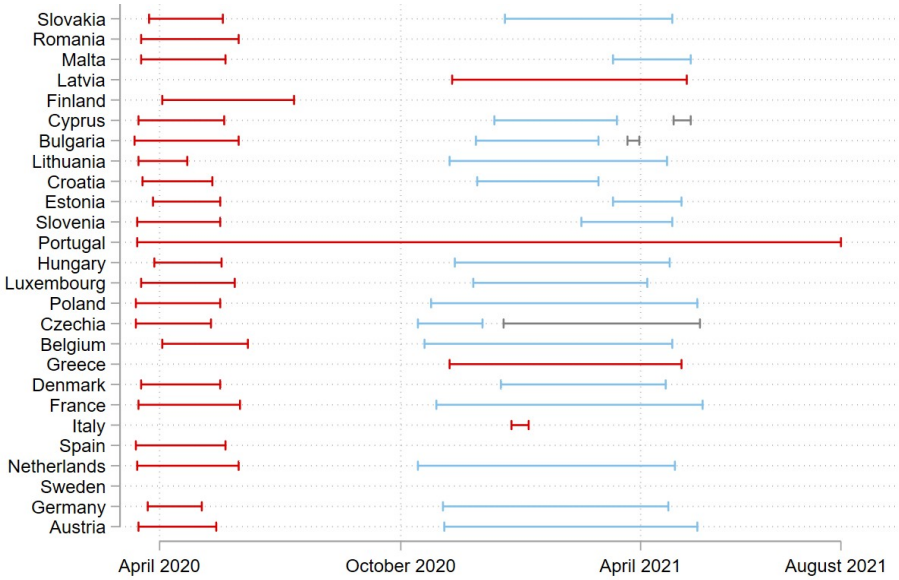
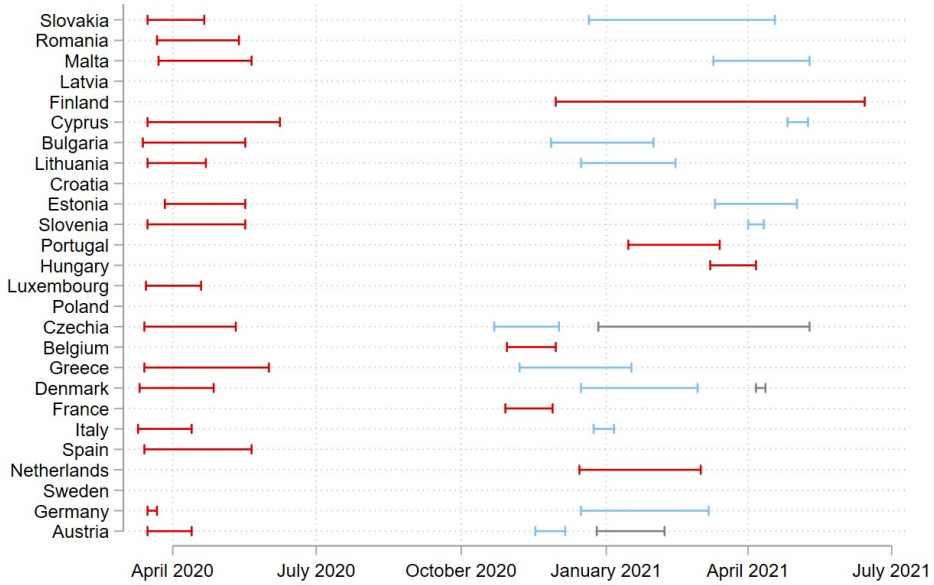


Figure 1g. Duration of closure of nonessential shops by country



Note for Figures 1a-g: Results are based on information from official government sources collected by the European Centre for Disease Prevention and Control

3.8 References

Akkermans J, Seibert S, Mol S (2018) Tales of the unexpected: integrating career shocks in the contemporary careers literature. SA j. ind. psychol. 44(0):1–10. doi: 10.4102/sajip.v44i0.1503

Ang JP, Dong F (2022) The effects and counter-effects of unemployment and stringency responses to Covid-19: an international analysis using simultaneous equations models. Appl Econ 54(11):1278–1300. doi: 10.1080/00036846.2021.1975634

Aparicio Fenoll A (2020) The uneven impact of women's retirement on their daughters' employment. Rev Econ Househ 18(3):795–821. doi: 10.1007/s11150-019-09473-y

Arulampalam W, Gregg P, Gregory M (2001) Unemployment scarring. Econ J 111(475):F577-F584. doi: 10.1111/1468-0297.00663

Ayalon L, Chasteen A, Diehl M, Levy BR, Neupert SD, Rothermund K, Tesch-Römer C, Wahl H-W (2021) Aging in times of the Covid-19 pandemic: avoiding ageism and fostering intergenerational solidarity. J Gerontol B Psychol Sci Soc Sci 76(2):e49-e52. doi: 10.1093/geronb/gbaa051

Basso G, Boeri T, Caiumi A, Paccagnella M (2020) The new hazardous jobs and worker reallocation. OECD social, employment and migration working papers no. 247. https://www.oecd-ilibrary.org/social-issues-migration-health/the-new-hazardous-jobs-and-worker-reallocation_400cf397-en

Bassoli E, Belloni M, Brugiavini A, Gao Y (2023) 12 Did the pandemic change retirement trends? In: Börsch-Supan A, Abramowska-Kmon A, Andersen-Ranberg K, Brugiavini A, Chłoń-Domińczak A, Jusot F, Laferrère A, Litwin H, Smolić Š, Weber G (eds) Social, health, and economic impacts of the COVID-19 pandemic and the epidemiological control measures. De Gruyter, pp 129–140

Bassoli E, Brugiavini A, Ferrari I (2021) Care provision at the time of the Covid-19: who suffers most? SSRN Journal(10):1–26. doi: 10.2139/ssrn.3807762

Bergmann M (ed) (2019) Share wave 7 methodology: panel innovations and life histories. Share survey of health, ageing and retirement in Europe. Munich Center for the Economics of Aging, Munich

Bergmann M, Börsch-Supan A (2021) Share wave 8 methodology: collecting cross-national survey data in times of Covid-19. Share survey of health, ageing and retirement in Europe. Munich Center for the Economics of Aging, Munich

Börsch-Supan A (2022a) Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 7. SHARE-ERIC

Börsch-Supan A (2022b) Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 8. SHARE-ERIC

Börsch-Supan A (2022c) Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 8. Covid-19 Survey 1. SHARE-ERIC

Börsch-Supan A (2022d) Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 9. Covid-19 Survey 2. SHARE-ERIC

Börsch-Supan A (2022e) Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 9. COVID-19 Survey 2 Interview Date. SHARE-ERIC

Börsch-Supan A, Abramowska-Kmon A, Andersen-Ranberg K, Brugiavini A, Chłoń-Domińczak A, Jusot F, Laferrère A, Litwin H, Smolić Š, Weber G (eds) (2023) Social, health, and economic impacts of the COVID-19 pandemic and the epidemiological control measures. De Gruyter

Börsch-Supan A, Brandt M, Hunkler C, Kneip T, Korbmacher J, Malter F, Schaan B, Stuck S, Zuber S (2013) Data resource profile: the Survey of Health, Ageing and Retirement in Europe (SHARE). Int J Epidemiol 42(4):992–1001. doi: 10.1093/ije/dyt088

Bratti M, Frattini T, Scervini F (2018) Grandparental availability for child care and maternal labor force participation: pension reform evidence from Italy. J Popul Econ 31(4):1239–1277. doi: 10.1007/s00148-017-0683-7

Brugiavini A, Buia RE, Ferrari I, Gao Y, Simonetti I (2023) 14 Work interruptions and medium-term labour market outcomes of older workers during the Covid-19 pandemic. In: Börsch-Supan A, Abramowska-Kmon A, Andersen-Ranberg K, Brugiavini A, Chłoń-Domińczak A, Jusot F, Laferrère A, Litwin H, Smolić Š, Weber G (eds) Social, health, and economic impacts of the COVID-19 pandemic and the epidemiological control measures. De Gruyter, pp 149–162

Brugiavini A, Buia RE, Simonetti I (2022) Occupation and working outcomes during the coronavirus pandemic. Eur J Ageing 19(4):863–882. doi: 10.1007/s10433-021-00651-5

Bui TTM, Button P, Picciotti EG (2020) Early evidence on the impact of coronavirus disease 2019 (Covid-19) and the recession on older workers. Public Policy Aging Rep 30(4):154–159. doi: 10.1093/ppar/praa029

Chłoń-Domińczak A, Holzer-Żelażewska D, Strzelecki PA, Taracha M (2023) 16 Changes in work performance and work losses during the Covid-19 pandemic. In: Börsch-Supan A, Abramowska-Kmon A, Andersen-Ranberg K, Brugiavini A, Chłoń-Domińczak A, Jusot F, Laferrère A, Litwin H, Smolić Š, Weber G (eds) Social, health, and economic impacts of the Covid-19 pandemic and the epidemiological control measures. De Gruyter, pp 173–184

ECDC (2022) Data on country response measures to Covid-19. https://www.ecdc.europa.eu/en/publications-data/download-data-response-measures-covid-19

Ehrlich U, Klaus D (2023) Covid-19 crisis = care crisis? Changes in care provision and care-givers' well-being during the Covid-19 pandemic. In: Simonson J, Wünsche J, Tesch-Römer C (eds) Ageing in times of the Covid-19 pandemic. Springer Fachmedien Wiesbaden, Wiesbaden, pp 99–117

Engstler H, Romeu Gordo L, Simonson J (2023) Effects of the Covid-19 crisis on the work situations of people in middle and older working age. In: Simonson J, Wünsche J, Tesch-Römer C (eds) Ageing in times of the Covid-19 pandemic. Springer Fachmedien Wiesbaden, Wiesbaden, pp 37–58

Fana M, Tolan S, Torrejon Perez S, Urzi Brancati M, Fernandez Macias E (2020) The Covid confinement measures and EU labour markets. https://publications.jrc.ec.europa.eu/repository/handle/JRC120578

Fasani F, Mazza J (2020) Immigrant key workers: their contribution to Europe's Covid-19 response. IZA Policy Paper No. 155. https://www.iza.org/publications/pp/155/immigrant-key-workers-their-contribution-to-europes-covid-19-response

Fervers L, Tobler L, Knize V, Christoph B, Jacob M (2023) Kids back to school – parents back to work? School and daycare opening and parents' employment in the early phase of the Covid-19 pandemic. J Eur Soc Policy 33(3):373–387. doi: 10.1177/09589287231176775

Filomena M (2023) Unemployment Scarring Effects: An Overview and Meta-analysis of Empirical Studies. Ital Econ J. doi: 10.1007/s40797-023-00228-4

Goda GS, Jackson E, Nicholas LH, Stith SS (2023) The impact of Covid-19 on older workers' employment and social security spillovers. J Popul Econ 36(2):813–846. doi: 10.1007/s00148-022-00915-z

Hank K, Steinbach A (2021) The virus changed everything, didn't it? Couples' division of housework and childcare before and during the corona crisis. J Fam Stud 33(1):99–114. doi: 10.20377/jfr-488

Hershbein B, Kahn LB (2018) Do recessions accelerate routine-biased technological change? Evidence from vacancy postings. AER 108(7):1737–1772. doi: 10.1257/aer.20161570

Holman D, Walker A (2021) Understanding unequal ageing: towards a synthesis of intersectionality and life course analyses. Eur J Ageing 18(2):239–255. doi: 10.1007/s10433-020-00582-7

ILO (2021) Monitoring the impact of the Covid-19 pandemic on employment in the G20. Second ILO-OECD report to respond to the G20 leaders' mandate. https://www.ilo.org/global/about-the-ilo/how-the-ilo-works/multilateral-system/g20/reports/WCMS_829961/lang--en/index.htm

Johnson RW, Butrica BA (2012) Age disparities in unemployment and reemployment during the Great Recession and recovery. Brief #03 May 2012. https://www.urban.org/sites/default/files/publication/25431/412574-age-disparities-in-unemployment-and-reemployment-during-the-great-recession-and-recovery.pdf. Accessed 19.11.23

Kelle N (2020) Combining employment and care-giving: how differing care intensities influence employment patterns among middle-aged women in Germany. Ageing Soc 40(5):925–943. doi: 10.1017/S0144686X18001423

Kong E, Prinz D (2020) Disentangling policy effects using proxy data: which shutdown policies affected unemployment during the COVID-19 pandemic? J Public Econ 189:104257. doi: 10.1016/j.jpubeco.2020.104257

König R, Seifert A (2022) Digitally savvy at the home office: computer skills of older workers during the Covid-19 pandemic across Europe. Front Sociol 7:858052. doi: 10.3389/fsoc.2022.858052

Kung CS, Zhu J, Zaninotto P, Steptoe A (2023) Changes in retirement plans in the English older population during the Covid-19 pandemic: the roles of health factors and financial insecurity. Eur J Ageing 20(1):22. doi: 10.1007/s10433-023-00770-1

Moehring K, Reifenscheid M, Weiland A (2021) Is the recession a 'shecession'? Gender inequality in the employment effects of the Covid-19 pandemic in Germany. https://osf.io/preprints/socarxiv/tzma5

Morgeson FP, Mitchell TR, Liu D (2015) Event system theory: an event-oriented approach to the organizational sciences. AMR 40(4):515–537. doi: 10.5465/amr.2012.0099

Murdock E, Filbig M, Borges Neves R (2021) Unemployment at 50+: economic and psychosocial consequences. In: Walsh K, Scharf T, V Regenmortel S, Wanka A (eds) Social exclusion in later life, vol 28. Springer International Publishing, Cham, pp 47–60

Naegele G (2021) The potentials of research and policies on active ageing: from MOPACT and EXTEND to EIWO. EIWO Working Paper No. 2, vol 3. Linköping University Electronic Press, Linköping

Neumark D, Button P (2014) Did age discrimination protections help older workers weather the great recession? J Policy Anal Manag 33(3):566–601. doi: 10.1002/pam.21762

OECD (2020a) Covid-19 and the retail sector: impact and policy responses. Tackling coronavirus (Covid-19). https://www.oecd.org/coronavirus/policy-responses/covid-19-and-the-retail-sector-impact-and-policy-responses-371d7599/

OECD (2020b) OECD employment outlook 2020. Worker security and the Covid-19 crisis. OECD

OECD (2020c) Women at the core of the fight against Covid-19 crisis. OECD policy responses to coronavirus (Covid-19). https://www.oecd.org/coronavirus/policy-responses/women-at-the-core-of-the-fight-against-covid-19-crisis-553a8269/#snotes-d4e2908

Pit S, Fisk M, Freihaut W, Akintunde F, Aloko B, Berge B, Burmeister A, Ciacâru A, Deller J, Dulmage R, Han TH, Hao Q, Honeyman P, Huber PC, Linner T, Lundberg S, Nwamara M, Punpuing K, Schramm J, Yamada H, Yap JCH (2021) Covid-19 and the ageing workforce: global perspectives on needs and solutions across 15 countries. Int J Equity Health 20(1):221. doi: 10.1186/s12939-021-01552-w

Power K (2020) The Covid-19 pandemic has increased the care burden of women and families. Sustain Sci Pract Policy 16(1):67–73. doi: 10.1080/15487733.2020.1776561

Rotenberg S, Oreper JS, Bar Y, Davids-Brumer N, Arbel I, Dawson DR (2021) Occupational disruption during the Covid-19 pandemic: the lived experience of community-dwelling older adults. Can. J. Aging 40(4):521–532. doi: 10.1017/S0714980821000465

Schmitz A, Quashie NT, Wagner M, Kaschowitz J (2022) Inequalities in caregiving strain during the Covid-19 pandemic: conceptual framework and review of the empirical evidence. Int J Care:1–14. doi: 10.1332/239788221X16592761870899

Schmitz W, Naegele L, Frerichs F, Ellwardt L (2023) Gendered late working life trajectories, family history and welfare regimes: evidence from SHARELIFE. Eur J Ageing 20(1):5. doi: 10.1007/s10433-023-00752-3

Schrover M, van der Leun J, Quispel C (2007) Niches, labour market segregation, ethnicity and gender. J Ethn Migr Stud 33(4):529–540. doi: 10.1080/13691830701265404

Smolić Š, Čipin I, Međimurec P (2023) 2 Persistence of limited access to health care for older Europeans in the course of the Covid-19 pandemic. In: Börsch-Supan A, Abramowska-Kmon A, Andersen-Ranberg K, Brugiavini A, Chłoń-Domińczak A, Jusot F, Laferrère A, Litwin H, Smolić Š, Weber G (eds) Social, health, and economic impacts of the COVID-19 pandemic and the epidemiological control measures. De Gruyter, pp 23–30

Stiemke P, Hess M (2022) Determinants of (in-)voluntary retirement: a systematic literature review. J Eur Soc Policy 32(3):348–358. doi: 10.1177/09589287221089465

Theodoropoulos N, Voucharas G (2023) 17 Containment measures and job loss: evidence from SHARE Corona surveys. In: Börsch-Supan A, Abramowska-Kmon A, Andersen-Ranberg K, Brugiavini A, Chłoń-Domińczak A, Jusot F, Laferrère A, Litwin H, Smolić Š, Weber G (eds) Social, health, and economic impacts of the COVID-19 pandemic and the epidemiological control measures. De Gruyter, pp 185–192

Turek K, Henkens K (2020) How skill requirements affect the likelihood of recruitment of older workers in Poland: the indirect role of age stereotypes. Work Employ Soc 34(4):550–570. doi: 10.1177/0950017019847943

Zamberlan A, Gioachin F, Gritti D (2022) Gender inequality in domestic chores over ten months of the UK Covid-19 pandemic: heterogeneous adjustments to partners' changes in working hours. DemRes 46:565–580. doi: 10.4054/DemRes.2022.46.19

4. Social relationships, living arrangements, and loneliness

4.1 Abstract

Oldest-old people are expected to be particularly likely to experience loneliness due to the loss of their intimate partner or of same-aged social network members. It is assumed that individuals in different living arrangements maintain different kinds of social networks because they adjust their networks to their specific needs. However, not much is known about the variation in the social networks of the oldest-old depending on their living arrangements and how this variation is related to loneliness. This is the first study that seeks to fill this research gap by examining how the composition and the size of a social network varies among the oldest-old depending on their living arrangements with a partner (coresidential partnership, living apart together (LAT) partnership, no partnership), and how this variation contributes to explain loneliness among the oldest-old. We used cross-sectional data from the representative survey NRW80+ (Quality of Life and Well-Being of the Very Old in North-Rhine Westphalia). The sample of analysis used in this study consists of 1860 respondents from the German state of North-Rhine Westphalia aged 80 years and older. Associations between social network characteristics and living arrangements were tested using $\chi 2$-tests and one-way ANOVA. Ordered logit models were used to explain loneliness. Respondents in a coresidential partnership maintained larger social networks than those in an LAT partnership and those with no intimate partner. Furthermore, the respondents with no partner maintained more diverse social networks. Compared to those in the other living arrangements, the respondents in an LAT partnership maintained the smallest and least diverse social networks. Being in a coresidential partnership and the social network size were found to be negatively associated with loneliness. First, the results indicate that respondents who do not have a partner adjusted their social networks to meet their needs in the absence of this relationship. Second, we conclude that being in a coresidential partnership and having a large social network protects the oldest-old against loneliness.

4.2 Introduction

Social relationships are crucial for the well-being of the very old. Two sociological concepts are essential to describe the structures of social relationships: social networks and living arrangements. While the social network can be described by its functional (e.g., social support) and its structural characteristics (e.g., size, composition) (Ellwardt and Hank 2019), this article is focused on the latter. Living arrangements are understood as patterns of social relationships with people with whom the individual lives and share their everyday life (Kreyenfeld and Konietzka 2015). Most notably, the relationship with an intimate partner is strongly associated with well-being in old age, as having a partner can prevent loneliness (Dykstra and Jong Gierveld 2004, Pinquart 2003, Sundström et al. 2009). Loneliness is defined as the feeling that there is a discrepancy between the actual and the desired quality and quantity of an individual's social relationships. The feeling of missing an attachment figure (e.g. intimate partner) is defined as emotional loneliness, whereas the feeling of missing a broader social network (e.g. friends) is understood as social loneliness (Gierveld and van Tilburg 2006). Overall, loneliness is known to jeopardize a person's health and well-being (Hawkley and Cacioppo 2010). This article examines the association between an individual's egocentric social network, which describes the connections between the individual and a set of other people (Ellwardt and Hank 2019) and the person's living arrangement with an intimate partner. Moreover, we investigate how the structure of the social relationships of very old people influences their feelings of loneliness. Thus, based on the framework "Challenges and Potentials Model of Quality of Life in Very Old Age (CHAPO)" (Wagner et al. 2018), we focus on the social conditions that underlie successful life conduct.

Although feelings of loneliness increase slightly after the age of 70 years, especially for women, the overall risk of experiencing loneliness is low among the oldest-old (Huxhold and Engstler 2019). Based on socioemotional selectivity theory, a possible explanation for the low risk of loneliness in very old age is that only a few close relationships, such as the relationship with a partner, might be satisfying enough for the emotional needs of the oldest-old (Carstensen 1992). Living with a partner is associated with experiencing fewer feelings of loneliness (Sundström et al. 2009), whereas living alone and being widowed are substantial risk factors for experiencing loneliness (Brittain et al. 2017, Greenfield and Russell 2011). However, the proportion of people who are widowed or are living without a partner are higher among those aged ≥80 years than they are among younger age groups (Lengerer 2016, Nowossadeck and Engstler 2013, Statistisches Bundesamt 2015). Among people aged 80+, 70% of men and only

20% of women are living in a coresidential partnership (Lengerer 2016). In addition, very old people are especially likely to live in a living-apart-together (LAT) partnership. This living arrangement may be seen as an alternative to forming a more institutionalized partnership after the loss of a spouse (Jong Gierveld 2004), or it may occur because one of the former coresidential partners has moved to an institutional care setting (Mauritz and Wagner 2021).

Moreover, it is well-known that social inequality, the the type of living arrangement and loneliness are related to each other. For example, among the oldest-old, higher educated men are more likely than lower educated men to be in a coresidential partnership (Lengerer 2016). Higher educated persons are also less likely to feel lonely (Pinquart and Sorensen 2001).

A possible strategy for dealing with the challenges of being in a LAT partnership or of having no intimate partner (e.g., the lack of social support) is to extend the social network. The hierarchical-compensatory model assumes that individuals compensate for the loss or the absence of a potential social support source by becoming more involved with other social network members (e.g., children) (Cantor 1979). Thus, individuals who live apart from their partner or who lack a partner may be expected to have a different set of social relationships than people who are in a coresidential partnership. However, the empirical results on this issue are fragmentary, and are often focused on marital status. It has been shown that among oldest-old people in Germany, those who have no partner maintain a more diverse social network by including more non-kin relationships in their social network, whereas those who have a partner report having a larger network size (Huxhold et al. 2010, Wagner et al. 1999). Moreover, after people are widowed their contact to all types of network members, particularly to children and siblings, tends to increase (Guiaux et al. 2007).

For older people without a partner, their children, grandchildren, and siblings are especially valuable sources of social support (Suitor et al. 2016). However, having a non-kin network of friends and acquaintances, as well as a bigger network size is also important for older people, as these relationships enable them to engage in social activities and to exchange information (Böger et al. 2017). In line with the hierarchical compensatory model, having children, siblings, friends, and neighbors provides greater protection from loneliness for unmarried people than for married people (Pinquart 2003). Nonetheless, older people who lack a partner and who live with their children or with other family members are as likely to report feeling lonely as older people who live in a single-person household (Greenfield and Russell 2011). Overall, the number of friends and acquaintances people have is more strongly

associated with loneliness than the number of family members they have (Pinquart and Sorensen 2001).

However, most existing research on this topic focuses either on social networks or on living arrangements but does not view them as mutually dependent. Thus, up to now, it is largely unknown how the social networks of the oldest-old vary depending on their living arrangements. Most of these studies focus on marital and coresidential partnerships (Pinquart and Sorensen 2001, Pinquart 2003, Lengerer 2016), or concentrate on living alone as a risk factor of loneliness, without considering other kinds of living arrangements with the partner (Brittain et al. 2017, Sundström et al. 2009). Moreover, little is known about the association of loneliness with various relationship types among the oldest-old, because most studies only examine single relationship characteristics like the number of friends or children (Luhmann and Bücker 2019).

Our study aims to fill this research gap by examining how the living arrangements of the oldest-old are related to their social embeddedness and to what extent both their living arrangements and social embeddedness are associated with loneliness. By contributing representative insights into these issues and considering different living arrangements of the oldest-old, this study seeks to tackle the stated shortcomings of previous research.

4.3 Method and measurements

In this study, we use cross-sectional data from the representative survey "Quality of Life and Well-Being of the Very Old in North Rhine-Westphalia" (Wagner et al. 2018) (NRW80+, n=1,863). The target population of the NRW80+ study comprised individuals aged 80 and above, defined by a birthdate prior to August 1, 1937, who are registered residents of North Rhine-Westphalia. This includes individuals residing in private households as well as those in institutional care. The data was colleced in 2017. As we dropped 3 cases because of ambiguous information, the final sample consists of 1,860 observations, including 176 proxy interviews and 211 interviews with nursing home residents. The shares of missing values were highest for the variables on depression (7.3%) and education (7.2%). We used multiple imputation to substitute missing values for 323 observations (17.4%). All variables with missing values were imputed. Since gender has no missing values, the variable was not imputed. The imputation

model was predicted by gender and type of residence (institutional care/private household). Both the imputed and the original dataset led to the same results.

In this article, we present a descriptive overview of the respondents' living arrangements by the size and the composition of their social networks and their levels of education. These associations are tested using one-way ANOVA and corrected weighted Pearson Chi² statistics. In a second step, we use ordered logit models to examine how the respondents' social network sizes, relationship types, and living arrangements are related to their levels of loneliness. We use depression, education, gender, and age as controls. All statistical models and descriptive statistics are adjusted for the two-stage survey design of our data.

The social network size was measured by asking each respondent for the names of up to four of the most important people in his/her life, and varied from zero to four. Furthermore, the respondents could specify the type of social relationship (e.g., partner, children) for each of these individuals. For each relationship type that was mentioned in the social network, we generated a dichotomous variable that was coded one if the relationship type was reported, and was coded zero if it was not reported. We distinguish between five categories: children and grandchildren, siblings, other family members, friends and acquaintances.

The respondents' living arrangements were measured by their partnership status, household composition, and type of residence. If a respondent reported the presence of a partner when asked about the household composition, the respondent was considered to be in a coresidential partnership. If a respondent did not list a partner when asked about the composition of the household, or stated that they lived institutional care, the respondent was considered to be in a LAT partnership (Mauritz and Wagner 2021). Therefore, we can differentiate between three living arrangements: a coresidential partnership, a LAT partnership, and living without a partner.

Loneliness was measured by the item: "How often did you feel lonely in the last week?" ("Wie oft haben Sie sich in der letzten Woche einsam gefühlt?") , with an ordinal scale ranging from one to four. Higher values mean that the respondent felt lonely more frequently (see Table 1 in the appendix).

The levels of depression were measured using four dichotomous items (e.g., can enjoy life), which were summed up and ranged from one to four, with higher values indicating higher levels of depressive symptoms. Education was measured by differentiating between three levels: level 1 includes primary or lower secondary education; level 2 includes upper secondary or post-secondary non-tertiary education; and level 3 indicates those with a bachelor, master,

or doctoral degree or equivalent. More details on the descriptive characteristics of the sample (Table 1) are provided in the appendix.

4.4 Results

Table 2 describes the living arrangements by network size, network composition and educational levels. The last column on the right depicts the F-statistics, which tested (1) the association between living arrangements and social network relationship types and educational levels; and (2) the differences in the means of the social network size by living arrangements.

Table 2. Distribution of social network characteristics and educational level by living arrangements

	Living arrangement			
	Coresidential partnership	*Living-apart-together partnership*	*No partnership*	
		M (SE), %		*F*
Social network				
Size	3.4 (0.1)	2.7 (0.2)	3.0 (0.1)	26.3***
Children and grandchildren	79.0	66.4	75.4	2.7
Siblings	11.2	5.4	16.4	6.4**
Other family members	25.1	30.1	38.8	13.4***
Friends	13.0	11.2	16.4	1.6
Acquaintances	10.4	10.2	20.2	10.1***
Education (ISCED 2011)				18.9***
Low	16.2	22.1	35.6	
Intermediate	56.6	53.7	50.7	
High	27.2	24.3	13.7	
Total	35.5	5.2	59.3	
N	660	97	1103	

Note: NRW80+; n=1,860; weighted data; * p<0.05; ** p<0.01; *** p<0.001.

The results show that the respondents who were in a coresidential partnership maintained larger social networks than the respondents who had no partner, and that the respondents who were in a LAT partnership had the smallest networks. No significant associations can be found between the respondents' living arrangements and whether there were children, grandchildren, or friends in their social networks. However, the respondents who had no partner were more likely than those in other living arrangements to list siblings, other family members or acquaintances as social network members.

Significant educational differences can also be observed between the respondents in different living arrangements. The proportion of people who were highly educated was greater among those who were living in a coresidential partnership, whereas the respondents with low levels of education were more likely to have no partner.

Table 3. Results of ordered logistic regression for loneliness

	Model 1		Model 2	
Variable	ß (SE)	95% C.I.	ß (SE)	95% C.I.
Living arrangement				
(Ref. No partner)				
Coresidential partnership	-1.39*** (0.17)	−1.73 −1.05	−1.25*** (0.17)	−1.58 −0.91
LAT partnership	0.14 (0.30)	−0.45 0.74	0.20 (0.30)	−0.40 0.80
Social network				
Size	-	-	−0.24** (0.07)	−0.37 −0.10
Children and grandchildren	−0.24 (0.16)	−0.56 0.08	0.14 (0.20)	−0.26 0.53
Siblings	−0.26 (0.25)	−0.74 0.23	−0.08 (0.26)	−0.59 0.43
Other family members	−0.13 (0.15)	−0.42 0.16	0.08 (0.15)	−0.21 0.38
Friends	−0.19 (0.22)	−0.62 0.24	−0.02 (0.22)	−0.46 0.42
Acquaintances	−0.33 (0.20)	−0.73 0.07	−0.14 (0.21)	−0.56 0.27
F	19.32***		19.34***	
N	1860		1860	

SE Standard error, CI Confidence interval, LAT Living apart together, β Unstandardized coefficient

Note: NRW80+; weighted data; Both models control for depression, age, gender and education; +p<0.100 * p<0.05; ** p<0.01; *** p<0.001.

The results of the ordered logit models for loneliness are shown in Table 3. The full results including control variables (depression, age, gender, education) and the thresholds are provided in Table 4 in the appendix. In model 1, we found a significant association between loneliness and being in a coresidential partnership. The respondents living in a coresidential partnership were less likely to report feeling lonely than those who did not have an intimate partner. The respondents who were in a LAT relationship, by contrast, did not seem to differ in their levels of loneliness from those who had no partner. Model 2 also included the size of the social network, which improved the modelt fit ($F = 11.42$, $p = 0.001$). We found that having a larger social network size was associated with a lower likelihood of feeling lonely. The previously described association between being in a coresidential partnership and loneliness remained significant when the social network size was included. Additionally, we found that more depressive symptoms and increasing age are related to a higher risk of loneliness.

4.5 Discussion

This study has provided an overview of the living arrangements and social networks among the oldest-old population in the most-populated state of Germany, and their associations with loneliness. Using representative cross-sectional data of respondents aged 80 years and older, we found evidence that individuals without a partner coped with the lack of a partnership by increasing their investments in alternate relationship types. In line with the assumptions of the hierarchical compensatory model, our results indicated that compared to people in other living arrangements, individuals without a partner maintained a shifted hierarchy of social relationships with a broader range of social relationship types, such as relationships with siblings, other family members, and acquaintances.

However, we also found that compared to their counterparts in other living arrangements, the respondents who were in a coresidential partnership had larger social networks. This finding contradicts the claims of the hierarchical compensatory model. We assume that compared to the individuals who were in an LAT partnership or who had no partner, those in a coresidential partnership were more likely to be introduced to new social relationships through their partner. Moreover, the respondents in a coresidential partnership might have been more integrated into a broader family with children.

Furthermore, compared to the respondents in other types of living arrangements, those who were in a coresidential partnership had higher levels of education, in line with previous research

(Jong Gierveld 2004, Lengerer 2016). We assume that people with less education were more likely to have experienced the death of a spouse or to have moved to an institutional care setting (Martikainen et al. 2008).

Moreover, we found that compared to the individuals in other living arrangements, the respondents who were in an LAT partnership had both a smaller network size and a less diverse network composition. A possible explanation for this finding is that some of these oldest-old people were living in an institutional care setting where they were no longer in close proximity to their former community, which impedes personal contact with their network members.

One of our main findings is the association between living in a coresidential partnership, having a larger social network size and being less lonely. People living in an LAT partnership were as lonely as those who had no partner. In light of these findings, our first conclusion is that when seeking to prevent loneliness among the oldest-old, it is crucial to take into account whether an individual shares his/her household with a partner. Second, we speculate that having a larger number of social network members provides the oldest-old with more access to social support and opportunities to engage in social activities, which may result in less loneliness (Dykstra and Jong Gierveld 2004). Finally, we note that the strong association we found between being in a coresidential partnership and loneliness can also be interpreted in reference to the socioemotional selectivity theory, which states that the oldest old find emotionally close relationships the most rewarding (Carstensen 1992). Our findings on the association between partnership status, the size and the composition of the social network, and loneliness are supported by previous research (Dahlberg et al. 2018, Dykstra and Jong Gierveld 2004, Pinquart 2003, Pinquart and Sorensen 2001). Additionally, we found that age and depression are related to loneliness among the oldest-old. We, therefore, conclude that feelings of loneliness are more likely with increasing age (Huxhold and Engstler 2019) and that experiencing depressive symptoms might strengthen feelings of loneliness (Cacioppo et al. 2010).

However, our study was unable to identify the mechanisms (e.g., the preferences and needs of the individuals) that underlie the associations between living arrangements, social network characteristics, and loneliness. Moreover, we had no information on the quality of each social relationship type. Prior research has shown that loneliness differs by the perceived quality and quantity of social relationships (Hawkley et al. 2008, Pinquart 2003). Thus, having a partner does not necessarily result in better well-being, because this association depends for example on the satisfaction with the reciprocity of the relationship (Hank and Wagner 2013).

Furthermore, as the data did not include information on types of social relationships for more than four people, we were unable to draw a full picture of the composition of the social networks among the oldest-old people in our sample, especially for the respondents who named their partner as one of the four social network members. Finally, as our study was based on cross-sectional data, we were unable to draw causal conclusions. These limitations should be addressed in future research.

4.6 Conclusion with practical recommendations

- Having a coresidential partner and being socially embedded in a larger number of social relationships can prevent loneliness.
- People who have no partner or who are in a LAT relationship are at additional risk of loneliness because they tend to have a smaller social network than people who have a coresidential partner.
- For the oldest-old who lack a partner or who are in a LAT relationship, interventions designed to enhance their opportunities to establish new social contacts are needed.

4.7 Appendix

Table 1. Descriptive characteristics of the sample by age and gender

	80 – 84		*85-89*		*90+*	
	Men	*Women*	*Men*	*Women*	*Men*	*Women*
	M (SE) or %					
Living arrangement						
Coresidential partnership	73.2	29.5	54.6	13.0	43.2	4.0
Living-apart-together partnership	5.2	5.8	10.9	3.0	7.0	1.9
No partnership	21.6	64.8	34.5	84.0	50.0	94.1
Social network						
Size (0-4)	3.1 (0.1)	3.2 (0.1)	3.2 (0.1)	3.2 (0.1)	2.9 (0.1)	2.8 (0.1)
Children and grandchildren	73.6	79.5	77.2	77.6	67.6	72.2
Siblings	13.7	17.0	11.1	15.3	7.8	9.8
Other family members	27.0	30.3	29.0	42.7	36.9	40.3
Friends	14.4	20.6	9.7	13.4	8.1	11.0
Acquaintances	12.0	17.2	18.2	17.6	17.8	16.4
Education (ISCED 2011)						
Low	8.7	34.0	10.5	42.9	10.1	42.7
Intermediate	56.4	54.7	52.5	48.1	59.5	48.2
High	34.8	11.3	37.0	9.0	30.4	9.1
Well-being						
Loneliness						
Never or almost never	84.9	74.4	73.6	69.5	64.6	64.3
Sometimes	11.7	20.4	19.5	23.2	26.2	25.0
Often	1.8	2.8	3.9	4.7	6.1	6.7
Always or almost always	1.6	2.4	2.9	2.6	3.1	4.1
Depression (0-4)	0.8 (0.1)	0.9 (0.1)	0.8 (0.1)	1.0 (0.1)	1.0 (0.1)	1.1 (0.1)
Total	58.9	48.6	30.0	31.2	11.1	20.2
N	396	577	202	370	75	240

Note: NRW80+; n=1,860; weighted data.

Table 4. Complete results of ordered logistic regression for loneliness

	Model 1		Model 2	
Variable	ß (SE)	95% C.I.	ß (SE)	95% C.I.
Living arrangement				
(Ref. No partner)				
Coresidential partnership	-1.39*** (0.17)	-1.73 -1.05	-1.25*** (0.17)	-1.58 -0.91
LAT partnership	0.14 (0.30)	-0.45 0.74	0.20 (0.30)	-0.40 0.80
Social network				
Size	-	-	-0.24** (0.07)	-0.37 -0.10
Children and grandchildren	-0.24 (0.16)	-0.56 0.08	0.14 (0.20)	-0.26 0.53
Siblings	-0.26 (0.25)	-0.74 0.23	-0.08 (0.26)	-0.59 0.43
Other family members	-0.13 (0.15)	-0.42 0.16	0.08 (0.15)	-0.21 0.38
Friends	-0.19 (0.22)	-0.62 0.24	-0.02 (0.22)	-0.46 0.42
Acquaintances	-0.33 (0.20)	-0.73 0.07	-0.14 (0.21)	-0.56 0.27
Controls				
Depression	0.73*** (0.07)	0.60 0.87	0.73*** (0.07)	0.60 0.86
Age	0.03* (0.01)	0.00 0.06	0.03* (0.01)	0.00 0.06
Gender *(Ref. Men)*	-0.11 (0.16)	-0.43 0.20	-0.08 (0.16)	-0.39 0.23
Education *(Ref. Low)*				
Intermediate	0.11 (0.19)	-0.27 0.48	0.12 (0.19)	-0.25 0.49
High	0.11 (0.24)	-0.36 0.58	0.15 (0.23)	-0.31 0.61
Cut 1	3.83 (1.28)	1.30 6.36	3.55 (1.28)	1.02 6.07
Cut 2	5.83 (1.29)	3.28 8.38	5.56 (1.29)	3.01 8.11
Cut 3	6.85 (1.32)	4.22 9.48	6.59 (1.33)	3.95 9.22
F	19.32***		19.34***	
N	1860		1860	

Note: NRW80+; weighted data; +p<0.100 * p<0.05; ** p<0.01; *** p<0.001.

4.8 References

Böger A, Huxhold O, Wolff JK (2017) Wahlverwandtschaften: Sind Freundschaften für die soziale Integration wichtiger geworden? In: Mahne K, Wolff JK, Simonson J, Tesch-Römer C (eds) Altern im Wandel. Springer Fachmedien Wiesbaden, Wiesbaden, pp 257–271

Brittain K, Kingston A, Davies K, Collerton J, Robinson L, Kirkwood T, Bond J, Jagger C (2017) An investigation into the patterns of loneliness and loss in the oldest old – Newcastle 85+ Study. Ageing Soc 37(1):39–62. doi: 10.1017/S0144686X15001142

Cacioppo JT, Hawkley LC, Thisted RA (2010) Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. Psychol Aging 25(2):453–463. doi: 10.1037/a0017216

Cantor MH (1979) Neighbors and friends. Res Aging 1(4):434–463. doi: 10.1177/016402757914002

Carstensen LL (1992) Social and emotional patterns in adulthood: support for socioemotional selectivity theory. Psychol Aging 7(3):331–338. doi: 10.1037/0882-7974.7.3.331

Dahlberg L, Agahi N, Lennartsson C (2018) Lonelier than ever? Loneliness of older people over two decades. Arch Gerontol Geriatr 75:96–103. doi: 10.1016/j.archger.2017.11.004

Dykstra PA, Jong Gierveld J de (2004) Gender and marital-history differences in emotional and social loneliness among Dutch older adults. Can J Aging 23(2):141–155. doi: 10.1353/cja.2004.0018

Ellwardt L, Hank K (2019) Soziale Netzwerke im Alter. In: Hank K, Schulz-Nieswandt F, Wagner M, Zank S (eds) Alternsforschung. Nomos Verlagsgesellschaft mbH & Co. KG, pp 339–356

Gierveld JDJ, van Tilburg T (2006) A 6-Item scale for overall, emotional, and social loneliness. Res Aging 28(5):582–598. doi: 10.1177/0164027506289723

Greenfield EA, Russell D (2011) Identifying living arrangements that heighten risk for loneliness in later life. J Appl Gerontol 30(4):524–534. doi: 10.1177/0733464810364985

Guiaux M, van Tilburg T, van Broese Groenou M (2007) Changes in contact and support exchange in personal networks after widowhood. Pers Relatsh 14(3):457–473. doi: 10.1111/j.1475-6811.2007.00165.x

Hank K, Wagner M (2013) Parenthood, marital status, and well-being in later life: evidence from SHARE. Soc Indic Res 114(2):639–653. doi: 10.1007/s11205-012-0166-x

Hawkley LC, Cacioppo JT (2010) Loneliness matters: a theoretical and empirical review of consequences and mechanisms. Ann Behav Med 40(2):218–227. doi: 10.1007/s12160-010-9210-8

Hawkley LC, Hughes ME, Waite LJ, Masi CM, Thisted RA, Cacioppo JT (2008) From social structural factors to perceptions of relationship quality and loneliness: the Chicago health, aging, and social relations study. J Gerontol B Psychol Sci Soc Sci 63(6):S375-84. doi: 10.1093/geronb/63.6.S375

Huxhold O, Engstler H (2019) Soziale Isolation und Einsamkeit bei Frauen und Männern im Verlauf der zweiten Lebenshälfte. In: Vogel C, Wettstein M, Tesch-Römer C (eds) Frauen und Männer in der zweiten Lebenshälfte. Springer Fachmedien Wiesbaden, Wiesbaden, pp 71–89

Huxhold O, Mahne K, Naumann D (2010) Soziale Integration. In: Motel-Klingebiel A, Wurm S, Tesch-Römer C (eds) Altern im Wandel. Befunde des Deutschen Alterssurvey (DEAS). Kohlhammer, Stuttgart, pp 215–233

Jong Gierveld J de (2004) Remarriage, unmarried cohabitation, living apart together: partner relationships following bereavement or divorce. J of Marriage and Family 66(1):236–243. doi: 10.1111/j.0022-2445.2004.00015.x

Kreyenfeld M, Konietzka D (2015) Sozialstruktur und Lebensform. In: Hill PB, Kopp J (eds) Handbuch Familiensoziologie. Springer Fachmedien Wiesbaden, Wiesbaden, pp 345–373

Lengerer A (2016) Partnerschaftliches Zusammenleben im Alter. In: Stauder J, Rapp I, Eckhard J (eds) Soziale Bedingungen privater Lebensführung. Springer Fachmedien Wiesbaden, Wiesbaden, pp 15–40

Luhmann M, Bücker S (2019) Einsamkeit und soziale Isolation im hohen Alter. https://hss-opus.ub.ruhr-uni-bochum.de/opus4/frontdoor/index/index/docId/6373

Martikainen P, Nihtilä E, Moustgaard H (2008) The effects of socioeconomic status and health on transitions in living arrangements and mortality: a longitudinal analysis of elderly finnish men and women from 1997 to 2002. J Gerontol B Psychol Sci Soc Sci 63(2):S99-109. doi: 10.1093/geronb/63.2.S99

Mauritz S, Wagner M (2021) LAT relationships: a new living arrangement among the oldest old population in Germany? Dem Res 44:349–362. doi: 10.4054/DemRes.2021.44.14

Nowossadeck S, Engstler H (2013) Familie und Partnerschaft im Alter. (Report Altersdaten, 3/2013). https://www.ssoar.info/ssoar/bitstream/handle/document/37025/ssoar_2013_Nowossadeck-Engstler_Familie-und-Partnerschaft-im-Alter.pdf?sequence=3

Pinquart M (2003) Loneliness in married, widowed, divorced, and never-married older adults. J Soc Pers Relat 20(1):31–53. doi: 10.1177/02654075030201002

Pinquart M, Sorensen S (2001) Influences on loneliness in older adults: a meta-analysis. Basic Appl Soc Psychol 23(4):245–266. doi: 10.1207/S15324834BASP2304_2

Statistisches Bundesamt (2015) Die Generation 65+ in Deutschland. https://www.destatis.de/GPStatistik/servlets/MCRFileNodeServlet/DEMonografie_derivate_00001454/Generation65.pdf.

Suitor JJ, Gilligan M, Pillemer K (2016) Stability, change, and complexity in later-life families. In: Handbook of Aging and the Social Sciences. Elsevier, pp 205–226

Sundström G, Fransson E, Malmberg B, Davey A (2009) Loneliness among older Europeans. Eur J Ageing 6(4):267. doi: 10.1007/s10433-009-0134-8

Wagner M, Rietz C, Kaspar R, Janhsen A, Geithner L, Neise M, Kinne-Wall C, Woopen C, Zank S (2018) Lebensqualität von Hochaltrigen : Studie zu Lebensqualität und subjektivem Wohlbefinden hochaltriger Menschen in Nordrhein-Westfalen (NRW80+) (Quality of life of the very old : Survey on quality of life and subjective well-being of the very old in North Rhine-Westphalia (NRW80+)). Z Gerontol Geriatr 51(2):193–199. doi: 10.1007/s00391-017-1217-3

Wagner M, Schütze Y, Lang FR (1999) Social relationships in old age. In: Baltes PB, Mayer KU (eds) The Berlin Aging Study. Aging from 70 to 100. Cambridge University Press, Berlin, pp 282–301