Parent-child relationships and older adults' (mental) health in Europe and the United States

Inauguraldissertation

zur

Erlangung des Doktorgrades

der

Wirtschafts- und Sozialwissenschaftlichen Fakultät

der

Universität zu Köln

2024

vorgelegt von

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aus

Wittlich

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Tag der Promotion: 18. März 2025

Acknowledgements

This dissertation would not have been possible without the financial support of the Cologne Graduate School in Management, Economics, and Social Science, which awarded me a scholarship to pursue my PhD within the Key Research Initiative 'Demography & Social Inequality'. Equally important, if not more so, was the constant (informational *and* emotional!) support I received from many wonderful people: First of all, I would like to thank my advisors Karsten Hank and Lea Ellwardt. Not only did they give me the opportunity to start this journey from the very beginning, but they were always willing to listen and help me through its' ups and downs. They gave me the freedom to explore my own research interests while guiding me with their invaluable wisdom. I would particularly like to thank Karsten for being a great mentor, supporting me with his expertise on the topic and insights on the academic life while teaching me the right amount of pragmatism. I am also deeply grateful to Lea for guiding me through the early stages of my PhD and for teaching me how to develop a solid research design. I am truly happy that both of you will be part of my Post-Doc chapter as well!

I would also like to thank my co-authors, Valeria Bordone, Karsten Hank, and Deborah Carr. The dissertation would not have been possible without their important contributions, from brainstorming and refining research ideas to working through analyses and revising drafts together – again and again. Throughout the process of writing the four manuscripts and the introduction to this dissertation, I have received insightful feedback from both my advisors, and Nekehia Quashie, as well as the editors and reviewers of the many journals involved in these projects.

As my collaborators, Valeria and Debby invited me to work with them at the University of Vienna and Boston University. I am deeply grateful for all that I have learned from them and for their support during my time in Vienna, Boston, and beyond. My special thanks go to Karsten and the German Academic Exchange Service for supporting these research visits, and to everyone who made my experiences in Vienna and Boston truly unforgettable.

Despite the occasional travel challenges with the Deutsche Bahn, I always looked forward to coming to Cologne because of my wonderful colleagues and friends – Bettina Hünteler, Amelie Reiner, Paula Steinhoff, Katya Sytkina, Lina Tobler, and many others with whom I've shared many enjoyable lunch breaks and memorable off-campus activities. I also want to extend my thanks to Petra Altendorf, the Geschäftszimmer team, particularly Joël Binckli and André Ernst, and the IT support. Additionally, I am grateful to my former colleagues from TU Dortmund, especially Martina Brandt, Nekehia Quashie, and Alina Schmitz, who showed me how fun science can be.

Last but not least, I want to thank my childhood friends from Cologne, my friends from the Ruhrpott, and especially Luca for always being there for me. Mum, René, and Opa, thank you for your unwavering belief in me.

Contents

Chapter 1

Introduction

1.1. Background and aim of this dissertation

In later life, relationships with *adult children*, alongside spouses, are among the most vital, serving as key sources of support (Agree & Glaser, 2009). Despite discussions about a "decline of the nuclear modern family" in recent decades (Bengtson, 2001), the bond between parents and adult children (hereafter referred to as parent-child relationships) in contemporary Western societies has remained strong (e.g., Steinbach et al., 2020).

Given the ongoing trend of population aging (Eurostat, 2024), older adults' mental and physical health is gaining political and societal importance (World Health Organization, 2015). A substantial body of research has examined how parent-child relationships serve as key determinants of older adults' mental and physical health (among many others, for instrumental help: Djundeva et al., 2015; Thomas, 2010; for geographic proximity: Caputo & Cagney, 2023; van der Pers et al., 2015; for contact frequency: Buber & Engelhardt, 2008; Tosi & Grundy, 2019). However, the findings have been mixed. Whereas some scholars have emphasized the importance of strong parent-child relationships for older adults' mental and physical health (Carr & Utz, 2020; Fingerman et al., 2020), others have suggested that there can be "too much of a good thing," indicating that excessive involvement in each other's lives can be detrimental to parents and their adult children (Bordone, 2015; Caputo, 2019; Luo et al., 2022; Silverstein et al., 1996).

The ambiguity in the findings on parent-child relationships and older adults' (mental) health may stem from the different indicators used in different cultural contexts; however, a major methodological flaw is the neglect of *reverse causality* and *omitted variable bias* (Allison et al., 2017). This oversight leaves uncertainty about whether parent-child relationships influence older adults' mental and physical health or if, conversely, these relationships change in response to the deteriorating mental and physical health of aging parents. In addition, this oversight leads to biased results by omitting crucial (time-invariant) variables that could confound the association, such as childhood experiences or personality traits.

Moreover, research indicates that *weakened* parent-child relationships can have a more significant effect on parental mental health than strong parent-child relationships because of their scarcity and emotional distress (Rook, 2015). A parent's well-being can suffer if just one child has a strained relationship with the parent (Fingerman et al., 2012). Much research has focused on ambivalent parent-child relationships (i.e., simultaneously experiencing positive and negative emotions; see, for example, Fingerman et al., 2008; Lee & Szinovacz, 2016), but less research has examined how weakened parent-child relationships can affect the mental health of older adults (Hank, 2024). Recent research has revealed one particularly important dimension of weakened parent-child relationships: disconnectedness (Kalmijn, 2023; Lin et al., 2024). Parent-child disconnectedness refers to the lack of contact with at least one child and is similar to the concept of estrangement (Reczek et al., 2023).

However, not all parents may be equally affected by parent-child disconnectedness. Disconnectedness may be especially harmful for parents in stable marriages because of its rarity and associated stigma (Pillemer, 2020). Alternatively, parents who have never married or whose partnerships have dissolved may be more susceptible to parent-child disconnectedness because they often have smaller support networks (Swartz, 2009) while potentially requiring more support (Lin et al., 2024). Furthermore, mothers, who typically report stronger bonds with their children, may experience greater stigma from disconnectedness (Fingerman et al., 2020). However, to date, no studies have explored the prevalence or mental health impacts of parent-child disconnectedness across *different marital statuses for men and women.*

Moreover, weakened parent-child relationships are likely to be especially harmful during critical life transitions when individuals require strong support networks to navigate challenges associated with the transition. A particularly vulnerable transition in later life is the "silver split" – separation at or after age 50 – a trend that has recently increased in many contemporary societies (Alderotti et al., 2022; Brown & Lin, 2022). A silver split can introduce challenges for older adults, such as relocating, facing financial difficulties, or experiencing increasing loneliness (Kapelle & Monden, 2024; Lin & Brown, 2021). Parent-child disconnectedness may exacerbate these challenges, placing a double mental health burden on individuals experiencing a silver split (Lin et al., 2024). However, research on parent-child disconnectedness during a silver split in Europe is limited, leaving its impact on mental health among *older European adults* unclear. Moreover, existing studies often use cross-sectional or multilevel models, which may not adequately account for *omitted variable bias.*

Against this background, this dissertation aims to deepen our understanding of the (inter)relationship between parent-child relationships and older adults' mental and physical health through two primary objectives. *First*, it employs a more rigorous methodological approach to examine the interrelationship between parent-child relationships and older adults' mental and physical health, with a focus on two key dimensions: (a) instrumental help and (b) geographic proximity. *Second*, it examines how parent-child disconnectedness, or weakened parent-child relationships, is linked to and affects the mental health of older European adults, for (a) men and women with different marital statuses and (b) silver splitters. In this dissertation, older adults' mental and physical health was assessed through self-rated health in Study 1 and depressive symptoms in Studies 2 to 4. To explore these objectives, this dissertation draws on data from three longitudinal aging surveys: the German Ageing Survey (DEAS); the Health and Retirement Study (HRS); and the Survey of Health, Ageing and Retirement in Europe (SHARE).

In the following, I *first* outline the context of parent-child relationships against the background of population aging. *Second*, I discuss the core assumptions and theories behind my four studies: a) the impact of parent-child relationships on older adults' mental and physical health, b) mental and physical health as determinants of these relationships, and c) the role of parent-child disconnectedness. *Third*, I summarize the four studies that make up this dissertation. *Finally*, I conclude by highlighting the key findings, contributions, limitations, and implications for future research and policy. Chapters 2, 3, 4, and 5 present the four empirical studies.

1.2. Setting the scene: Parent-child relationships in aging populations

Family relationships are central to the reproduction of social inequality by shaping access to resources, opportunities, and support across generations (Jessee et al., 2024). As such, they play an important role in individual well-being and can influence health inequalities (Carr & Utz, 2020; Thomas et al., 2017). Demographic shifts have significantly altered the structure of families in recent decades. In many contemporary Western societies, declining fertility rates and increasing life expectancies (Eurostat, 2024) have shifted family structures, emphasizing *vertical* connections or intergenerational relationships (grandparents, parents, children) over *horizontal* connections (such as siblings, aunts, and uncles). Bengtson (2001) described this transformation as a shift "from pyramid to beanpole." Such changes may potentially intensify the intergenerational transmission of social inequalities, as resources are distributed among fewer family members (Gilligan et al., 2018).

Although declining fertility rates have put an emphasis on intergenerational relationships, especially parent-child relationships, they have also reduced *opportunities* for such exchanges because of fewer children, shrinking individuals' "kinship reservoir": a network of social relationships that can be activated in times of need (Hünteler & Hank, 2023). At the same time, rising life expectancy has amplified the *need* for strong parent-child bonds (and, in turn, a larger kinship reservoir). Adult children can, for example, offer support that reduces the need for formal care and alleviates pressure on health care systems (Agree & Glaser, 2009). Regular contact with adult children can further offer vital emotional support to older adults facing social isolation and loneliness (World Health Organization, 2021).

In recent decades, family scholars have raised concerns about a possible "decline of the modern nuclear family" in response to demographic shifts and evolving cultural norms, which may affect the ability to meet the needs of aging parents (Bengtson, 2001). However, it is not accurate to speak of a general decline of the nuclear family because the nature of these changes varies depending on the specific *dimensions* being measured. To measure different dimensions of parent-child relationships, researchers predominantly have drawn on Bengtson and Roberts's (1991) *framework of intergenerational solidarity*, which identifies six key dimensions of solidarity that characterize parent-child relationships:

- **Associational solidarity**: the intensity of intergenerational interaction, such as the frequency of face-to-face contact.
- **Affective solidarity**: positive emotions between parents and their children.
- **Consensual solidarity**: the similarity of norms and attitudes.
- **Functional solidarity**: help received and given.
- **Normative solidarity**: familialistic attitudes.
- **Structural solidarity**: opportunity structures for intergenerational solidarity, such as geographic proximity.

Instead of a general decline in parent-child relationships, researchers have highlighted a growing heterogeneity in parent-child relationships when differentiating these dimensions (Bengtson, 2001). In Germany, for example, where intergenerational relationships are relatively average in a European comparison (Hank, 2007), although geographic proximity (structural solidarity) between parents and adult children has decreased, emotional closeness (affectual solidarity) has remained stable (Mahne & Huxhold, 2017; Steinbach et al., 2020). In addition, while financial support from adult children has remained consistent, instrumental support has slightly decreased (functional solidarity; Steinbach et al., 2020). Thus, parent-child relationships remain important, but they should be examined from various dimensions to fully understand their impact.

Adapted from the intergenerational solidarity model, this dissertation therefore focuses on three dimensions of parent-child relationships that may directly affect older parents' mental and physical health in several critical ways, as discussed in detail in each study: *associational* (contact frequency), *functional* (instrumental help) and *structural* (geographic proximity) solidarity. These dimensions, which are frequently included in longitudinal aging studies, address key challenges faced by aging parents, such as loneliness due to a lack of frequent contact (associational) and the need for practical support (functional), as well as opportunity structures for parent-child interactions (structural).

1.3. Core assumptions and theories

1.3.1. Linking parent-child relationships to older adults' (mental) health

Family scholars stress that strong parent-child ties can significantly affect an individual's mental and physical health – "for better or for worse" (Thomas et al., 2017). However, why is it that parent-child relationships can affect parental mental and physical health? Studies of the positive impact of parent-child relationships on older adults' mental and physical health predominantly draw on *social causation* (Kröger et al., 2015) or *social support* mechanisms (Cohen & McKay, 1984) to explain health disparities. Both the social causation and social support frameworks propose that strong parent-child bonds – characterized, for instance, by close proximity, frequent contact, and support – can positively influence older adults' mental and physical health. This impact can occur through various channels, especially behavioral processes (e.g., health behaviors such as diet and exercise), and psychological processes (e.g., autonomy, emotions, and depression), which can all contribute to improved mental and physical health outcomes for older adults (Berkman et al., 2000; Dunér & Nordström, 2007; Fiori et al., 2006; Lawton et al., 1994; Lowenstein et al., 2007; Schafer & Sun, 2022; Uchino, 2006; van der Pers et al., 2015).

Whereas many scholars have highlighted the beneficial role of close parent-child ties (Carr & Utz, 2020; Fingerman et al., 2020), others have argued that relationships that become "too close" or involve "too much" support can lead to counterintuitive outcomes. According to the ideas of the *social breakdown* mechanism (Bengtson & Kuypers, 1985), such negative effects on parental mental and physical health may (unintentionally) result from a loss of autonomy and independence and increased emotional distress, often due to excessive support, excessive contact, or living too close together (coresidence; Caputo & Cagney, 2023; contact: Luo et al., 2022; support: Silverstein et al., 1996).

1.3.2. Reverse causality: (Mental) health as a determinant of parent-child relationships

Although it is important to illustrate how various aspects of parent-child relationships can either improve or detract from parents' mental and physical health, this dynamic is not unidirectional: Changes in a parent's mental and physical health can also influence the parent-child relationship. Most research indicates that older adults' deteriorating mental and physical health may trigger the support of their close ties, such as adult children. For example, adult children might offer more direct help, or move closer to their parents to facilitate ongoing care and assistance (Litwak & Longino, 1987; Schwarzer & Leppin, 1991). This phenomenon, known as the *mobilization* mechanism, reflects how deteriorating mental and physical health can prompt a reorganization of roles and responsibilities within intergenerational ties, with adult children stepping in to address their parents' needs.

Although it seems intuitive that older adults' declining mental and physical health would lead to increased support from family networks, some research indicates counterintuitive consequences. For example, as parents experience declining mental and/or physical health, they may instead withdraw from social interactions because of physical or psychological inability –

a phenomenon known as *health selection* (Kröger et al., 2015). This withdrawal can reduce the opportunities for adult children to provide help and support, creating a complex interplay in which declining mental and physical health can sometimes lead to less, rather than more, family support.

1.3.3. The role of parent-child disconnectedness

Although the relationship between parent-child relationships and the mental and physical health of older adults is complex and multifaceted, these dynamics become even more complex when parent-child relationships are *weakened.* Parent-child disconnectedness, similar to estrangement, refers to the lack of contact with at least one child, leading to decreased structural solidarity (Lin et al., 2024; Reczek et al., 2024). Against the background of the *framework of intergenerational resources*, such disconnectedness may exacerbate mental health issues in older adults by removing a crucial source of support and one of their closest ties in later life (Reczek et al., 2024).

According to *stress-process frameworks*, the mental health impact of parent-child disconnectedness depends on the specific context in which the disrupted contact occurs (Pearlin et al., 2005). Unpartnered parents (divorced, widowed, or never married) may have a greater need for support, so disconnectedness could result in a "double burden", stemming from the (potential) lack of support combined with disconnectedness. In contrast, disconnectedness may be more burdensome for parents in which disrupted ties are less common and socially stigmatized, such as in stable marriages (Pillemer, 2020). Furthermore, mothers may perceive disconnectedness as a greater burden, regardless of their marital status, because disconnectedness is more common among men (Arránz Becker & Hank, 2022; Reczek et al., 2023), and mothers typically report stronger parent-child relationships than fathers (Fingerman et al., 2020).

However, parent-child disconnectedness may not only be important in relation to *current* marital status but could also be equally, or even more, relevant during marital *transitions*, such as later life union dissolution. In older age, spouses and other romantic partners usually provide essential support, and their loss necessitates significant psychological adjustments, potentially leading to postdissolution mental health declines (Bennett & Soulsby, 2012). The increasing trend of separation among middle-aged and older adults, known as "silver splits" (Alderotti et al., 2022; Brown & Lin, 2022), adds to the relevance of this issue. These separations can be stressful, and conflict and distress often arise long before the actual dissolution (Amato, 2000; Lin & Brown, 2020). The *divorce-stress-adjustment perspective* highlights that whereas some individuals experience separation as an acute *crisis* that affects their mental health, others face *chronic strains* or prolonged adjustment periods (*convalescence;* Amato, 2000; Lin & Brown, 2020). Because adult children become crucial sources of support after separation in later life (Kahn & Antonucci, 1980), being disconnected from them can exacerbate mental health issues. Individuals with strong parent-child relationships (connected parents) may experience separation as a crisis, whereas those with weaker relationships (disconnected parents) might endure longer adjustment periods (convalescence) or face ongoing difficulties (chronic strain).

1.4. Summary of the four studies

In the following, I provide a comprehensive summary of the four studies that constitute this cumulative dissertation (see Table 1-1 for an overview of the four studies). Each study explores different facets of parent-child relationships and older adults' (mental) health, such as *instrumental help, geographic proximity* and *contact frequency,* using distinct longitudinal data sources, including the German Ageing Survey (DEAS, Chapter 2), the Health and Retirement Study (HRS, Chapter 3), and the Survey of Health, Ageing, and Retirement in Europe (SHARE, Chapters 4 + 5). By employing advanced longitudinal methods and exploring the absence of parent-child contact, these studies collectively enhance the understanding of parent-child relationships and older adults' (mental) health. After providing these summaries, I discuss the integrated insights that can be drawn from the four studies and suggest avenues for future research and policy implications on the basis of this project.

1.4.1. Study 1: The reciprocal relationship of self-rated health and instrumental help from adult children: Evidence from Germany

The first study (Chapter 2) aims to examine the interrelationship between self-rated health and instrumental help from adult children. Previous research on the support-health relationship has yielded mixed results, which I argue is only partly due to varying cultural contexts and different measures of support and health. More important, previous research has often overlooked two key methodological issues: *reverse causality* and *omitted-variable bias*. Recently developed dynamic panel models with fixed effects offer a solution to address both issues *simultaneously*.

To be specific, I explore four theoretically informed hypotheses that might drive the relationship between older adults' self-rated health and the instrumental help they receive from adult children. (1) The *social causation hypothesis* suggests that receiving instrumental help positively affects older adults' self-rated health. (2) Conversely, the *social breakdown hypothesis* posits that instrumental help can lead to negative self-rated health outcomes among older adults because of a loss of autonomy. (3) The *health selection hypothesis* argues that older adults may withdraw from social interactions (or, in this case, instrumental help) as their self-rated health declines. (4) In contrast, the *mobilization hypothesis* suggests that declining self-rated health activates instrumental help from older adults' networks.

I use longitudinal data from four waves (2008-2017) of the German Ageing Survey (DEAS) to explore these four hypotheses. The DEAS is a longitudinal study that examines the living conditions, health, and social relationships of adults aged 40 years and older in Germany. The German case is particularly interesting because of its relatively average levels of instrumental help and intergenerational relationships compared with those of other European

Table 1-1. Overview of dissertation studies

	Study 1	*Study 2*	*Study 3*	*Study 4*
Title	The reciprocal relationship of self-rated health and instrumental help from adult children: Evidence from Germany	Adult intergenerational proximity and parents' depressive symptoms: A bidirectional approach	Parent-child disconnectedness and older European adults' mental health: Do patterns differ by marital status and gender?	A research note on silver splits and parent-child disconnectedness: Mental health consequences for European older adults
Research Question(s)	What is the causal relationship between instrumental help from adult children and older adults' self-rated health over time?	Do changes in intergenerational proximity predict changes in older adults' depressive symptoms and vice versa?	(a) What is the prevalence of parent-child disconnectedness among older adults in Europe, and how does it vary by marital status and gender? (b) To what extent do marital status and gender moderate the association between parent-child disconnectedness and parents' depressive symptoms?	To what extent does parent-child disconnectedness moderate the effect of a silver split on depressive symptoms over time?
Dependent Variable(s)	(a) Self-rated health (b) Instrumental help	(a) Depressive symptoms (b) Geographic proximity	Depressive symptoms	Depressive symptoms
Independent Variable(s)	(a) Self-rated health (b) Instrumental help	(a) Depressive symptoms (b) Geographic proximity	Parent-child disconnectedness	Later life union dissolution ("Silver split")
Moderator(s)	-	(a) Gender (b) Race/Ethnicity	(a) Marital status (b) Gender	Parent-child disconnectedness
Data	German Ageing Survey, wave 2008-2017	Health and Retirement Study, wave 2004-2018	Survey of Health, Ageing and Retirement in Europe, wave 2004-2022	Survey of Health, Ageing and Retirement in Europe, wave 2004-2022
Statistical Method	Dynamic panel models with fixed effects	Dynamic panel models with fixed effects	Pooled ordinary least squares regression	Fixed effects panel regression
Author(s)	Sole authorship	With Valeria Bordone and Karsten Hank	With Deborah Carr	With Deborah Carr
Publication Status	Published in *The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences* (2023, 10.1093/geronb/gbad063)	Published in *Social Science Research* (2025, 10.1016/j.ssresearch.2024.103094)	Revised and resubmitted to *The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences*	Submitted to *Demography*

countries (Brandt et al., 2009; Hank, 2007). The final study sample comprises N=3,914 parents, each with at least one adult child.

The results from dynamic panel models with fixed effects reveal that instrumental help and self-rated health are not interrelated because neither predicts the other over time. Instead, both primarily showed autoregressive effects, meaning that their own previous levels predicted their own future levels. In light of these findings, I discuss that health-promoting interventions should start earlier in life, and policies should support strong relationships with adult children throughout the life course. More generally, I conclude that studies of the support-health nexus should apply more rigorous methodological approaches to ensure unbiased results.

1.4.2. Study 2: Adult intergenerational proximity and parents' depressive symptoms: A bidirectional approach

Building on the insights from the first study, the second study (Chapter 3) focuses on exploring the bidirectional relationship between intergenerational proximity and older adults' depressive symptoms. Together with Valeria Bordone and Karsten Hank, I contribute to the equivocal literature by applying a (more) rigorous methodological approach to a well-studied phenomenon – the proximity-health nexus. Whereas previous research has focused mainly on physical health, we consider depressive symptoms as another driver of relocation decisions. We further conduct separate analyses for coresidential transitions, because we acknowledge that coresidence does not equal close proximity.

In this study, we argue that parental mental health challenges may activate and relocate their support network (*mobilization mechanism*). At the same time, geographic convergence could affect older adults' mental health in two important ways: the *social support mechanism* suggests that close proximity reduces depressive symptoms through family support and interaction, whereas the *social breakdown mechanism* argues that it might decrease depressive symptoms due to stress, conflict, or loss of autonomy. Given that research indicates that geographic proximity and depressive symptoms in older adults can vary by parents' *gender* and *race/ethnicity* (Acciai & Hardy, 2017; Caputo & Cagney, 2023; Hank, 2007; Hooker et al., 2019), we further investigate which of the three mechanisms is more dominant within specific subgroups.

We use data from eight waves (2004-2018) of the Health and Retirement Study (HRS), a biennial household panel survey that tracks various aspects of the U.S. population aged 50 and over, including family support, mental health issues, and retirement transitions. The U.S. context is particularly interesting because, despite its individualistic culture (Silverstein et al., 2010), adult children continue to serve as primary caregivers because of weak public services (Wolff et al., 2016). Our analytical sample included N=17,671 respondents who had at least one adult child. By using dynamic panel models with fixed effects, our approach aims to rigorously assess and refine existing knowledge.

First, the study's findings reveal weak evidence for a "mobilization effect," whereby depression in parents – fathers in particular – appears to prompt increased proximity, including coresidence. Although the effect is statistically significant, its practical relevance is limited due to the very small coefficient. Second, we find stronger evidence of a "social breakdown" effect, whereby transitions to coresidence are associated with an increase in parents' depressive symptoms, especially among 'White' parents and fathers. We do not find evidence for a "social support" mechanism, because increased proximity does not lead to a decrease in parents' depressive symptoms. We interpret these findings in the context of coresidential transitions in the U.S., where such moves often result from challenges faced by adult children rather than parental health issues (Caputo & Cagney, 2023), which may in turn adversely affect parental mental health.

1.4.3. Study 3: Parent-child disconnectedness and older European adults' mental health: Do patterns differ by marital status and gender?

In the third study (Chapter 4), Deborah Carr and I move beyond examinations of strong parent-child relationships to investigate the mental health burden of weakened parent-child relationships, in particular parent-child disconnectedness. Although an increasing number of mothers and fathers are experiencing their later years outside the traditional “one marriage for life” model (Carr & Utz, 2020), to date, studies on parentchild disconnectedness have neglected to differentiate parents’ marital status or gender. Against this background, we focus on the prevalence and mental health burden of parent-child disconnectedness and how this relationship is moderated by marital status and gender.

On the basis of previous research, we assume that parent-child disconnectedness is more prevalent among parents with dissolved relationships and in particular among men. Building on *stress-process frameworks,* we further hypothesize that being disconnected from one or more children may be especially detrimental for unpartnered parents, because they may lack a strong support network during times of need. Conversely, parent-child disconnectedness could be particularly harmful for parents in a first marriage, because it is presumably relatively rare in this group and therefore more likely to carry social stigma. Furthermore, because mother-child relationships are usually stronger than father-child relationships, the consequences of parent-child disconnectedness may be more pronounced among women.

The data came from waves 1, 2, 4, 5, 6, 7, 8 and 9 of the Survey of Health, Ageing and Retirement in Europe (SHARE), ranging from 2004-2022. SHARE is a biennial longitudinal sister study to the HRS that employs a similar approach to investigate the health, social, and economic conditions of older adults across Europe and Israel. SHARE has a sufficiently large sample to examine parent-child disconnectedness among men and women across various marital statuses, including categories that are relatively rare in older individuals (such as those who are cohabiting, never married, and remarried) but that may represent particularly vulnerable groups. The final analytical sample comprised N=216,469 person-wave observations from N=82,687 parents.

Descriptive results show a low prevalence of disconnectedness among both men and women in first marriages, while divorced and never-married men exhibit a high prevalence.

Pooled ordinary least squares regression models indicate that disconnectedness is linked to increased depressive symptoms, with differences across marital status groups. We find the largest coefficients for men and especially women in stable marriages, where disconnectedness is uncommon. Additionally, disconnected widowed and divorced men and women and cohabiting men report higher depressive symptoms.

We discuss specific vulnerable groups that may require targeted interventions. Future research should aim to expand studies on childlessness and "kinlessness" to include parent-child disconnectedness as a potential predictor of social isolation and mental health burden.

1.4.4. Study 4: A research note on silver splits and parent-child disconnectedness: Mental health consequences for European older adults

In the fourth study (Chapter 5), Deborah Carr and I address parent-child disconnectedness during a particular critical life transition: a silver split. We specifically investigate the mental health *trajectories* associated with separation later in life, emphasizing how parent-child disconnectedness during these critical periods may affect the mental health of older adults. This study extends previous research by incorporating the European context and considering nonmarital separations, or silver splits. In addition, we employ a rigorous methodological approach – fixed-effects panel regression – to account for time-invariant confounding factors, such as childhood experiences or personality traits.

We apply the *divorce-stress adjustment framework* to explain potential differences between connected and disconnected silver splitters. Rather than viewing separation as a short-term *crisis*, we suggest that disconnected parents may experience a prolonged adjustment period (separation as *convalescence*) or may not adjust at all, viewing separation as a *chronic strain*.

We use longitudinal data from eight waves (2004-2022) of the Survey of Health, Ageing and Retirement in Europe (SHARE) to track the mental health trajectories of N=546 parents experiencing silver splits. SHARE's large sample size allows the quantitative study of silver splits and parent-child disconnectedness, which, although rare, can have a substantial societal impact. Our primary aim is to examine within-person changes in depressive symptoms among older parents before and after relationship dissolution and to explore how parent-child disconnectedness moderates these effects. We thus apply fixed-effects panel regression methods.

The results show that parents who stay connected and maintain contact with all their children during a silver split experience stable levels of depressive symptoms throughout the dissolution process. In contrast, disconnected parents show a significant increase in depressive symptoms in the year of dissolution, facing prolonged mental health impacts that persist for up to four years afterward. In light of these findings, we conclude that not all silver splitters experience the transition to separation as distressing. It is encouraging that parents who maintain contact with all their children demonstrate resilience throughout the silver split process, while only parents with strained parent-child relationships perceive the separation as a "double burden."

1.5. Conclusions

1.5.1. Summary of the key findings and contributions

In the context of aging populations, older adults' mental and physical health has become increasingly important. Parent-child relationships potentially play a key role in shaping health inequalities among older individuals. Against this background, this dissertation explores how parent-child relationships affect older adults' mental and physical health, focusing on three key dimensions of intergenerational solidarity: the provision of instrumental help, geographic proximity, and frequency of contact. I employ advanced methodological techniques to address two major issues in social science research: omitted-variable bias and reverse causality. In addition, I build on existing research by examining not only strong parent-child relationships but also the effects of weakened parent-child relationships, particularly for men and women with different marital statuses and the vulnerable group of "silver splitters".

Although each chapter of this dissertation provides a distinct contribution to the literature (as detailed in their respective Discussion sections), together they offer a more comprehensive understanding of the (inter)relationship between parent-child dynamics and older parents' mental and physical health. In the next section, I outline the broader contributions of my dissertation, which is structured around four key findings.

1) *Parent-child relationships and (mental) health are bidirectional concepts and should be studied using longitudinal methods:* Research on parent-child relationships and older adults' mental and physical health has yielded mixed results. I argue that these studies often fail to adequately address omitted-variable bias and the bidirectional nature of parent-child relationships and older adults' (mental) health, not taking advantage of the potential of available panel data and advanced longitudinal methods. This dissertation builds on previous research by addressing omitted-variable bias in Studies 1, 2, and 4 and takes an additional step in Studies 1 and 2 by tackling the issue of reverse causality. By employing a more rigorous methodological approach to longitudinal data, this work enhances the field's understanding of the topic.

Using dynamic panel models with fixed effects, Study 1 reveals that instrumental help and older parents' self-rated health are not interrelated. Instead, consistent with theories such as cumulative (dis)advantages (Dannefer, 2003) and the social convoy model (Kahn & Antonucci, 1980), earlier self-rated health and instrumental help are the key predictors of future outcomes. This finding not only challenges the assumption that strong intergenerational ties are beneficial to health but also calls into question the reliance on children for support in times of need. Study 2 further reveals that although proximity to children does not affect older parents' mental health, coresidence negatively affects mental health, supporting the social breakdown mechanism proposed by Silverstein and colleagues (1996). Moreover, similar to Study 1, Study 2 found no strong evidence that declining mental health prompts the activation of intergenerational support networks, challenging findings from previous research. Finally, Study 4, which employs fixed-effects regression models, reveals that parents who are disconnected from a child experience later life separation as a chronic strain, but parents who are connected with all of their children show relatively constant mental health outcomes during the silver split process. This challenges earlier theories of stressful life events, which suggest that a "crisis," such as divorce/separation, would consistently result in negative mental health effects (Amato, 2000). The findings of this study align with previous research that employed advanced longitudinal methods, revealing that relationships previously assumed to be causal are often not causal or may have been either underestimated or overestimated. Adopting a longitudinal and bidirectional approach will be indispensable for future research to gain a deeper understanding of these dynamics.

2) *More is not always "merrier":* Although Silverstein and colleagues identified, as early as 1996, that there can be "too much of a good thing" in parent-child relationships, research has largely concentrated on the positive outcomes of these relationships. Bengtson's 2001 warning to "be aware" of this issue has not significantly shifted the focus given that scholars still predominantly highlight the positive impacts of (strong) parent-child relationships on older adults' mental and physical health. This study, along with others (Bordone, 2015; Caputo, 2019; Luo et al., 2022), highlights that not all aspects of parent-child relationships have a positive effect on mental and physical health, challenging the social causation (Kröger et al., 2015) and social support (Cohen & McKay, 1984) mechanisms. To be specific, Study 2 emphasizes the risks associated with coresidential transitions in later life, which can negatively affect parental mental health. These findings are in line with the social breakdown mechanisms proposed by Bengtson and Kuypers (1985).

3) *Weakened parent-child relationships are relevant phenomena that can negatively affect mental health:* Although the positive consequences of strong parent-child relationships have been studied for decades, the prevalence of weakened ties and their potentially negative effects have largely been overlooked. Recently, however, research has begun to shift its attention toward this issue (Hank, 2024; Reczek et al., 2024). Against this background, a key contribution of this dissertation is its emphasis on weakened parent-child ties, with Studies 3 and 4

underscoring the prevalence and risks linked to these relationships. Study 3 reveals a particularly high prevalence of disconnectedness among men who were remarried, divorced or never married. Moreover, Study 3 demonstrates that mothers – and, to a lesser extent, fathers – in first marriages are particularly vulnerable to disrupted contact with their children, whereas parents in other marital status categories show less pronounced mental health associations. Although the mental health burden of parent-child disconnectedness may be more pronounced in contexts where disconnectedness is uncommon, it is important to acknowledge that the high prevalence of disconnectedness among men (in particular those who are remarried, divorced, or never married) may suggest a reduced "kinship reservoir" for these groups, potentially leading to increased social and health inequalities (Hünteler & Hank, 2023; Sauter et al., 2023). Study 4 further reveals that although strong parent-child bonds can help mitigate mental health challenges during later life union dissolutions, weak relationships can significantly exacerbate mental health issues in these distressing times. The findings underscore that weakened parent-child ties may be especially distressing during stressful life transitions and highlight the protective role of strong parent-child ties. The findings from both studies underscore the need to further explore weak parent-child relationships, which may be as important, if not more so, than strong relationships in influencing mental health outcomes.

4) *The (mental) health consequences of parent-child relationships depend on the measure of intergenerational relationships:* A strength of this dissertation is its broad focus on three aspects of the parent-child relationship. The multidimensionality of parent-child relationships has consistently emerged as a central theme throughout this work because each dimension has revealed distinct effects on parental mental and physical health. Consistent with previous research, the findings from all the studies together reaffirm that there is no "one-size-fits-all" solution (Bengtson, 2001). A crucial finding is the importance of distinguishing between different dimensions of parent-child relationships, as evidenced by the studies' varying results. For example, Study 1 revealed no relationship between instrumental help and older adults'

health, whereas Studies 2, 3 and 4 revealed that geographic proximity and lack of contact can contribute to a mental health burden. However, the dissertation further stresses the importance of making even finer distinctions. For example, as demonstrated in Study 2, although coresidence has a negative impact on parental mental health, close proximity does not, highlighting the need for researchers to carefully consider the measurement of specific concepts.

1.5.2. Limitations

Despite the contributions of this dissertation, several limitations must be acknowledged. *First* and foremost, like all longitudinal aging studies, this dissertation faces the challenge of *attrition*. As individuals age, they are more likely to drop out of the sample, especially those in poorer health or with less positive attitudes toward social relationships (Beller et al., 2022; Beller & Geyer, 2021). As a consequence, the results might underestimate the true relationship between parent-child relationships and older adults' mental and physical health.

Second, due to data limitations, all longitudinal studies in this dissertation examine how parent-child relationships and mental and physical health *unfold over a lag of three years* (DEAS) *or two years* (HRS and SHARE). This approach has two key consequences: a) short-term dynamics may be overlooked, and b) positive and negative effects could balance each other out over time (Umberson et al., 2010). To address these issues, future research should consider using survey data with shorter temporal lags. In addition, emerging methods that use monthly time scales could offer a more detailed understanding of the underlying dynamics, specifically when exploring parent-child relationships during life-course transitions (Sytkina, 2024).

Third, although this dissertation considered various contexts, it focused primarily on contemporary Western societies, including Germany, the United States, and continental Europe, leaving *less developed, low-income regions*, such as Latin America and Africa, underexplored. Recent research has begun to more rigorously examine parent-child relationships in these regions (Akinrolie et al., 2020; Quashie et al., 2022). Harmonized aging studies, such as the Mexican Health and Aging Study, the Costa Rican Longevity and Healthy Aging Study, the Brazilian Longitudinal Study of Aging, and the Chilean Social Protection Survey, present promising avenues for future research in the Latin American context. In Africa, however, the only harmonized aging survey currently available is the Health and Aging in Africa: A Longitudinal Study of an INDEPTH Community in South Africa, which is limited to a rural community in South Africa. To fully understand intergenerational dynamics in older people, especially in regions where these ties serve as crucial safety nets (Aboderin & Hoffman, 2015), more harmonized large-scale survey data from other less developed areas in Africa are needed.

Fourth, as Bengtson (2001) famously wrote in his seminal work, “the behaviors of one family member […] could not be understood except in relationship to other family members, their ongoing patterns of interactions, and personalities developing and changing through such interactions.” Although this approach is beyond the scope of this dissertation, the importance of *multigenerational relationships*, such as grandparenthood (Hank et al., 2018) or sibling relationships (Hank & Steinbach, 2018), should not be overlooked. Recent developments and new data sources, such as KINMATRIX, even allow the study of complete family networks of individuals, including ties to extended relatives such as cousins, aunts and uncles (Leopold et al., 2024) – a promising avenue for future research.

Finally, although the four studies address various aspects of parent-child relationships and older adults’ mental and physical health, many additional (inter)relationships remain unexplored. Future research should examine other dimensions of intergenerational solidarity, such as *affectual, consensual,* and *normative solidarity* (Bengtson & Roberts, 1991), which are often underrepresented in large longitudinal surveys of aging. Exploring these dimensions could provide a more comprehensive understanding of the heterogeneities within family dynamics (Bengtson, 2001) and their impact on older parents’ mental and physical health.

1.5.3. Implications and avenues for future research

The findings of this dissertation have significant implications for future research. *First*, and most importantly, they underscore the need to employ more rigorous methodologies, in particular those that take advantage of the *longitudinal* nature of datasets. Long-running panel data, such as those used in this dissertation and other prominent surveys, such as the German Socio-Economic Panel, the UK Household Longitudinal Study, and the Panel Study of Income Dynamics, have become the benchmark in social science research. This study advocates the application of robust longitudinal methods to obtain closer causal conclusions, because previous research that did not use these methods may have risked producing biased or spurious results (Leszczensky & Wolbring, 2019).

Second, although this study successfully disentangled some of the complexities in parent-child dynamics using mainly advanced longitudinal methods, the findings from this dissertation also demonstrate that quantitative methods have limitations that restrict our ability to fully address all aspects of parent-child relationships and older adults' (mental) health. *Qualitative research*, on the other hand, offers a promising approach for exploring complexities and subtle nuances in greater depth. Issues such as having a weak parent-child relationship are particularly sensitive, and qualitative methods may provide the sensitivity and support needed for participants to share their experiences openly. Qualitative research could, for example, further explore the underlying reasons for disconnectedness (Agllias, 2018) and investigate why, in some instances, it results in a mental health burden, whereas in other cases it might even be perceived as a relief. Furthermore, qualitative research has the potential to unravel the reasons behind geographic relocations, in particular coresidential transitions, to better understand why these moves can be detrimental to parents' well-being, as shown in Study 2.

Finally, Studies 3 and 4 revealed that weak parent-child ties are relevant phenomena and can be particularly burdensome for many older parents, especially during critical life transitions and in contexts where disconnectedness is rare. Whereas much research has focused on childlessness and "kinlessness" as factors of social isolation (Deindl & Brandt, 2017; Mair, 2019; Teerawichitchainan et al., 2024), more studies are needed that focus on *(alternative) support networks* in the context of parent-child disconnectedness, because simply having children does not automatically guarantee being in contact and potentially receiving support from them during distressing times. The need for further research is particularly pressing given the context of low fertility rates, high divorce rates and increasing life expectancy (Lesthaeghe, 2014), because older parents who are disconnected from one or more children may have limited sources of alternative support, especially those whose marriages have ended.

1.5.4. Policy implications

Understanding the (inter)relationship between parent-child relationships and older adults' mental and physical health not only provides guidance for future research but also has three important policy implications. *First*, Studies 1 and 2 underscore the significant impact of early mental and physical health and parent-child relationships on later life outcomes. As a consequence, future policies should prioritize interventions that promote optimal health and strong parent-child bonds from *early stages in the life course* rather than simply focusing on restoring health or relationships later in life. This approach aligns with theories of cumulative disadvantage (Dannefer, 2003), suggesting that early-life interventions can prevent negative outcomes in older individuals. In addition, policies should avoid merely encouraging adult children to support their aging parents or rebuild (potentially harming) connections; instead, they should emphasize fostering strong parent-child relationships throughout the life course to ensure lasting bonds (Kahn & Antonucci, 1980), for example, by offering counseling services to (struggling) families that teach effective communication strategies and provide support with conflict resolution.

Second, Study 2 suggests that coresidence may negatively affect older adults' mental health, indicating that there can be "too much of a good thing." Although the exact reasons for this negative impact remain unclear (highlighting a potential avenue for qualitative research), policy interventions could be tailored to address the underlying motivations for coresidence. If the move is intended to support aging parents, policies should focus on creating environments that *preserve their autonomy* while offering necessary assistance. Conversely, if the move is intended to support struggling adult children, which is predominantly the case (Caputo & Cagney, 2023), interventions should prioritize *helping them outside of the parental home*. These interventions could offer affordable housing options, or rental subsidies, to help struggling adult children gain independence outside of the parental home. This seems especially important given the ongoing debate on affordable housing in the U.S. context (Schaeffer, 2022). In addition, workforce development initiatives aimed at enhancing job skills, along with financial literacy programs, could provide further support for adult children, because research indicates that unemployed returning adult children can be particularly detrimental to older adults' mental health (Caputo & Cagney, 2023).

Third, the findings overall suggest that policymakers should avoid encouraging the re-establishment of stressful relationships with disconnected children or strengthening distressing relationships with children who are "too" involved in the lives of older adults (for instance through cohabitation). Strengthening already-strained relationships may exacerbate existing conflict or emotional distress, potentially leading to further deterioration in the well-being of both parties, whereas overly dependent parent-child relationships may lead to further increased independence. Effective policy interventions should prioritize fostering *protective family-based support* while also promoting alternative *support networks beyond the family* (Mair, 2019), that respect older adults' autonomy and can provide support during critical life transitions.

1.6. Status of the studies and contribution of coauthors

In the first study, titled "The reciprocal relationship of self-rated health and instrumental help from adult children: Evidence from Germany," published in *The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences* (2023, 10.1093/geronb/gbad063), I independently carried out all aspects of the research. Throughout the process, I benefited from the feedback and support provided by both my advisors and several colleagues.

The second study, titled “Adult intergenerational proximity and parents’ depressive symptoms: A bidirectional approach,” was recently published in *Social Science Research* (2025, 10.1016/j.ssresearch.2024.103094). As the lead author, I developed the research question, prepared the data, conducted the empirical analyses, and wrote the methods, results, and initial drafts of the introduction and background sections. Valeria Bordone of the University of Vienna provided comprehensive editing and helped with the conceptualization of the study. Karsten Hank of the University of Cologne edited the introduction and background, wrote the discussion, and helped with the study’s conceptualization.

The third study, titled “Parent-child disconnectedness and older European adults’ mental health: Do patterns differ by marital status and gender?” was recently revised and resubmitted to *The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences.* As the lead author, I codeveloped the research question, prepared and analyzed the data, wrote the methods and results sections, and edited the remaining parts of the manuscript. My coauthor, Deborah Carr of Boston University, codeveloped the research question, wrote the background and discussion sections, and edited the parts she did not write.

The fourth study, titled “A research note on silver splits and parent-child disconnectedness: Mental health consequences for European older adults,” was recently submitted to *Demography*. As the lead author, I developed the research question, prepared and analyzed the data, and wrote the first draft of the manuscript. My coauthor, Deborah Carr of Boston University, provided comprehensive editing of the manuscript and assisted with the study’s conceptualization.

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Chapter 2

The reciprocal relationship of self-rated health and instrumental help from adult children: Evidence from Germany

Lisa Jessee

Abstract

Objectives. Receiving support from adult children may promote or be harmful for older adults' health. Poor health, however, often precedes the need for intergenerational support. To date, few studies have addressed the relationship between instrumental help (i.e., help with household chores) and older adults' self-rated health (SRH) simultaneously, thereby accounting for potential reverse causality. Moreover, little research has accounted for omitted variable bias.

Methods. Dynamic panel models with fixed effects provide an opportunity to address these methodological issues. Drawing on four waves of the German Ageing Survey (DEAS), which provide a sample of 3,914 parents aged 40 - 95 years, I investigate the bidirectional linkages between instrumental help from adult children and SRH.

Results. Results suggest that prior receipt of instrumental help is not a significant predictor of future reported SRH. Similarly, previous SRH does not significantly predict the likelihood of receiving instrumental help at follow-up. Instead, earlier values of SRH and instrumental help are most important for predicting future SRH and instrumental help.

Discussion. The results shed new light on the interplay between SRH and instrumental help from adult children. The study suggests, that older adults' health and support in later life are not interdependent. I discuss these findings in relation to future policies for healthy aging to focus on interventions that facilitate optimal health in the earlier stages of the life course and for adult children to provide continued support to their parents.

2.1. Introduction

As individuals age, they are both more likely to suffer from health limitations, which can potentially increase their dependence on social support, and more likely to receive social support, especially from *adult children* (Agree & Glaser, 2009). Social support from adult children, especially at higher levels, can increase distress in terms of loss of autonomy and control and can thus be harmful to older adults' health (Silverstein et al., 1996). However, social support may also decrease stress, by affecting psychological and physiological pathways (Berkman et al., 2000). Against the background of population aging, both issues – health and social support in later life – gain in importance, but their *interrelationship* across individuals' life course is still poorly understood.

Previous research on the health-support nexus provides mixed findings: Whereas some research points to a beneficial role of social support from children on life satisfaction (Chen & Jordan, 2018), other research suggests social support from adult children is associated with higher levels of depression (Djundeva et al., 2015), lower life satisfaction (Lowenstein et al., 2007), and lower wellbeing (Thomas, 2010). So far, little research has addressed the implications of health on the provision of social support from adult children (Ha et al., 2017); however, most studies suggest poor health increases the likelihood of receiving social support provided by adult children (Cunningham et al., 2022; Huo et al., 2018). Whereas some of this ambiguity may be explained by the use of different indicators of health and social support in the research, a main methodological shortcoming in previous studies, which has seriously limited the extent to which reliable substantive conclusions can be drawn, is the neglect of the issues of *reverse causality* and *omitted variable bias*. Hence, researchers cannot be sure if social support causes health, or vice versa (i.e., reverse causality). Moreover, results may be biased, when we omit independent variables from the model, that have a significant effect on our dependent variable (i.e., omitted variable bias). Recently, many researchers have begun to pay attention to these issues (e.g., Das, 2021; Mao et al., 2020).

The present study aims to overcome these methodological limitations by estimating dynamic panel models with fixed effects (ML-SEM) based on four waves of the *German Ageing Survey* (DEAS) among 3,914 adults aged 40 years and older. The main objective of this study is to *disentangle* the interrelationship between health and social support in Germany over time. Health will be assessed by *self-rated health* (SRH) and social support by receiving *instrumental help* from adult children. Although it has been argued that SRH measures the perception of health rather than the overall health status (Layes et al., 2012), it is still considered a suitable measure for the overall health status of older adults, as it can be explained by various mental and physical health information (Lazarevič & Brandt, 2020) and can even predict mortality (Jylhä, 2009). However, the influence of mental and physical health information on SRH changes across the lifespan: middle aged adults use a wide range of health information to assess their health, whereas older adults are more influenced by psychological factors (Spuling et al., 2015). Instrumental help (i.e., help with household chores) represents a great amount of social support in older age and has been linked with healthy ageing. The distinction between instrumental help and personal care is crucial when investigating health in later life since help is usually provided sporadically, whereas care is provided more regularly and follows particular support needs (Brandt et al., 2009). Looking at the German example seems advantageous because of its relatively average intensity of intergenerational relationships (Hank, 2007) and instrumental help within Europe (Brandt et al., 2009). Moreover, supplementing findings from the Asian and U.S. American contexts with evidence from Germany seems highly desirable, as public health care in Germany (e.g., expenditure on long-term care) is more advanced (Colombo et al., 2011), and intergenerational solidarity in European countries is not as strong as it is, for example, in Asian countries (Djundeva et al., 2019). In the following, I review theoretical and empirical considerations on the health-support nexus. I then present the current research, which simultaneously investigates the bidirectional linkages between instrumental help from adult children and SRH in later life.

2.2. Effects of instrumental help on health

Differences in health among older adults are often explained using the *social causation* hypothesis (Kröger et al., 2015). Against this background, instrumental help may have a positive impact on health through at least two pathways: First, instrumental help can affect *behavioral* processes. Behavioral processes may include health behaviors, such as eating habits or exercise. Second, instrumental help can affect *psychological* processes, such as older adults' autonomy, emotions or depression (Berkman et al., 2000; Uchino, 2006). In addition, research has shown that the effects of behavioral and psychological processes on health outcomes are mediated through *physiological* pathways, such as effects on the cardiovascular, endocrine, and immune systems (Uchino, 2006; Uchino et al., 1996). Instrumental help may also be associated with other exchanges of support (e.g., emotional support), that can provide further positive experiences for aging parents (Lowenstein et al., 2007), and buffer negative effects of stress (Cohen & McKay, 1984). This could apply to the European context in particular, where instrumental help is given mostly sporadically and has less of an obligatory character than personal care (Brandt et al., 2009). However, in Europe, the sporadic provision of instrumental help may also have only little or no effect on older adults' health. Yet, instrumental help could also predict declining health, due to the loss of self-esteem (Fisher et al., 1982), autonomy, and increasing dependency (Silverstein et al., 1996). An explanation for the latter is that classifying older adults as incapable and dependent potentially causes them to unlearn existing skills and internalize this dependency. This mechanism is referred to as *social breakdown* (Bengtson & Kuypers, 1985).

2.3. Effects of health on instrumental help

An explanation for the linkage between older adults' health and instrumental help from adult children is the *health selection* mechanism (Kröger et al., 2015). A declining health status could predict less instrumental help because of individual's inability to participate in social activities.

Consequently, individuals may have fewer social contacts and therefore less help (Almquist et al., 2017). However, one may assume older adults withdraw solely from less helpful ties, thereby strengthening important support ties (Carstensen, 1992). Moreover, experiencing decreasing health could also predict more instrumental help because individuals need additional support resources. Adult children are assumed to respond to their parent's health needs by providing instrumental help. Partly, this may be because adult children occupy an important role in older adults' support networks (Agree & Glaser, 2009). Thus, they are expected to provide support in response to specific support needs of their aging parents (Kahn & Antonucci, 1980). This mechanism is called *mobilization* (Schwarzer & Leppin, 1991). In Europe, although poorer perceived health is more likely to influence caregiving, a relationship, albeit somewhat weaker, is also found with instrumental help (Brandt et al., 2009).

2.4. Health from a life course perspective

The deterioration of health in one's earlier life course has major implications for subsequent health trajectories (cf. Haas, 2008). In later life, the influence of biological factors on health is more pronounced than the influence of social factors on health (Hoffmann, 2011). Moreover, in later life, individuals' health profiles have already been exposed to several (dis)advantages (Dannefer, 2003). Thus, the effects of health inequality may accumulate over time. Eventually, this can influence the effectiveness of social support (i.e., instrumental help from adult children). Hence, from the perspective of *cumulative (dis)advantages*, instrumental help may not affect health in later life, as social factors may not overcome inequalities that have been developing over the individuals' life course. Instead, current levels of SRH may strongly be determined by previous levels of SRH (Jylhä, 2009; Perruccio et al., 2010), that is even if the previous evaluation differs from the current evaluation (Bollen & Gutin, 2021). Even more, SRH may be the *strongest* predictor of SRH in the future, even when accounting for other health measures and social support (Bailis et al., 2003).

2.5. Instrumental help from a life course perspective

At the same time, close family ties, which normally include children, tend to remain relatively stable over the life course. Following Kahn & Antonucci (1980, p. 256) “with regard to social support […], the past affects the future.” Adult children represent an important part of social support in later life (Agree & Glaser, 2009). Hence, in later life, intergenerational relationships remain quite stable in most dimensions (Brandt et al., 2009; Hank, 2007). Moreover, parent-child relationships are quite resistant to external changes (Kahn & Antonucci, 1980). Against the background of the *social convoy model*, changes in older adults’ health may therefore neither “mobilize” nor “withdraw” instrumental help from adult children. Instead, instrumental help may be provided regardless of older adults’ health status; that is, even when there is no underlying health need and help has been provided beforehand. Hence, current levels of instrumental support may not evolve spontaneously, but are partly dependent on past levels and earlier experiences of instrumental help (Kahn & Antonucci, 1980).

2.6. Empirical evidence

So far, little research has focused on the interrelationship between instrumental support from adult children and older adults’ SRH. Yet, research suggests the receipt of instrumental support from adult children is associated with poor SRH (Song et al., 2008; Zunzunegui et al., 2001). Conversely, no longitudinal effect was found between SRH and instrumental support from adult children (Kohli et al., 2009). Moreover, existing research that explicitly analyzed *bidirectional effects* of diverse health and social support dimensions yielded mixed results. To date, only two longitudinal studies have examined social support from adult children with respect to SRH. Using two waves of data from the Health and Retirement Study (HRS), Ha and colleagues (2017) applied cross-lagged panel models. The authors found no longitudinal association between any social support measures and health. On the other hand, they did find a longitudinal association between adults’ poor health and negative interactions with their children (health selection). However, this study did not include measures on instrumental *help*. In the only – to the best of my knowledge – study on instrumental help and SRH, Mao and colleagues (2020) used five waves of data from the study "The Wellbeing of Older People in Anhui Province," a study of community-dwelling adults aged 60 years or older, living in the Anhui Province, China. Applying a bivariate latent change score model, the authors found the receipt of instrumental help from adult children predicted older adults' SRH. Specifically, older adults receiving instrumental help from adult children reported a better SRH in the following wave (social causation). However, inversely, SRH could not predict instrumental help received from adult children. Although these studies found different effects of SRH on social support and vice versa, both conclude that prior values of SRH predict future outcomes of SRH. Moreover, both studies suggest prior receipt of social support predicts the receipt of social support in the follow-up (Ha et al., 2017; Mao et al., 2020).

2.7. Methods

2.7.1. Data

Analyses were carried out based on four waves of longitudinal survey data from the German Ageing Survey (DEAS) (Klaus et al., 2017), a study of community-dwelling individuals aged 40 years or older. For this study, I drew on the interviews from 2008 as a baseline and followed the respondents for up to three follow-up waves (2011, 2014, 2017). Unfortunately, this study could not consider data from 1996 and 2002 because of the six-year time lag between waves. The most recent data from 2020 were not included because during the COVID-19 pandemic the survey method was changed from CAPI to CATI. Moreover, the new subsample drawn in 2014 was not considered.

The initial dataset included n=9,101 respondents. However, the sample for the current analysis is restricted in four ways: First, I only considered respondents with adult children (i.e., children who have reached the legal age of 18), as younger children are not able to perform many help activities on their own. Thus, I excluded n=1,006 respondents from the initial sample. Second, I excluded n=3,527 respondents who participated in fewer than two (consecutive) waves over the 9-year period. Finally, I restricted the sample by excluding respondents with no or only one response on our main dependent variables (n=72) and respondents with no information on the covariates (n=582). This left me with an overall analytic sample of 3,914 individuals[i]. The average number of observations was 3.2. At baseline, the average respondent was 63.6 years old, and 50.4% of the respondents were female.

2.7.2. Measurements

2.7.2.1. Instrumental help

To measure instrumental help, respondents were asked to report if they received help with household work (e.g., cleaning, small repair jobs, or shopping) from anyone not living in their household. Respondents receiving instrumental help had to indicate who provided the help. I only included respondents who received help from their adult *children*. For the analysis, instrumental help was a dichotomous variable, contrasting respondents who received instrumental help from adult children (=1) with respondents who did not receive instrumental help from their adult children (=0)[ii].

2.7.2.2. Self-rated health

Similar to Mao and colleagues (2020), the current study focuses on SRH. A single-item question ("How would you rate your current state of health?") was asked, with higher values indicating better health (1=very bad, 2=bad, 3=average, 4=good, 5=very good). DEAS also provides other physical and mental health measures, but unfortunately, some of them have a high item non-response. Nevertheless, I cross-validated the results with various health indicators (see Supplementary Tables A2-1 + A2-2).

2.7.2.3. Covariates

I included several time-varying covariates in the model to capture characteristics that are likely to influence both instrumental help from adult children and SRH. These included (a) several *demographics,* such as age, partner status, coresidence with children, employment status and relative poverty; (b) *health* variables, such as depressive symptoms and physical impairment; and (c) aspects of *intergenerational relationships*, such as perceived emotional support from children and contact to children. For an overview of all variables in the analysis see Table 2-1[iii].

2.7.3. Statistical analyses – dynamic panel model with fixed effects

When working with panel data, omitted variable bias poses a major problem. Ordinary least square models applying a fixed effects estimator deal with omitted variable bias by subtracting the individual mean from the observed values of all variables (Vaisey & Miles, 2017). However, when examining instrumental help and SRH, there are two major limitations with fixed effects models: First, researchers cannot control for the autoregressive (i.e., lagged) status of the dependent variable. However, as elaborated earlier, prior values of SRH and instrumental help may strongly determine subsequent levels of SRH and instrumental help. More specifically, a recent study explicitly suggests to model SRH, combining both autoregressive effects and time-invariant confounders as otherwise results may be biased (Bollen & Gutin, 2021). Second, fixed effect models are based on strict assumptions of exogeneity. Thus, if reverse causality is present, the results of the fixed effect model may be distorted (Brüderl & Ludwig, 2014).

To date, methods that address reverse causality (e.g., cross-lagged panel model) neglect to account for omitted variable bias. Recently developed *dynamic panel models with fixed effects* in the SEM context (ML-SEM) provide an opportunity to address these methodological issues (Allison et al., 2017). By applying ML-SEM, I account for omitted variable bias, whilst simultaneously modeling the linkages of instrumental help and SRH.

Table 2-1. Measurement details for all variables

Variable	Description	Categories
Self-rated health	Self-reported health status	1=Very bad 2=Bad 3=Average 4=Good 5=Very good
Instrumental help	Instrumental help from adult children	1=Instrumental help 0=No instrumental help
Age	Respondents' age	1=40-54 years 2=55-64 years 3=65-74 years 4=75-84 years 5=85+ years[a]
Partner status	Respondents' partner status	1=Partner or spouse 0=No partner or spouse
Coresidence	Coresidence with closest living child	1=Coresiding with child 0=Not coresiding with child
Employment status	Respondents' employment status	1=Working 0=Not working
Relative poverty	Relative poverty based on total household income, adjusted for household size	1=Living in relative poverty 0=Not living in relative poverty (=0)
Depressive symptoms	CES-D scale	Depressive symptoms (0-45)
Physical impairment	List of several diseases	Number of physical impairments (0-11)
Contact to child	Respondents' contact frequency to child	1=Less than several times a year 2=Several times a year 3=1 to 3 times a month 4=Once a week 5=Several times a week 6=Daily
Emotional support	Perceived emotional support from children	1=Emotional support 0=No emotional support

Note. CES-D = Center for Epidemiologic Studies Depression Scale.
[a] Including age as a continuous variable led to convergence problems.

Time-invariant confounders are accounted for, by including *unit specific factors* as a latent construct. Moreover, the ML-SEM framework allows me to include the autoregressive effect of the dependent variables. Therefore, ML-SEM can be considered a "special case" (Allison et al., 2017, p. 3) of the cross-lagged panel model and is sometimes referred to as cross-lagged panel model with fixed effects. Put simply, the ML-SEM estimates the relationship between time-varying exogenous variable(s) and an endogenous outcome while accounting for time-invariant individual traits, using within-respondent variation (for a detailed description, see Supplementary Material A2-1).

A recent study suggests fixed effects models may be biased when temporal lags are misspecified, leading to reverse estimations (Vaisey & Miles, 2017). However, in a simulation study ML-SEM provided correct estimations when both cross-lagged and contemporaneous effects were specified (Leszczensky & Wolbring, 2019). Thus, I additionally account for the contemporaneous effect of SRH on instrumental help and vice versa. To permit comparison across models, I additionally set error variances to be equal across waves, meaning that the model did not control for *time-varying* error variance. Rerunning the model without constraints, did not change the results (see Supplementary Table A2-3). The equations are specified as follows:

(1) $y_{it} = \alpha_t^{(y)} + \beta_{y1}^{(y)} y_{it-1} + \beta_{x1}^{(y)} x_{it-1} + \beta_{x1}^{(y)} x_{it} + u_{it}^{(y)} + \eta_i^{(y)}$

(2) $x_{it} = \alpha_t^{(x)} + \beta_{x1}^{(x)} x_{it-1} + \beta_{y1}^{(x)} y_{it-1} + \beta_{y1}^{(x)} y_{it} + u_{it}^{(x)} + \eta_i^{(x)}$

By default, ML-SEM applies the maximum likelihood (ML) estimator, which assumes a normal distribution in the outcomes and is best fitted to continuous dependent variables. However, even when the normality assumption is violated, the ML estimator is consistent (c.f., Moral-Benito et al., 2018). The WLSMV[iv] estimator is recommended for analyses with ordered categorical or binary variables (Li, 2016). However, WLSMV uses listwise deletion. Thus, a substantial number of people drop out of the sample. Since the full-information maximum likelihood estimator (FIML) can be employed, I decided to retain with the ML estimator. Nevertheless, I conducted robustness analyses using the WLSMV estimator in Mplus. Overall, the robustness analyses confirm the trends of the ML estimator (see Supplementary Table A2-4).

Logistic regression revealed that, across waves, the likelihood of dropping out of the survey was higher for older, less-educated men, who reported a poor SRH. Receiving instrumental help from adult children was not associated with attrition. To deal with attrition and missing values across waves, I used FIML. FIML is recommended to handle attrition and missing values when using ML-SEM (Allison et al., 2017).

To test the goodness-of-fit, I mainly draw on the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Tucker-Lewis Index (TLI) Following Hu and Bentler (1999), an RMSEA smaller than 0.06 and a CFI and TLI larger than 0.95 suggest a good model fit. Replication files are available here.

2.8. Results

2.8.1. Descriptive results

Across waves, I did not observe any multicollinearity issues. Moreover, there is sufficient within-variation to justify a fixed effects approach (see Supplementary Table A2-5). As shown in Table 2-2, at the personal baseline, 8.2% of respondents reported receiving instrumental help from their adult children. At final assessment, the amount of instrumental help received increased to 12.6%. However, SRH remained quite stable across waves.

Table 2-2. Descriptive sample statistics (unweighted)

Variables	Baseline	+1	+2	+3
N	3,495	3,454	3,174	2,541
Instrumental help (Yes/No)				
%	8.2	11.6	12.6	12.6
Self-rated health (1-5)				
Mean (SD)	3.6 (0.8)	3.5 (0.8)	3.5 (0.8)	3.5 (0.8)

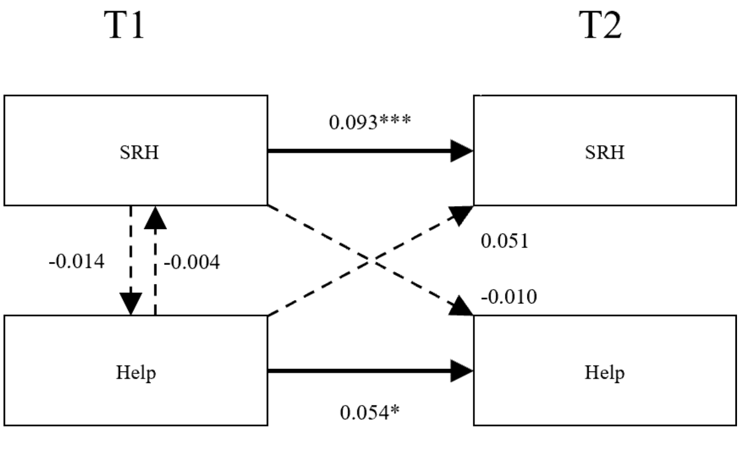
Note. SD = standard deviation.

2.8.2. Results from dynamic panel model with fixed effects

The unstandardized ML-SEM fixed effect coefficients of SRH on instrumental help from adult children – and vice versa – appear in Figure 2-1. By default, ML-SEM constrains coefficients to be the same across waves. However, even when relaxing this constraint, coefficients across waves remain the same (see Supplementary Table A2-6). As shown in Table 2-3, the goodness-of-fit indices suggest an excellent model fit for both models (Model 1: RMSEA = 0.009, CFI = 0.986, TLI = 0.973; Model 2: RMSEA = 0.008, CFI = 0.997, TLI = 0.995). Moreover, although chi-square is sensitive to large sample sizes, I found non-significant values in both models (Model 1: $\chi 2$ (df) = 68.013(53); Model 2: $\chi 2$ (df) = 66.414(53)), indicating a satisfying model fit.

Looking first at Model 1 of Table 2-3, the cross-lagged effect of SRH on instrumental help is non-significant. That means the prior receipt of instrumental help from adult children is not a significant predictor of future reported SRH. However, instrumental help has a strong lagged effect on itself across waves. Thus, independent of older adults' SRH, prior receipt of instrumental help is a statistically significant predictor of receiving instrumental help at follow-up.

Figure 2-1. Unstandardized coefficients of bidirectional relations between self-rated health (SRH) and instrumental help (Help)



Note. FIML estimator applied, covariates include age, partner, coresidence, employment status, poverty status, CES-D, physical impairment, contact to child and emotional support. Significant paths: solid lines in black. Insignificant paths: dashed lines; N=3,914.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Continuing with SRH as an outcome variable (Model 2 of Table 2-3), I estimated whether instrumental help from adult children predicts the future outcome of SRH. The cross-lagged effect of instrumental help on SRH is non-significant, meaning previous SRH does not significantly predict the likelihood of receiving instrumental help from adult children at follow-up. However, SRH, just like instrumental help, has a strong autoregressive effect on itself at a later time point. That is, past SRH predicts future SRH, regardless of adult children's instrumental help.

Several robustness analyses were conducted; however, in general, the main results were confirmed and the choice of estimator was supported (for a detailed description see the Supplementary Material A2-2).

2.9. Discussion

Starting out from previous literature that suffers from major methodological shortcomings, the present study set out to investigate the reciprocal relationship between instrumental help from adult children and older adults' SRH. Using four waves of data from the German Ageing Survey, I estimated ML-SEM to address recent methodological issues on reverse causality and omitted variable bias.

The primary finding of this study is the lack of evidence for bidirectional linkages between instrumental help from adult children and older adults' SRH. Hence, consistent with previous studies using advanced fixed-effects methods, this study finds that results considered causal in several previous studies are, in fact, *not* causal. More specifically, the results contrast with several prior studies suggesting a cross-sectional (Song et al., 2008; Zunzunegui et al., 2001) or longitudinal linkage between instrumental help and SRH (Mao et al., 2020). Although Mao and colleagues (2020) investigate similar concepts, the different findings are not surprising, considering that they have not accounted for unobserved confounding. More importantly, their study focusses on a *rural Chinese* population, which compared to Germany, not only differs in

Table 2-3. ML-SEM of self-rated health and instrumental help

	Model 1	Model 2
	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.054*	-
	(0.021)	-
Self-rated health	-	0.093***
	-	(0.018)
Cross-lagged effect		
Instrumental help	-	0.051
	-	(0.042)
Self-rated health	-0.010	-
	(0.010)	-
Contemporaneous effect		
Instrumental help	-	-0.004
	-	(0.053)
Self-rated health	-0.014	-
	(0.014)	-
Time-varying control		
Age	0.021**	0.021
	(0.007)	(0.015)
Partner	-0.006	0.003
	(0.025)	(0.047)
Coresidence	-0.044*	0.002
	(0.018)	(0.034)
Employment	0.008	0.024
	(0.019)	(0.035)
Relative poverty	0.005	0.029
	(0.022)	(0.042)
Depressive symptoms (CES-D)	0.002*	-0.031***
	(0.001)	(0.002)
Physical impairment	-0.005	-0.026**
	(0.004)	(0.008)
Contact to children	0.016**	-0.009
	(0.006)	(0.011)
Emotional support	0.044***	0.020
	(0.010)	(0.019)
Goodness-of-fit		
$\chi 2$ (df)	68.013(53)	66.414(53)
RMSEA	0.009	0.008
CFI	0.986	0.997
TLI	0.973	0.995

Note. Unstandardized coefficients, SE = standard error, $\chi 2$ = Chi-square value, df = degrees of freedom, CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* p < .05; ** p < .01; *** p < .001.

health care service availability (Colombo et al., 2011) but also in the extent to which children are expected to help their aging parents in times of need (Djundeva et al., 2019). The findings, however, align with Ha and colleagues (2017), who also did not observe a longitudinal association between received social support and older adults' SRH in the U.S. Conversely, the lack of a longitudinal linkage between older adults' SRH and instrumental help aligns with other longitudinal studies among samples of older adults in Europe and China (Kohli et al., 2009; Mao et al., 2020). In fact, only Ha and colleagues (2017) found a longitudinal association from SRH on social support. Secondly, and importantly, although the autoregressive results partly align with other studies (Ha et al., 2017; Mao et al., 2020), this study is the first to suggest that the autoregressive effects *exceed* the bidirectional associations between health and social support. Hence, the findings of the present study suggest that, rather than being interdependent, earlier assessment of instrumental help and SRH are most important for predicting instrumental help and SRH in later life.

Although this study addresses a highly specific country context and measures of social support, the results cast doubt about the interplay of health and social support more generally. If we still assume an interplay between health and support, future research must apply advanced methods to a broader context. For example, future studies should look at other domains of family support, such as personal care, as it is more time-consuming than instrumental help and reflective of individuals' health needs (Brandt et al., 2009). Moreover, as this study focused on instrumental help from non-resident children, future studies may include co-resident children, as help is provided more regularly given closer proximity (De Koker, 2009). Robustness checks with adults aged 65 and older question whether the need for assistance in old age occurs more quickly when other factors are at play, since there is no autoregressive effect of instrumental help for this sample. Conversely, the insignificant autoregressive effect of SRH among individuals under 65 years suggests that health problems occur more rapidly among this population. Further, although this study cross-validated the results with several other health outcomes, future research may focus on other aspects of older adults' health and emotional wellbeing. In addition, results may differ across countries; for example, in Germany, intergenerational solidarity is not as strong as it is in Asian countries (Djundeva et al., 2019). Finally, the current study focused on parent-child relations but the interplay between support and health involves more complex social relationships. Hence, future research may focus on support provided by other family members, for example, individuals' partner, or their adult grandchildren.

However, if future research shows there is indeed *no* (strong) bidirectional interplay between health and support in later life, as social factors may not overcome health inequalities that have been developing over the life course, and changes in health may neither strengthen nor loosen lifelong relationships that are parent-child relationships, research and social policy will need to focus more on interventions to facilitate optimal health in earlier stages of the life course and ways for adult children to provide continued support their parents. The findings of the present study suggest that by the later years of life, individuals' health profiles have already been exposed to several (dis)advantages, which may accumulate over time (Dannefer, 2003). Thus, the interplay between health and social support, if any, is more evident earlier in life, and the interdependency weakens as individuals age. Therefore, in later life, social support can be expected to be(come) less effective. This finding is supported by several studies that have shown social support interventions to be unrelated to older adults' health (Frasure-Smith et al., 1997; Glass et al., 2004), challenging claims about the later-life health benefits of intergenerational relationships. Nevertheless, social support remains relatively stable across the life course. In particular, intergenerational relationships are quite resistant to external changes (e.g., health changes; Kahn & Antonucci, 1980). Hence, policy interventions should focus on strengthening intergenerational ties in the early life course, thereby strengthening the likelihood of social support later in life. Moreover, as the health of older adults with weak intergenerational relationships declines, health interventions should address other potential support ties (e.g., other family members, friends). Against this background, an important next step for understanding the linkages between health and social support is to examine the role of life course transitions (e.g., Hwang et al., 2022) and how health and support inequalities evolve over the life course.

Notwithstanding the contributions to the literature, this study has several limitations that need further clarification by future studies. First, as is common in major aging surveys, sample attrition cannot be avoided. Research has shown that respondents with poor health are *more* likely, and respondents who value social relationships and helpfulness are *less* likely to drop out from the sample (Beller et al., 2022; Beller & Geyer, 2021). However, in the current sample receiving instrumental help from adult children was not associated with attrition. Nevertheless, results should be interpreted with caution. When respondents with better health are more likely to stay in the sample, the effect of SRH on instrumental help from children and vice versa may be *under*estimated. Moreover, although I account for missing values using FIML, FIML is not robust when it comes to nonrandom missing variables. Nevertheless, FIML has been supported for aging survey, with mortality attrition (Feng et al., 2006). Second, due to data availability, this study focuses on health and support exchanges across temporal lags of three years. Although interdependent effects between older adults' SRH and instrumental help from children may balance each other out over time (Umberson et al., 2010), future research has to look into this more specifically[v]. Moreover, a longer temporal lag between waves may more accurately capture the interplay between SRH and instrumental support, as SRH has been shown to be rather stable over time (Spuling et al., 2017). Third, social support is multidimensional, including structure, quality, and type of relationships (Kahn & Antonucci, 1980). Against this background, the lack of information on the intensity of instrumental support received from adult children and the quality of relationship between aging parents and their adult children are particularly unfortunate.

As the current study demonstrates, we have only just begun to understand the complex interplay and trajectories of health and social support across the life course. The results underscore the need for a) more advanced methodological research on the interrelationship between older adults' health and social support to uncover mechanisms driving this relationship and b) more studies on the evolution of health and support inequalities across the life course. Nevertheless, this study suggests that future health policies should focus more on early life interventions, particularly as population aging is increasing the number of dependent older adults in need of social support.

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i. Due to the richness of the variables of the main model, I lose many observations. However, a model without time-varying covariates (n=4,479) arrives at the same results (see Supplementary Table A2-7).

ii. *Note.* This potentially includes respondents who received help from other family members or friends, or respondents who have outsourced help to formal providers. I cross-validated the results, comparing those receiving help from adult children to those who did not receive help at all; the results remained the same (see Supplementary Table A2-8).

iii. *Note.* Descriptive sample statistics can be found in the Supplementary Material (Table A2-9)

iv. Weighted Least Square parameter estimates using a diagonal weight matrix with standard errors and mean- and variance-adjusted chi-square test statistic.

v. *Note.* Sensitivity analyses suggest a simultaneous interplay, as coefficients remain relatively stable across waves (see Supplementary Table A2-6).

2.11. Appendix

A2-1. Description of ML-SEM

This study estimates the reciprocal relationship between SRH (x) and instrumental help from children (y) for each individual i at time t, based on the following equations:

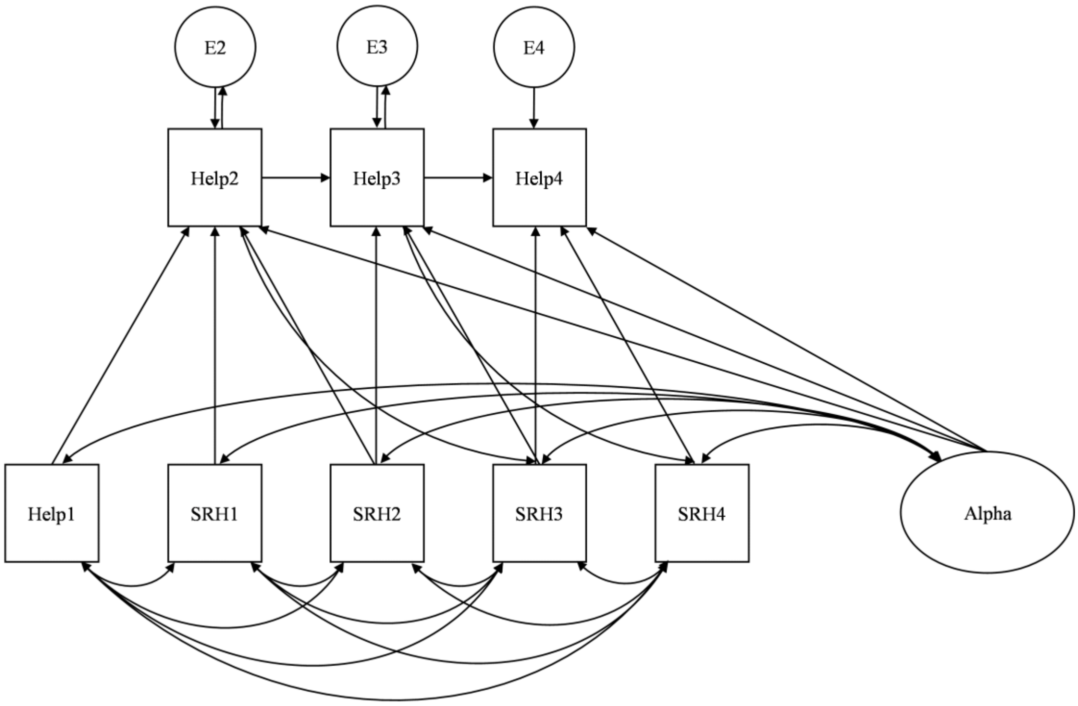
$$(1)\ y_{it} = \alpha_t^{(y)} + \beta_{y1}^{(y)} y_{it-1} + \beta_{x1}^{(y)} x_{it-1} + \beta_{x1}^{(y)} x_{it} + u_{it}^{(y)} + \eta_i^{(y)}$$

$$(2)\ x_{it} = \alpha_t^{(x)} + \beta_{x1}^{(x)} x_{it-1} + \beta_{y1}^{(x)} y_{it-1} + \beta_{y1}^{(x)} y_{it} + u_{it}^{(x)} + \eta_i^{(x)}$$

The equations account for several factors: First, ML-SEM includes the so-called *occasion effect* α_t. α_t accounts for the observed-variable intercept with factors that have a similar effect on all individuals at time t. Second, ML-SEM accounts for the *autoregressive effects* effect of the dependent variable on itself at a later time point, i.e., the autoregressive effect of SRH ($\beta_{x1}^{(x)} x_{it-1}$) and instrumental help from children ($\beta_{y1}^{(y)} y_{it-1}$). Third, ML-SEM considers *cross-lagged effects* of SRH at t-1 on instrumental help at t ($\beta_{x1}^{(y)} x_{it-1}$) and vice versa ($\beta_{y1}^{(x)} y_{it-1}$). Put simply, cross-lagged effects assume that y_t and x_t may partly be predicted by another variable's lagged values. Fourth, u_{it} captures *impulses* that vary over unit and time. Fifth, *unit specific factors* (i.e., fixed effects) are accounted for in the term η_i (Shamsollahi et al., 2021). Finally, to account for misspecified temporal lags, the contemporaneous effect of SRH on instrumental help ($\beta_{x1}^{(y)} x_{it}$) and vice versa ($\beta_{y1}^{(x)} y_{it}$) was included (Vaisey & Miles, 2017).

Figure A2-1 shows how instrumental help (Help) predicts SRH over time. Here, I consider both the contemporaneous and cross-lagged effect of instrumental help, as well as the autoregressive effect of SRH. Alpha covers the unobserved individual confounders (i.e., fixed effects).

Figure A2-1. ML-SEM between instrumental help (DV) and SRH (IV)



A2-2. Robustness analyses

To test the robustness of the analyses, I ran several additional robustness checks. First, I cross-validated the use of ML-SEM with a *fixed effects* estimator by running the same model using ML-SEM with a *random effects* estimator. When comparing the cross-lagged effects from the random effects and fixed effects model, the effect of SRH on instrumental help was similar in effect size, however, not in significance. In the random effects model, the cross-lagged effect of SRH on instrumental help was significant. However, the cross-lagged effect of instrumental help on SRH showed different patterns, with non-significance in both models. By conducting a likelihood ratio test, I tested the fixed effects and random effects estimator against each other. The fixed effects estimator showed a clear advantage over the random effects estimator. Second, I conducted robustness checks using the WLSMV estimator. Overall, the insignificant cross-lagged trends of ML-SEM were confirmed. Third, I ran additional analyses with a robust ML estimation, as the ML estimator assumes a normal distribution. The analyses supported the insignificant cross-lagged trends. Fourth, as in the main analysis, I restricted the error variances to be equal across waves, I reran the analysis relaxing this constraint. The results remained the same. Fifth, I ran a first-difference model with lagged independent variables, to check, whether the autoregressive effect affect the cross-lagged effects; however, the cross-lagged patterns remained the same. Sixth, I cross-validated the results with several health outcomes, such as depressive symptoms and number of physical impairments. *Depressive symptoms* were measured, using the German version of the CES-D (Center for Epidemiologic Studies Depression) scale (0-45). The *number of physical impairments* was measured, based on a list of several diseases (0-11). Overall, the results remained the same. Seventh, I tested the same model with a balanced panel dataset, to cross-validate the use of FIML. This did not change the cross-lagged results. Eight, I reran the analysis with a sample of adults aged 65 or older. I had to exclude the employment status as a time-varying covariate as it had zero variance. The results confirmed no bidirectional relationship between older adults' SRH and instrumental help from adult children. However, the autoregressive effect of instrumental help was no longer significant. When running the analysis for individuals aged 40 to 65 years, we find patterns that can be compared to the overall sample. Whereas the autoregressive effect of instrumental help gains in effect size, but loses in significance, the autoregressive effect of SRH is not significant for this age group. Ninth, I transferred the five-point scale of SRH into a dummy variable (0 = Poor or Very poor; 1 = otherwise). Dichotomizing SRH did not change the results. Tenth, I constructed another dichotomized variable for instrumental help from adult children, which excluded all individuals that have received help from others; this did not change the results. Eleventh, I relaxed the constraints on the independent effects, to let them differ across waves. However, the patterns remain the same. Finally, I lose many observations (n=563) due to the inclusion of several time-varying covariates in the main model. Hence, I cross-validated the findings using a model without any covariates (n=4,479). The autoregressive effects of both instrumental help and SRH increase in effect size, and partly in significance (i.e., instrumental help). However, the cross-lagged results remain the same (all tables can be found below).

Table A2-1. ML-SEM of instrumental help and CES-D

	Instrumental help	CES-D
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.052*	-
	(0.021)	-
CES-D	-	0.130***
	-	(0.019)
Cross-lagged effect		
Instrumental help	-	-0.331
	-	(0.321)
CES-D	0.003*	-
	(0.001)	-
Contemporaneous effect		
Instrumental help	-	0.381
	-	(0.404)
CES-D	0.003	-
	(0.002)	-
Time-varying control		
Age	0.021**	-0.323**
	(0.007)	(0.113)
Partner	-0.003	-0.052
	(0.025)	(0.371)
Coresidence	-0.043*	0.264
	(0.018)	(0.272)
Employment	0.006	0.507
	(0.019)	(0.277)
Relative poverty	0.004	-0.144
	(0.022)	(0.327)
Self-rated health	-0.007	-1.976***
	(0.008)	(0.109)
Physical impairment	-0.005	0.194**
	(0.004)	(0.059)
Contact to children	0.015*	-0.060
	(0.006)	(0.089)
Emotional support	0.043***	0.301*
	(0.010)	(0.148)
Goodness-of-fit		
$\chi 2$ (df)	61.719(53)	76.178(53)*
RMSEA	0.006	0.011
CFI	0.992	0.994
TLI	0.984	0.990

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* p < .05; ** p < .01; *** p < .001.

Table A2-2. ML-SEM of instrumental help and physical impairment

	Instrumental help	Physical impairment
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.055**	-
	(0.021)	-
Physical impairment	-	0.233***
	-	(0.026)
Cross-lagged effect		
Instrumental help	-	0.104
	-	(0.089)
Physical impairment	0.002	-
	(0.006)	-
Contemporaneous effect		
Instrumental help	-	-0.022
	-	(0.103)
Physical impairment	0.000	-
	(0.009)	-
Time-varying control		
Age	0.019**	0.133***
	(0.007)	(0.035)
Partner	-0.006	-0.139
	(0.025)	(0.110)
Coresidence	-0.044*	0.099
	(0.018)	(0.081)
Employment	0.008	-0.003
	(0.019)	(0.083)
Relative poverty	0.003	-0.040
	(0.022)	(0.100)
CES-D	0.002*	0.013**
	(0.001)	(0.004)
Self-rated health	-0.006	-0.141***
	(0.008)	(0.034)
Contact to children	0.016*	0.022
	(0.006)	(0.027)
Emotional support	0.044***	-0.064
	(0.010)	(0.044)
Goodness-of-fit		
$\chi 2$ (df)	61.194(53)	175.034(53)***
RMSEA	0.006	0.024
CFI	0.992	0.979
TLI	0.985	0.960

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* p < .05; ** p < .01; *** p < .001.

Table A2-3. ML-SEM of instrumental help and SRH, error variances not constrained

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.049*	-
	(0.021)	-
Self-rated health	-	0.098***
	-	(0.019)
Cross-lagged effect		
Instrumental help	-	0.048
	-	(0.041)
Self-rated health	-0.010	-
	(0.010)	-
Contemporaneous effect		
Instrumental help	-	-0.008
	-	(0.052)
Self-rated health	-0.015	-
	(0.015)	-
Time-varying control		
Age	0.021**	0.020
	(0.007)	(0.015)
Partner	-0.007	0.002
	(0.025)	(0.047)
Coresidence	-0.044*	0.002
	(0.018)	(0.034)
Employment	0.007	0.021
	(0.019)	(0.035)
Relative poverty	0.005	0.029
	(0.022)	(0.042)
CES-D	0.002*	-0.032***
	(0.001)	(0.002)
Physical impairment	-0.005	-0.026**
	(0.004)	(0.008)
Contact to children	0.016**	-0.009
	(0.006)	(0.011)
Emotional support	0.044***	0.021
	(0.010)	(0.019)
Goodness-of-fit		
$\chi 2$ (df)	61.544(51)	59.795(51)
RMSEA	0.007	0.007
CFI	0.990	0.998
TLI	0.980	0.997

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Table A2-4. ML-SEM of instrumental help and SRH, WLSMV

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.053	-
	(0.079)	-
Self-rated health	-	0.104**
	-	(0.032)
Cross-lagged effect		
Instrumental help	-	0.215
	-	(0.368)
Self-rated health	-0.210	-
	(0.919)	-
Contemporaneous effect		
Instrumental help	-	-0.402
	-	(0.565)
Self-rated health	-0.425	-
	(1.854)	-
Time-varying control		
Age	0.048	0.433
	(0.213)	(0.499)
Partner	-0.319	0.566
	(1.463)	(0.852)
Coresidence	-0.976	0.090
	(4.309)	(0.381)
Employment	-0.242	3.147
	(1.174)	(3.524)
Relative poverty	0.108	0.910
	(0.555)	(1.087)
CES-D	0.008	-0.190
	(0.037)	(0.206)
Physical impairment	-0.068	-0.311
	(0.294)	(0.345)
Contact to child	0.239	0.069
	(1.045)	(0.109)
Emotional support	0.528	-0.037
	(2.300)	(0.140)
Goodness-of-fit		
$\chi 2$ (df)	30.567(29)	59.880(31)**
RMSEA	0.004	0.015
CFI	1.000	0.997
TLI	0.999	0.991

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Table A2-5. Variable composition for SRH and instrumental help

Variables		Range	Mean	SD
Self-rated health		1 – 5		
	overall		3.51	0.81
	between			0.68
	within			0.47
Instrumental help		0 – 1		
	overall		0.11	0.31
	between			0.22
	within			0.23

Note. N=3,914; Observations=12,664.

Table A2-6. ML-SEM of instrumental help and SRH, cross-lagged effect is allowed to differ across waves

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.055**	-
	(0.021)	-
Self-rated health	-	0.100***
	-	(0.020)
Cross-lagged effect		
Wave 1		
Instrumental help	-	0.043
	-	(0.058)
Self-rated health	-0.006	-
	(0.013)	-
Wave 2		
Instrumental help	-	0.000
	-	(0.058)
Self-rated health	-0.007	-
	(0.017)	-
Wave 3		
Instrumental help	-	0.291
	-	(0.188)
Self-rated health	0.015	-
	(0.032)	-
Goodness-of-fit		
$\chi 2$ (df)	55.734(31)**	38.064(31)
RMSEA	0.014	0.008
CFI	0.976	0.999
TLI	0.924	0.996

Note. Unstandardized coefficient, covariates include proximate effect of dependent variables, age at baseline, gender and education SE = standard error, $\chi 2$ = Chi-square value, df = degrees of freedom, CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Table A2-7. ML-SEM of instrumental help and SRH, without covariates

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.078***	-
	(0.021)	-
Self-rated health	-	0.117***
	-	(0.020)
Cross-lagged effect		
Instrumental help	-	0.024
	-	(0.046)
Self-rated health	-0.003	-
	(0.010)	-
Contemporaneous effect		
Instrumental help	-	-0.051
	-	(0.061)
Self-rated health	-0.009	-
	(0.015)	-
Goodness-of-fit		
$\chi 2$ (df)	12.171(8)	11.360(8)
RMSEA	0.011	0.010
CFI	0.995	0.999
TLI	0.989	0.998

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=4,479.
* p < .05; ** p < .01; *** p < .001.

Table A2-8. ML-SEM of instrumental help and SRH, excluding respondents that have received help from others

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.054*	-
	(0.025)	-
Self-rated health	-	0.094***
	-	(0.018)
Cross-lagged effect		
Instrumental help	-	0.059
	-	(0.045)
Self-rated health	-0.014	-
	(0.011)	-
Contemporaneous effect		
Instrumental help	-	0.003
	-	(0.060)
Self-rated health	-0.018	-
	(0.016)	-
Time-varying control		
Age	0.029**	0.021
	(0.008)	(0.015)
Partner	-0.009	0.006
	(0.030)	(0.047)
Coresidence	-0.048*	0.002
	(0.021)	(0.034)
Employment	0.011	0.024
	(0.022)	(0.035)
Relative poverty	-0.002	0.029
	(0.025)	(0.042)
CES-D	0.003**	-0.031***
	(0.001)	(0.002)
Physical impairment	-0.004	-0.026**
	(0.005)	(0.008)
Contact to children	0.018*	-0.009
	(0.007)	(0.011)
Emotional support	0.053***	0.020
	(0.012)	(0.019)
Goodness-of-fit		
$\chi 2$ (df)	76.200(53)*	66.432(53)
RMSEA	0.011	0.008
CFI	0.980	0.997
TLI	0.963	0.995

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* p < .05; ** p < .01; *** p < .001.

Table A2-9. Descriptive sample statistics (unweighted)

Time varying control	Baseline	+1	+2	+3
Partner (Yes/No)				
N	3,492	3,453	3,159	2,541
%	79.0	77.6	75.4	72.9
Co-resident children (Yes/No)				
N	3,481	3,449	3,163	2,532
%	24.1	17.4	13.3	9.4
Employment (Yes/No)				
N	3,491	3,449	3,170	2,540
%	35.0	28.5	26.0	21.6
Poverty (Yes/No)				
N	3,251	3,264	3,026	2,429
%	8.0	8.9	8.0	6.9
CES-D (0-45)				
N	3,492	3,448	3,173	2,541
Mean (SD)	6.1 (5.8)	6.5 (6.0)	6.5 (5.9)	6.6 (5.9)
Physical impairment (0-11)				
N	2,993	2,968	2,789	2,248
Mean (SD)	2.4 (1.8)	2.6 (1.8)	2.8 (1.9)	2.9 (2.1)
Contact to child (1-6)				
N	3,463	3,448	3,170	2.538
Mean (SD)	5.1(1.0)	5.0(1.1)	5.0(1.1)	5.0(1.0)
Emotional support (Yes/No)				
N	3,455	3,438	3,156	2,529
%	30.8	33.4	39.0	40.3

Note. SD = standard deviation.

Table A2-10. First-Difference model with lagged independent variables of instrumental help and SRH

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Cross-lagged effect		
Self-rated health	-0.008	-
	(0.010)	-
Instrumental help	-	0.051
	-	(0.036)
Contemporaneous effect		
Self-rated health	-0.007	-
	(0.010)	-
Instrumental help	-	0.012
	-	(0.033)
Time-varying control		
Age	0.001	-0.072***
	(0.009)	(0.016)
Partner	-0.002	-0.046
	(0.016)	(0.028)
Coresidence	-0.039	-0.036
	(0.023)	(0.041)
Employment	0.014	-0.046
	(0.021)	(0.038)
Poverty	-0.022	0.022
	(0.027)	(0.048)
CES-D	0.002	-0.021***
	(0.001)	(0.002)
Physical impairment	-0.004	0.020**
	(0.004)	(0.007)
Contact to children	0.012	0.012
	(0.007)	(0.012)
Emotional support	-0.004	0.009
	(0.014)	(0.024)
N	3,782	3,782
R^2	0.003	0.029

Note. b = coefficients; se = standard error, CES-D = Center for Epidemiologic Studies Depression Scale.
* p < .05; ** p < .01; *** p < .001.

Table A2-11. ML-SEM of instrumental help and SRH, random effects

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.073***	-
	(0.021)	-
Self-rated health	-	0.234***
	-	(0.019)
Cross-lagged effect		
Instrumental help	-	-0.018
	-	(0.025)
Self-rated health	-0.012*	-
	(0.005)	-
Contemporaneous effect		
Instrumental help	-	-0.058**
	-	(0.023)
Self-rated health	-0.012*	-
	(0.005)	-
Time-varying control		
Age	0.025***	-0.021*
	(0.005)	(0.010)
Partner	-0.052***	-0.037*
	(0.008)	(0.017)
Coresidence	-0.050***	0.011
	(0.011)	(0.022)
Employment	0.033**	0.039
	(0.010)	(0.021)
Relative poverty	-0.002	-0.082**
	(0.013)	(0.026)
CES-D	0.003***	-0.042***
	(0.001)	(0.001)
Physical impairment	0.010***	-0.090***
	(0.002)	(0.005)
Contact to children	0.029***	-0.009
	(0.003)	(0.007)
Emotional support	0.063***	0.029*
	(0.007)	(0.014)
Goodness-of-fit		
$\chi 2$ (df)	145.381(84)***	291.031(83)***
RMSEA	0.014	0.025
CFI	0.941	0.960
TLI	0.931	0.953

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* p < .05; ** p < .01; *** p < .001.

Table A2-12. ML-SEM of instrumental help and SRH, without FIML

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.047	-
	(0.031)	-
Self-rated health	-	0.089**
	-	(0.027)
Cross-lagged effect		
Instrumental help	-	-0.001
	-	(0.063)
Self-rated health	-0.023	-
	(0.015)	-
Contemporaneous effect		
Instrumental help	-	-0.051
	-	(0.081)
Self-rated health	-0.030	-
	(0.023)	-
Time-varying control		
Age	0.015	0.003
	(0.019)	(0.033)
Partner	0.000	0.167*
	(0.041)	(0.070)
Coresidence	-0.077*	-0.058
	(0.031)	(0.054)
Employment	0.037	-0.044
	(0.030)	(0.052)
Relative poverty	0.065	0.087
	(0.039)	(0.068)
CES-D	0.003	-0.027***
	(0.002)	(0.003)
Physical impairment	-0.002	-0.025*
	(0.006)	(0.010)
Contact to children	0.024*	0.003
	(0.010)	(0.018)
Emotional support	-0.001	0.030
	(0.016)	(0.028)
Goodness-of-fit		
$\chi 2$ (df)	75.860(53)*	76.850(53)*
RMSEA	0.020	0.021
CFI	0.944	0.987
TLI	0.895	0.975

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=1,054.
* p < .05; ** p < .01; *** p < .001.

Table A2-13. ML-SEM of instrumental help and SRH, 65+ older adults

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.023	-
	(0.027)	-
Self-rated health	-	0.086**
	-	(0.027)
Cross-lagged effect		
Instrumental help	-	0.064
	-	(0.054)
Self-rated health	-0.012	-
	(0.015)	-
Contemporaneous effect		
Instrumental help	-	0.028
	-	(0.065)
Self-rated health	-0.027	-
	(0.022)	-
Time-varying control		
Age	0.029*	-0.024
	(0.011)	(0.022)
Partner	0.010	-0.074
	(0.033)	(0.060)
Coresidence	-0.034	0.012
	(0.038)	(0.069)
Relative poverty	-0.033	0.059
	(0.033)	(0.061)
CES-D	0.002	-0.033***
	(0.001)	(0.002)
Physical impairment	-0.008	-0.010
	(0.005)	(0.010)
Contact to children	0.021**	-0.001
	(0.008)	(0.014)
Emotional support	0.053***	0.005
	(0.013)	(0.024)
Goodness-of-fit		
$\chi2$ (df)	61.371(48)	61.493(48)
RMSEA	0.009	0.009
CFI	0.981	0.996
TLI	0.965	0.992

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,334. * p < .05; ** p < .01; *** p < .001.

Table A2-14. ML-SEM of instrumental help and SRH, individuals aged 40-65 years

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.088*	-
	(0.038)	-
Self-rated health	-	0.056
	-	(0.030)
Cross-lagged effect		
Instrumental help	-	0.071
	-	(0.094)
Self-rated health	0.011	-
	(0.015)	-
Contemporaneous effect		
Instrumental help	-	-0.038
	-	(0.126)
Self-rated health	0.019	-
	(0.020)	-
Time-varying control		
Age	0.026	0.021
	(0.022)	(0.043)
Partner	-0.048	0.123
	(0.042)	(0.082)
Coresidence	-0.054*	0.013
	(0.023)	(0.045)
Employment	-0.014	0.076
	(0.026)	(0.050)
Relative poverty	0.014	0.005
	(0.032)	(0.063)
CES-D	0.003	-0.030***
	(0.001)	(0.003)
Physical impairment	-0.001	-0.039**
	(0.007)	(0.014)
Contact to children	0.011	-0.035
	(0.010)	(0.020)
Emotional support	0.025	0.032
	(0.017)	(0.033)
Goodness-of-fit		
$\chi 2$ (df)	54.410(53)	62.894(53)
RMSEA	0.004	0.010
CFI	0.994	0.995
TLI	0.989	0.990

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=2,024.
* p < .05; ** p < .01; *** p < .001.

Table A2-15. ML-SEM of instrumental help and SRH (dichotomized)

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.054**	-
	(0.021)	-
Self-rated health	-	0.085***
	-	(0.021)
Cross-lagged effect		
Instrumental help	-	-0.003
	-	(0.018)
Self-rated health	-0.011	-
	(0.025)	-
Contemporaneous effect		
Instrumental help	-	-0.031
	-	(0.022)
Self-rated health	-0.022	-
	(0.033)	-
Time-varying control		
Age	0.022**	0.008
	(0.007)	(0.006)
Partner	-0.006	-0.019
	(0.025)	(0.021)
Coresidence	-0.044*	0.000
	(0.018)	(0.015)
Employment	0.007	-0.022
	(0.019)	(0.016)
Relative poverty	0.005	0.022
	(0.022)	(0.019)
CES-D	0.002*	-0.012***
	(0.001)	(0.001)
Physical impairment	-0.004	-0.004
	(0.004)	(0.003)
Contact to children	0.016**	0.005
	(0.006)	(0.005)
Emotional support	0.044***	0.007
	(0.010)	(0.008)
Goodness-of-fit		
$\chi 2$ (df)	70.654(53)	60.770(53)
RMSEA	0.009	0.006
CFI	0.983	0.997
TLI	0.969	0.995

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914.
* p < .05; ** p < .01; *** p < .001.

Table A2-16. ML-SEM of instrumental help and SRH, robust ML

	Instrumental help	Self-rated health
	B/(SE)	*B/(SE)*
Autoregressive effect		
Instrumental help	0.054	-
	(0.028)	-
Self-rated health	-	0.093***
	-	(0.020)
Cross-lagged effect		
Instrumental help	-	0.051
	-	(0.044)
Self-rated health	-0.010	-
	(0.009)	-
Contemporaneous effect		
Instrumental help	-	-0.004
	-	(0.057)
Self-rated health	-0.014	-
	(0.014)	-
Time-varying control		
Age	0.021**	0.021
	(0.007)	(0.015)
Partner	-0.006	0.003
	(0.031)	(0.053)
Coresidence	-0.044*	0.002
	(0.019)	(0.036)
Employment	0.008	0.024
	(0.019)	(0.035)
Relative poverty	0.005	0.029
	(0.026)	(0.048)
CES-D	0.002*	-0.031***
	(0.001)	(0.002)
Physical impairment	-0.005	-0.026**
	(0.004)	(0.008)
Contact to children	0.016**	-0.009
	(0.005)	(0.011)
Emotional support	0.044***	0.020
	(0.010)	(0.019)
Goodness-of-fit		
$\chi 2$ (df)	59.582(53)	62.427(53)
RMSEA	0.006	0.007
CFI	0.993	0.998
TLI	0.987	0.996

Note. Unstandardized coefficient; CFI = Comparative Fit Index, TLI =Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, CES-D = Center for Epidemiologic Studies Depression Scale; N=3,914. * p < .05; ** p < .01; *** p < .0

Chapter 3

Adult intergenerational proximity and parents' depressive symptoms: A bidirectional approach

Lisa Jessee, Valeria Bordone & Karsten Hank

Abstract

To date, only a few studies have investigated the bidirectional relationship in the intergenerational proximity-health nexus, specifically how geographic proximity affects older parents' depressive symptoms and vice versa. Drawing on eight waves (2004-2018) of the U.S. Health and Retirement Study (n=17,671), we examine several mechanisms ('mobilization', 'social support', and 'social breakdown') that drive the complex relationship between intergenerational proximity and parental depressive symptoms. Dynamic panel models with fixed effects in a structural equation modeling context provided some weak evidence of a 'mobilization effect' (that is, parents', especially fathers', depression triggering greater proximity, including coresidence) and somewhat clearer evidence for a 'social breakdown effect' of coresidential transitions on parents' depressive symptoms (particularly among 'Whites' and fathers). We found no evidence to support the notion of a 'social support mechanism' (predicting that greater proximity or the transition to coresidence would decrease the number of parents' depressive symptoms).

3.1. Introduction

Because aging parents increasingly risk facing health limitations, including mental health challenges, they are more likely to need functional support from their adult children, which ranges from occasional help with domestic chores to regular personal care (Wolff et al., 2016). An important prerequisite for the availability of such intergenerational support is geographic proximity (Heylen et al., 2012). Despite indications of recent increases in distance to kin, especially in high-income 'White' households (Spring, Ackert, et al., 2023), close intergenerational residential proximity beyond coresidence remains common across the life course (Choi et al., 2020, 2021), and rates of intergenerational coresidence among older adults in the U.S. nearly doubled from 1988 to 2018 (Eickmeyer & Brown, 2019).

Proximity between older parents and adult children may change in response to older parents' deteriorating (mental) health, with family members moving in with or closer to each other to secure support (Choi et al., 2015; Reyes & Shang, 2023; Silverstein, 1995; Zhang et al., 2013). The onset of parental mental health challenges would consequently trigger the activation of their support network ('*mobilization mechanism*'; see Elder, 1998; Litwak & Longino, 1987; Schwarzer & Leppin, 1991). At the same time, older adults' (mental) health may respond to changes in intergenerational residential proximity, including coresidence transitions. Whereas some studies point to a positive association between intergenerational proximity and older adults' psychological well-being (Liang & Zhang, 2017; van der Pers et al., 2015), research investigating the longitudinal effects of intergenerational coresidence on older adults' mental health provides evidence of both salutary (Courtin & Avendano, 2016; Sun & Zimmer, 2022) and harmful (Caputo, 2019; Tosi & Grundy, 2018) effects. These phenomena can be explained by two alternative mechanisms, which may even operate simultaneously. The '*social support mechanism*' posits that closer intergenerational proximity can alleviate parental depressive symptoms through family support and daily interaction (Cohen & McKay, 1984), whereas the '*social breakdown mechanism*' suggests that increased intergenerational proximity may exacerbate parental depressive symptoms, possibly due to the stress and conflict created by close, ongoing interaction or due to the loss of autonomy and independence (Luo et al., 2022; Silverstein et al., 1996).

In this study, we aimed to assess the abovementioned mechanisms and how they shape the complex bidirectional relationship between adult intergenerational proximity and parental depressive symptoms. Importantly, we address the previously neglected issue of reverse causality in the proximity-health nexus. Failing to account for reverse causality constitutes an important shortcoming in previous research, which leads to seriously biased results and spurious conclusions regarding the interplay between intergenerational social support and older adults' health (Jessee, 2023). Thus, recent research has called for more robust methodological designs (Kong et al., 2024). Understanding the bidirectional nature of intergenerational proximity and parental depressive symptoms clarifies whether increased proximity acts as a cause *or* consequence or as a cause *and* consequence of mental health challenges, thus informing effective family support interventions and policies aiming to promote older adults' mental health.

Drawing on eight waves of the U.S. Health and Retirement Study (HRS) collected between 2004 and 2018, the present study challenges prior unidirectional approaches by applying dynamic panel models with fixed effects in a structural equation modeling context. Using a sample of 17,671 respondents, we examine how changes in intergenerational proximity to the closest living adult child, including coresidential transitions, are related to changes in parents' depressive symptoms. Given previous research suggesting differences by parents' gender and race/ethnicity in both adult intergenerational proximity/coresidence (Caputo & Cagney, 2023; Hank, 2007; Spring, Gillespie, et al., 2023) and later-life depression (Acciai & Hardy, 2017; Hooker et al., 2019), we tested how mechanisms may differ in the extent to which they affect specific subgroups.

3.2. Intergenerational proximity and depressive symptoms

Residential proximity between parents and adult children has long been shown to exhibit considerable variation across the life course (Choi et al., 2021). In later life, both generations of family members tend to adjust geographic distance to facilitate intergenerational support and address emotional needs, often in anticipation of (Zhang et al., 2013) or response to (Reyes & Shang, 2023) parental mental health challenges, but in particular, physical health declines (Spring, Gillespie, et al., 2023). Similar to evidence from the U.S., such patterns in coresidence transitions have also been found in Europe (Artamonova et al., 2020; Vergauwen & Mortelmans, 2020) and Asia (e.g., Kumar & Williams, 2021; Wang, 2022; Zimmer & Korinek, 2010).

The observed dynamics are consistent with Litwak & Longino's (1987) developmental perspective on migration patterns in later life as well as the notion of a 'mobilization effect' (Schwarzer & Leppin, 1991), where the onset of physical or psychiatric conditions mobilizes one's support network. Parents may also decide to relocate closer to their children, although recent research indicates that children primarily relocate closer to their parents following a health shock (Reyes & Shang, 2023). Thus, an increase in the number of depressive symptoms would predict an increase in intergenerational proximity or the likelihood of coresidence ('*mobilization mechanism*').

At the same time, intergenerational proximity may affect older adults' health through various mechanisms. Greater residential proximity has been suggested to be causally interrelated with more frequent intergenerational contact and higher levels of affection (Lawton et al., 1994; also see Schafer & Sun, 2022). Having at least one child living in closer proximity may consequently provide parents with geographically close and secure social ties (Dunér & Nordström, 2007) as well as a feeling of security and belonging (van der Pers et al., 2015). Even if actual support may not (yet) be necessary, such feelings can be important for parents' perceptions of the (potential) availability of social support, which has been shown to have protective effects on older adults' mental health (Fiori et al., 2006). This finding is consistent with the concept of a "kinship reservoir" – the mere existence of intergenerational ties – as a predictor of well-being and health in old age (Hünteler & Hank, 2023). This effect may be even more pronounced when aging parents and their adult children live nearby, making the kinship reservoir more readily accessible.

Moreover, intergenerational proximity is associated with the actual exchange of emotional and instrumental support (Heylen et al., 2012; Schafer & Sun, 2022; Schoeni et al., 2022). Such support may slow disablement processes, reduce the negative burden of experiencing functional limitations (Verbrugge & Jette, 1994), and strengthen older adults' psychological well-being (Chen & Silverstein, 2000; but see Jessee, 2023). In addition, social support may buffer the negative effects of stress (Cohen & McKay, 1984). Finally, greater intergenerational proximity also increases older adults' propensity to provide social support to their adult children (Heylen et al., 2012), which some research has suggested to be positively associated with mental health due to the feeling of being needed and useful (Bangerter et al., 2015; but see Bordone & Arpino, 2019).

Whereas some studies indeed point to a positive association between intergenerational proximity and older adults' mental well-being (Liang & Zhang, 2017; van der Pers et al., 2015), close proximity to adult children may also – unintendedly – negatively affect parents' health. This negative relationship might particularly arise if struggling children returning to the parental home demand material or emotional support (Caputo, 2019; Tosi & Grundy, 2018) or if children's provision of support becomes "too much of a good thing", limiting the older generation's autonomy and independence (Luo et al., 2022; Silverstein et al., 1996; Bordone, 2015). Bengtson & Kuypers (1985) refer to this latter mechanism as 'social breakdown'. Accordingly, research investigating the longitudinal effects of intergenerational coresidence on older adults' mental health and well-being provides evidence of both salutary and harmful effects (Caputo, 2019; Courtin & Avendano, 2016; Tosi & Grundy, 2018).

Against this background, we assume two complementary mechanisms. According to the '*social support mechanism*', an increase in intergenerational proximity, including the transition to coresidence, predicts a *decrease* in the number of parents with depressive symptoms, whereas the '*social breakdown mechanism*' suggests that an increase in intergenerational proximity, including the transition to coresidence, predicts an *increase* in parents' depressive symptoms. These mechanisms are not mutually exclusive and may vary in the degree to which they affect specific subgroups, which is briefly discussed in the following section.

3.3. Differences among sociodemographic subgroups

Geographic proximity between aging parents and their adult children has been found to differ by parents' *gender* and *race/ethnicity*, for example. Variations between sociodemographic subgroups highlight multiple factors that may alter the dynamics for aging parents and adult children to consider relocating closer to each other, as well as the potential responses of parents to changes in geographic proximity.

3.3.1. Parents' gender

While the differences in how mothers and fathers experience and respond to geographic proximity with their adult children and vice versa have not yet been fully explored, they are still important to consider. Compared with fathers, mothers are more likely to exhibit elevated levels of depression (Acciai & Hardy, 2017) and are also more likely to coreside with their adult children (Caputo, 2019; Caputo & Cagney, 2023). Mothers also tend to receive more emotional and instrumental support (Liebler & Sandefur, 2002; Silverstein et al., 1995). This increased support is often attributed to women's adeptness at seeking assistance when faced with challenges (Thoits, 1995). Against this background, mothers might be expected to be more likely to geographically converge with their adult children following a decline in mental health. However, recent studies have shown that both mothers and fathers are equally likely to geographically converge with their children when they experience severe health problems (e.g., Artamonova et al., 2020; Choi et al., 2015).

Conversely, mothers might experience a greater sense of loss of independence when living "too close" to their children, which may be accompanied by "too much" support, especially instrumental support. This excessive support is attributed to the fact that instrumental support often entails tasks traditionally undertaken by women, such as household chores (Tiedt et al., 2015). This phenomenon is especially evident when women receive more intense instrumental support (Djundeva et al., 2015). While increased contact (due to increased proximity) with adult children may serve as a protective factor for mothers' mental well-being, this effect is not observed in fathers (Tosi & Grundy, 2019). Studies examining gendered patterns in the relationship between geographic proximity and parents' well-being have provided inconclusive results. Research conducted in China indicates that compared to mothers coresiding with their children, women with children living within a range of 100 km (but not cohabiting) exhibit a reduced risk of depression, whereas fathers with children living at least 100 km away face an elevated risk of depressive symptoms compared to those coresiding with their children (Liang & Zhang, 2017). However, studies focusing on cohabitation in the U.S. and Europe found no gender differences in mental health outcomes following the transition to living with an adult child (Caputo, 2019; Courtin & Avendano, 2016; Tosi & Grundy, 2018).

3.3.2. Race/ethnicity

The interplay between geographic proximity and the occurrence of depressive symptoms in older parents may not only be affected by gender but also vary across racial/ethnic lines. Research suggests that 'Nonwhite' minority families are more likely than 'White' families to prioritize physical proximity among family members as an important aspect of intergenerational solidarity (Reyes et al., 2020). This difference is reflected in the greater likelihood of 'Nonwhite' Americans living in close proximity to their nuclear family members, as highlighted in recent studies (Ackert et al., 2019; Spring, Ackert, et al., 2023). Moreover, 'Nonwhite' families in particular are more likely to have an adult child living in their household (Caputo & Cagney, 2023). In 2016, only 16 percent of 'Whites' lived with a member of another generation, whereas this number exceeded 26 percent among 'Nonwhites' (Cohn & Passel, 2018).

These variations in intergenerational proximity and coresidence are generally attributed to the lower socioeconomic status of 'Nonwhite' families (Berry, 2006), which results in more limited access to (formal) sources of support beyond the family network (Spring, Ackert, et al., 2023). Furthermore, 'Nonwhite' families have been suggested to have more resilient and supportive family networks than 'White' families (Swartz, 2009). Specifically, most research suggests that 'Nonwhite' families tend to provide more practical support and maintain a greater frequency of contact than their 'White' counterparts, while 'White' families tend to provide more financial or emotional support, which does not necessarily require physical presence (see e.g., Sarkisian et al., 2007; Sarkisian & Gerstel, 2004; Taylor et al., 2013). As a result, children in 'Nonwhite' families commonly live with or closer to their parents to alleviate financial burdens or provide assistance to their (sometimes frail) parents (Kamo, 2000; Keene & Batson, 2010; Swartz, 2009). However, a more recent study provides contrary evidence, suggesting that 'White' parents exhibited a greater likelihood of experiencing a coresidential transition following a health decline (Reyes & Shang, 2023).

Conversely, a recent study from the U.S. reported that the presence of coresident children was associated with greater depressive symptoms among 'White' parents but not among 'Nonwhite' parents (Caputo & Cagney, 2023). This difference may be due to more positive attitudes toward close intergenerational proximity among family members in 'Nonwhite' families (Reyes et al., 2020) and the assumption that 'White' parents may have more favorable opinions about independent and autonomous living in older age (Cepa & Kao, 2019).

Given the complex and sometimes contradictory findings on subgroup differences related to gender and race/ethnicity, we refrain from developing explicit hypotheses. Instead, we aim to explore and discern which of the three mechanisms proposed above – '*mobilization*', '*social* *support*' and '*social breakdown*' – is more dominant within specific subgroups, thereby providing a nuanced understanding of how the dynamics of intergenerational proximity and parents' mental health operate across diverse subgroups.

3.4. This study

We extend previous research in three important ways. *First*, our study tackles two significant challenges in establishing causality within social science research: *reverse causality* and *omitted variable bias* (Allison et al., 2017). By employing ML-SEM, our modeling approach focuses on rigorously evaluating existing knowledge. Traditional methods, such as fixed effects models and cross-lagged panel models, typically address either omitted variable bias or reverse causality. However, when these issues are not addressed simultaneously, the resulting findings can be biased. While previous studies on intergenerational coresidence and the mental health of older adults have utilized advanced longitudinal methods to address reverse causality (e.g., Aranda, 2015; Courtin & Avendano, 2016; Yuan et al., 2021), research on intergenerational proximity beyond coresidence has largely depended on cross-sectional methods (e.g., Liang & Zhang, 2017; van der Pers et al., 2015; Wei & Tsay, 2022) or longitudinal methods that neglect reverse causality (e.g., Artamonova et al., 2020; Choi et al., 2015; Reyes & Shang, 2023; Spring, Gillespie, et al., 2023). Our methodological approach diverges from traditional longitudinal models, including those solely addressing reverse causality, by enabling simultaneous evaluation of the direction of causality (reverse causality) while controlling for time-invariant confounders (omitted variable bias). This dual focus on omitted variable bias and reverse causality (Allison et al., 2017) enhances our ability to evaluate existing findings and ensures they are not affected by methodological limitations.

Second, we shed light on the longitudinal effects of depressive symptoms on intergenerational proximity, an aspect that has received little attention in previous research. While studies have extensively examined the effects of physical health problems on intergenerational proximity (Artamonova et al., 2020; Choi et al., 2015; Reyes & Shang, 2023; Rogerson et al., 1997; Silverstein, 1995), the longitudinal effects of depressive symptoms have been largely overlooked (see Spring, Gillespie, et al., 2023 for an exception). Because depression is a leading cause of disability (Zenebe et al., 2021), focusing on older adults' depressive symptoms is crucial to identify changes in intergenerational proximity that may offer potential for support and intervention.

Third, previous research has often focused either on intergenerational proximity without distinguishing coresidence (Zhang et al., 2013) or on coresidence alone (Caputo & Cagney, 2023; Tosi & Grundy, 2018). In this study, we recognize that coresidence involves factors beyond physical presence, such as financial benefits and privacy considerations (Compton & Pollak, 2015). Thus, the impact on parents' mental health may differ significantly between those with coresident children and those whose closest children live nearby but in separate households. We examine both aspects – intergenerational proximity and coresidence – which allows for a more nuanced understanding of how different living arrangements affect parental well-being and vice versa.

3.5. Methods

3.5.1. Data

We draw on data from the *Health and Retirement Study (HRS)*, a biennial household panel survey that started in 1992 to capture, among other things, the health status and family relationships of the U.S. population aged 50 and over and their (younger) partners. Response rates at the first baseline interview have declined since 1992, from 82% for the 1992 cohort to 70% for the 1998 cohort (Sonnega et al., 2014). Because older adults with poor (mental) health tend not to participate in surveys such as the HRS, our results may underestimate the true impact of geographic proximity on depressive symptoms. The data for the current study were taken from Wave 7, collected in 2004, through Wave 14, collected in 2018, which are survey waves for which the zip codes of respondents' adult children (see below) are available.

We created the analytic sample based on respondent-level information from the RAND HRS Longitudinal File (2020 V1), merged it with respondents' child information from the RAND HRS Family data (2018 V1), and merged geographic information from restricted data files. Following an approach similar to that of Seltzer and colleagues (2013), we focused on parents with at least one biological adult child (biological families). This approach is based on theories suggesting that stepfamilies generally have weaker solidarity and that the presence of stepchildren may reduce help from biological children. However, evidence also indicates that biological children in stepfamilies might provide more help than those in biological families to compensate for reduced support from stepchildren (Pezzin et al., 2008; Seltzer et al., 2013). Thus, we excluded 9,691 respondents from stepfamilies and respondents without adult (aged 18+) children. Next, we excluded respondents under the age of 50 years (i.e., younger partners of anchor respondents) who did not have a coresident partner meeting the age criteria, as well as respondents who participated in fewer than two survey waves during our observation window (note that a respondent's first observation need not correspond to Wave 7, N=2,356 were excluded). Finally, we excluded 828 respondents who did not provide valid information on our two main variables of interest (intergenerational proximity and depressive symptoms) in any survey wave. Specifically, 521 parents lacked valid data on depressive symptoms, primarily due to proxy interviews in which mental health questions were omitted. Additionally, 307 respondents lacked valid information on intergenerational proximity, often because their children lived beyond the 10-mile threshold and parents did not provide their children's zip code information. Our main results are robust to alternative sample specifications, including only respondents without missing information on our main dependent variables. This process left us with an analytic sample of 17,671 parents who contributed to a total of 92,095 observations. On average, each respondent participated in five waves. Table 3-1 indicates the number and percentage of individuals participating across waves.

Table 3-1. Number and percentage of individuals participating across waves

	N	%
Baseline	17,671	19.2
+1	17,671	19.2
+2	14,363	15.6
+3	12,721	13.8
+4	10,940	11.9
+5	7,669	8.3
+6	6,318	6.9
+7	4,742	5.1
N	92,095	100

Note. Own calculations based on HRS, 2004-2018.

Next to analyzing this full sample of respondents, we also ran separate regressions by parents' gender (10,459 mothers and 7,212 fathers) and race/ethnicity (12,832 'Whites' and 4,839 'Nonwhites', that is, respondents who identified themselves as 'Black/African American' or 'other Race/Ethnicity'). Parents were our unit of analysis, and we focused on changes in geographic proximity to (including coresidence with) their closest living biological child (indicating the spatial availability of potential intergenerational support by any child; see Choi et al., 2015; Hank, 2007). Table 3-2 shows the basic descriptive sample statistics.

3.5.2. Variables

We assume that the mere presence of at least one adult child in close proximity to the parent can adequately satisfy the need for support and contact because it creates opportunity structures for intergenerational relationships. Therefore, we measured *intergenerational proximity* as the distance between parents and their *closest* living child. The unrestricted HRS data only allow us to differentiate between coresidence and living within or beyond a radius of 10 miles. However, changes in intergenerational proximity may extend beyond the 10-mile radius because support can also be provided from children living farther away. Therefore, we used precise location information by accessing restricted data on children's zip codes. First, information on parent–child coresidence was obtained. Second, for all noncoresident children, respondents were asked if they lived within a radius of 10 miles. Third, for each child living more than 10 miles away, the HRS collected the zip code. Based on this restricted zip code

Table 3-2. Descriptive sample statistics for the full sample at (personal) baseline (unweighted)

	%/Mean (SD)	N
Dependent Variables		
Intergenerational proximity		15,723
Coresident	43	
Within 10 miles	43	
11-30 miles	4	
31-100 miles	3	
101-500 miles	4	
Greater than 500 miles	3	
# of depressive symptoms	1.5 (2.0)	16,960
Clinical depression[a]	16	16,960
Time-varying variables		
Age	62.8 (10.7)	17,671
Partner[b]	67	17,658
Functional limitations[c]	15	17,596
Poor self-rated health[d]	28	17,661
Grandparent[e]	74	17,250
Employment[f]	48	17,547
Relative poverty[g]	11	17,603
Time-constant variables		
Female[h]	59	17,671
Race		17,621
White	73	
Nonwhite	27	

Note. Own calculations based on HRS, 2004-2018. SD = standard deviation.
[a]Clinical depression: 0 = no clinical depression, 1 = clinical depression. [b]Partner: 0 = no partner, 1 = partner. [c]Functional limitations: 0 = no functional limitations, 1 = functional limitations. [d]Self-rated health: 0 = good self-rated health, 1 = poor self-rated health. [e]Grandparent: 0 = no grandparent, 1 = grandparent. [f]Employment: 0 = unemployed, 1 = employed. [g]Relative poverty: 0 = above poverty threshold, 1 = below poverty threshold. [h]Female: 0 = male, 1 = female.

information, we calculated the geographic distance between parents and children using SAS. The precision of our measurements relies on the geographic location of both parents and children in relation to the centroid of a census tract or zip code area. Following Choi and colleagues (2015), we distinguished six mutually exclusive categories: (a) coresidence (that is, distance = 0), living (b) 1–10 miles (or in the same zip code area), (c) 11–30 miles, (d) 31–100 miles, (e) 101–500 miles, or (f) more than 500 miles apart from the closest living child. Note that a respondent might have multiple children living in the same geographic area. Based on these categories, we eventually constructed a quasimetric variable for our main analyses. Out of a total of 92,095 observations, information on intergenerational proximity was missing among 7,748 observations.

Moreover, we acknowledge that coresidence is likely to reflect more than simply "distance = 0" and "living in the same household and living next door [may] differ qualitatively because of their implications for cost and for privacy" (Compton & Pollak, 2015, p. 102). Therefore, we also ran models focusing on coresidence transitions, which was captured by a binary indicator that equals 1 if parents and at least one child coreside in the same household.

Depressive symptoms were measured using an abbreviated version of the CES-D scale provided by the HRS (Karim et al., 2015). The abbreviated version used in this analysis (CES-D 8) has been shown to be a valid and reliable instrument to measure depressive symptoms (Cronbach's alpha>0.80; Steffick, 2000). Respondents were asked whether, "Much of the time during the past week," they a) experienced feelings of depression, b) perceived everything they did as an effort, c) had restless sleep, d) felt happy, e) experienced loneliness, f) found enjoyment in life, g) felt sadness, or h) struggled to "get going". The respondents could indicate their response as either "yes" or "no". The CES-D score is derived by summing the total number of "yes" responses to questions a, b, c, e, g, and h and "no" responses to questions d and f, with higher values indicating more depressive symptoms (ranging from 0-8). Following previous studies, we classified respondents with four or more depressive symptoms to be above the clinical cutoff for depression (Zivin et al., 2010). Using a binary variable to indicate depressive symptoms above the clinical cutoff did not alter our main results.

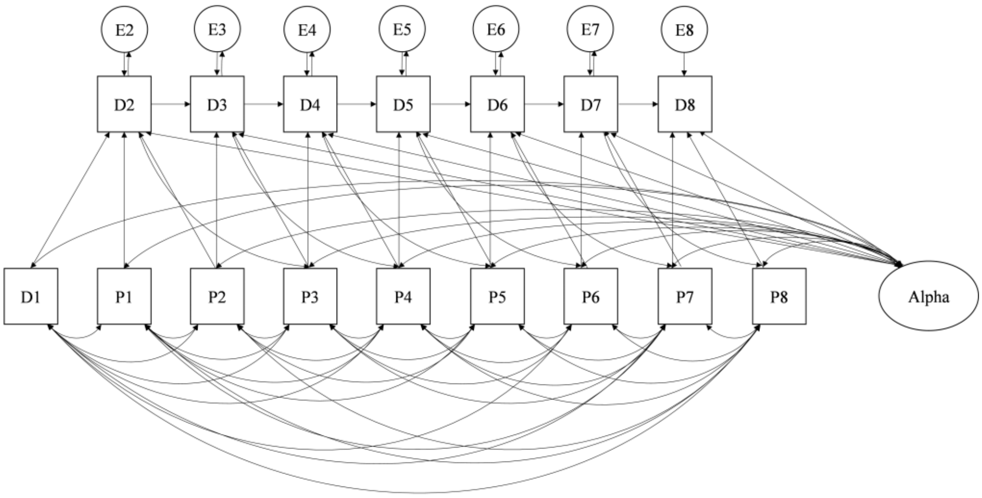
While dynamic panel models with fixed effects allow us to address methodological concerns that may have resulted in biased findings, the computational time needed to run the models increases with additional parameters, especially when using full information maximum likelihood (FIML) to handle missing values and maintain a full sample size. To ensure model convergence, we included simplified (mostly dichotomous) variables that may influence the bidirectional relationship between geographic proximity and parental depressive symptoms. We measured *age* using four categories (1≤64 years, 2=65 years to 74 years, 3=75 years to 84 years, 4=85+ years). The respondents' *relationship status* was assessed by a dichotomous variable indicating whether the respondents had a partner. *Functional limitations* were operationalized as a binary indicator, distinguishing between respondents with one or more activities of daily living (ADL) limitations, such as eating, bathing, or mobility, and those without such limitations. Respondents' *self-rated health* (SRH) was measured by contrasting respondents with "excellent", "very good", and "good" SRH (=1) with respondents with "fair" and "poor" SRH (=0). We included parental SES using a dichotomous variable that indicates whether a respondent's family income is below the *poverty* threshold. We drew on a generated variable from the RAND HRS, which is based on the poverty threshold levels from the U.S. Census Bureau and the compositions of respondents' families (household size). Further dichotomous variables identified *grandparents* and gainfully *employed* respondents.

3.5.3. Analytical approach

We identify the potential causal relationship between intergenerational proximity and older adults' depressive symptoms using dynamic panel models with fixed effects in a structural equation modeling context (ML-SEM). ML-SEM addresses two key challenges in establishing causal relationships in social science research: *reverse causality* and *omitted variable bias* (see Allison et al., 2017). Reverse causality occurs when it is unclear whether X causes Y or Y causes X, leading to biased results in models that do not account for this issue (Brüderl & Ludwig, 2014). Omitted variable bias occurs when unobserved variables affect both dependent and independent variables. ML-SEM accounts for time-invariant observed and, more importantly, unobserved confounders, that may alter the relationship between intergenerational proximity and parental depressive symptoms, such as personality traits (Koorevaar et al., 2013; Krause et al., 1990) or childhood experiences (Comijs et al., 2013). In ML-SEM, reverse causality is accounted for by allowing the time-varying independent variables and past error terms of the dependent variable to correlate. Time-invariant confounders are addressed by including unit-specific factors as a latent construct. In summary, ML-SEM combines traditional cross-lagged panel approaches with fixed effects approaches.

In ML-SEM, both intergenerational proximity and older adults' depressive symptoms are regressed on their own lagged values (*autoregressive effects*), as well as the other variable's cross-lagged values and the abovementioned time-varying controls. In our case, *cross-lagged effects* would indicate that depressive symptoms and intergenerational proximity may – at least partly – be predicted by the other variable's lagged values. Hence, the framework analyzes whether previous intergenerational proximity predicts older adults' current depressive symptoms (and vice versa), net of their own lagged values, time-varying controls, and unobserved time-invariant confounders. However, the results may be biased because the temporal lag between survey waves in the HRS may not accurately capture the temporal lag with which the association between intergenerational proximity and depressive symptoms unfolds. Therefore, following recommendations from a recent simulation study (Leszczensky & Wolbring, 2019), we also included the *contemporaneous effect* of the outcome in the models.

Figure 3-1. ML-SEM between depressive symptoms (DV) and geographic proximity (IV)



Note. D=Depressive Symptoms, P=Geographic Proximity.

Figure 3-1 displays how geographic proximity predicts parental depressive symptoms over time. As discussed, we included both the contemporaneous and cross-lagged effects of geographic proximity on depressive symptoms, as well as the autoregressive effect of depressive symptoms. The latent variable alpha accounts for time-invariant (unobserved) individual confounders.

A strength of using ML-SEM is that it is fitted within the structural equation modeling context, allowing for the utilization of full-information maximum likelihood (FIML) estimation to handle missing values across waves. Although FIML assumes that missing values are missing at random and normally distributed, it provides robust results even when the latter assumption is violated (Enders & Bandalos, 2001). Panel attrition presents another threat to unbiased results, particularly over an observation period of 14 years and with a sample of older respondents. Logistic regression suggested that younger, ‘White’, partnered women with better health, who had grandchildren and who did not live in poverty were more likely to remain in the sample. Both proximity and depressive symptoms were only marginally associated with attrition. The results were interpreted against this background.

To assess the goodness-of-fit of our models, we used the Tucker Lewis Index (TLI) > 0.95, the Comparative Fit Index (CFI) > 0.95, and the Root Mean Square Error of Approximation (RMSEA) < 0.06. These indices all indicated an excellent fit for our models. Replication files for the main analyses and robustness checks can be accessed online.

3.6. Results

3.6.1. Intergenerational proximity

Table 3-3 displays the results of the ML-SEM of depressive symptoms and intergenerational proximity for the full sample. For easier interpretation, cross-lagged and autoregressive coefficients are displayed in Figure 3-2. We observed autoregressive effects where (a) parents' previous number of depressive symptoms predicted changes in depression (b=0.12, p<0.001) and (b) previous intergenerational proximity predicted changes in intergenerational proximity (b=0.67, p<0.001). Moreover, a very small negative cross-lagged effect of depressive symptoms on proximity is evident (b=-0.01, p<0.05), suggesting that an increase in the number of depressive symptoms predicts a slight *increase* in intergenerational proximity.

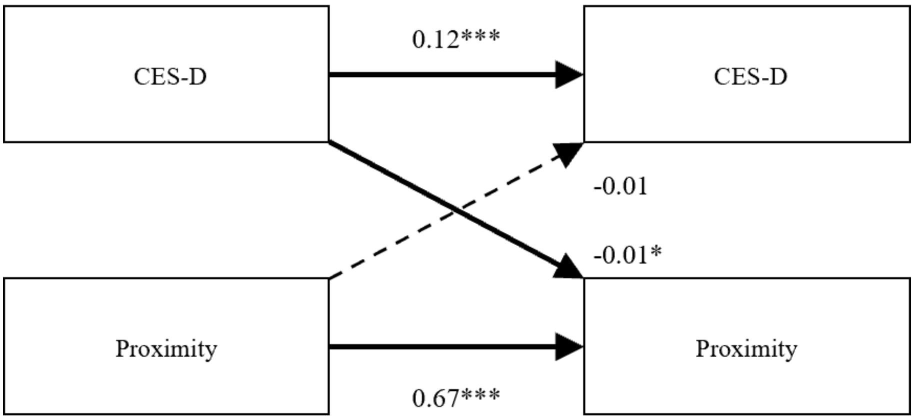
Separate regressions by parents' gender and by race/ethnicity did not reveal statistically significant cross-lagged effects for mothers or for 'White' or 'Nonwhite' respondents but did reveal a very small negative cross-lagged effect for fathers (b=-0.01, p<0.05), indicating that a greater number of depressive symptoms slightly increased the propensity for greater intergenerational proximity (Figure 3-3). Overall, the magnitude of the coefficient in both the full sample and the fathers suggests a very small change, meaning that even large changes in depressive symptoms would result in very small shifts in the proximity category. Tables A3-1 + A3-2 in the Appendix give a full display of the results.

Table 3-3. ML-SEM of depressive symptoms and intergenerational proximity

	Depressive symptoms	Proximity
	B/(SE)	*B/(SE)*
Autoregressive effect		
Depressive symptoms	0.12***	-
	(0.01)	-
Proximity	-	0.67***
	-	(0.01)
Cross-lagged effect		
Proximity	-0.01	-
	(0.01)	-
Depressive symptoms	-	-0.01*
	-	(0.00)
Contemporaneous effect		
Proximity	-0.03*	-
	(0.01)	-
Depressive symptoms	-	-0.01
	-	(0.00)
Time varying covariates		
Age	0.05**	-0.08***
	(0.02)	(0.01)
Partner status	-0.46***	0.05**
	(0.04)	(0.02)
Functional limitations	0.53***	-0.02*
	(0.03)	(0.01)
Self-rated health	0.53***	-0.03**
	(0.02)	(0.01)
Grandparenthood	-0.03	0.03
	(0.03)	(0.02)
Employment status	-0.15***	0.00
	(0.02)	(0.01)
Relative poverty	0.05	0.08***
	(0.02)	(0.01)
Goodness-of-fit		
RMSEA	0.01	0.01
CFI	0.99	0.99
TLI	0.98	0.99

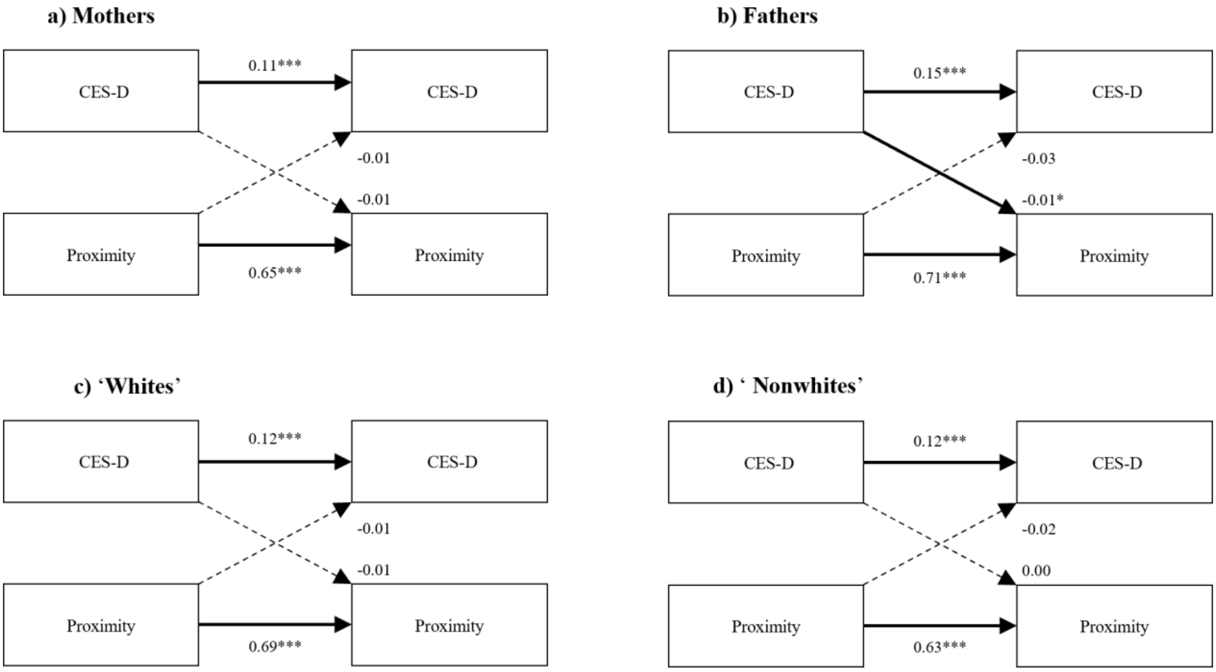
Note. Own calculations based on HRS waves 2004-2018; Unstandardized coefficients; Full-information maximum likelihood estimator applied; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; N=17,671.
*p<0.05, **p<0.01, ***p<0.001.

Figure 3-2. Unstandardized coefficients of bidirectional relations between depressive symptoms (CES-D) and intergenerational proximity (proximity)



Note. FIML estimator applied, covariates include age, partner status, functional limitations, self-rated health, grandparenthood, employment status and relative poverty. Significant paths: solid lines in black. Insignificant paths: dashed lines; N=17,671.
* p < .05; ** p < .01; *** p < .001.

Figure 3-3. Unstandardized coefficients of bidirectional relations between depressive symptoms (CES-D) and intergenerational proximity (proximity) for a) Mothers, b) Fathers, c) 'Whites' and d) 'Nonwhites'



Note. FIML estimator applied, covariates include age, partner status, functional limitations, self-rated health, grandparenthood, employment status and relative poverty. Significant paths: solid lines in black. Insignificant paths: dashed lines; Panel a) N=10,459; Panel b) N=7,212, Panel c) N= 12,832, Panel d) N=4,839.
* p < .05; ** p < .01; *** p < .001.

3.6.2. Intergenerational coresidence

Table 3-4 displays the results of the ML-SEM of depressive symptoms and intergenerational coresidence for the full sample. For easier interpretation, cross-lagged and autoregressive coefficients are displayed in Figure 3-4. When focusing on coresidence transitions, we also found evidence of autoregressive effects ($b=0.57$, $p<0.001$). In addition, a positive cross-lagged ($b=0.07$, $p<0.01$) and contemporaneous effect ($b=0.08$, $p<0.05$) of coresidence on parents' depressive symptoms was observed, suggesting that previous and current intergenerational coresidence *increased* the number of depressive symptoms. However, the reverse effect was not observed: the number of depressive symptoms did not affect coresidence transitions.

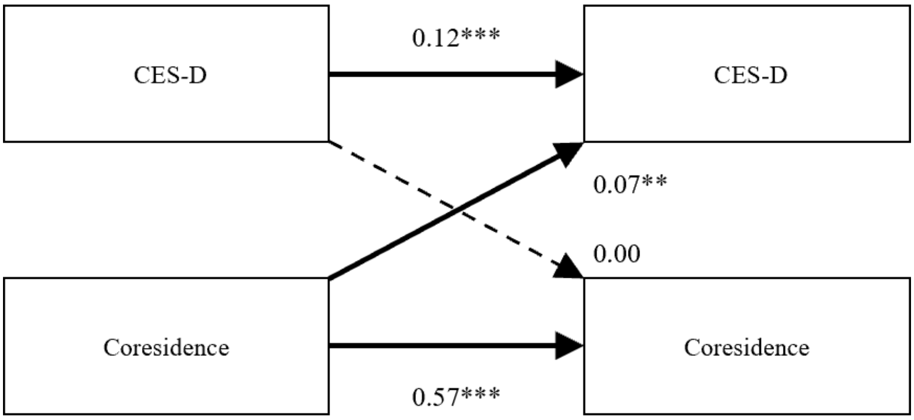
However, breaking down the sample by gender and race/ethnicity showed that coresidential transitions were harmful only for 'White' ($b=0.06$, $p<0.05$) respondents but not for 'Nonwhite' respondents. In addition, we observed a positive cross-lagged effect of intergenerational coresidence on depressive symptoms only for fathers ($b=0.10$, $p<0.05$) but not for mothers, as well as a very small positive effect of fathers' depressive symptoms on coresidential transitions ($b=0.01$, $p<0.05$; Figure 3-5). Again, the effect size of 0.01 indicates that depressive symptoms have an almost negligible impact on changes in fathers' coresidence. Moreover, although the effect sizes linking coresidence to depressive symptoms are relatively small (between 0.06 and 0.10) for the overall sample, fathers, and 'Whites', we consider this relationship to be intuitive and practically meaningful. Tables A3-3 + A3-4 in the Appendix give a full display of the results.

Table 3-4. ML-SEM of depressive symptoms and intergenerational coresidence

	Depressive symptoms	Coresidence
	B/(SE)	*B/(SE)*
Autoregressive effect		
Depressive symptoms	0.12***	-
	(0.01)	-
Coresidence	-	0.57***
	-	(0.01)
Cross-lagged effect		
Coresidence	0.07**	-
	(0.03)	-
Depressive symptoms	-	0.00
	-	(0.00)
Contemporaneous effect		
Coresidence	0.08*	-
	(0.04)	-
Depressive symptoms	-	0.00
	-	(0.00)
Time varying covariates		
Age	0.05**	0.03***
	(0.02)	(0.00)
Partner status	-0.46***	-0.03***
	(0.03)	(0.01)
Functional limitations	0.53***	0.01
	(0.02)	(0.00)
Self-rated health	0.53***	0.01*
	(0.02)	(0.00)
Grandparenthood	-0.01	-0.05***
	(0.03)	(0.01)
Employment status	-0.15***	0.00
	(0.02)	(0.00)
Relative poverty	0.05*	-0.06***
	(0.02)	(0.01)
Goodness-of-fit		
RMSEA	0.01	0.01
CFI	0.98	0.99
TLI	0.98	0.99

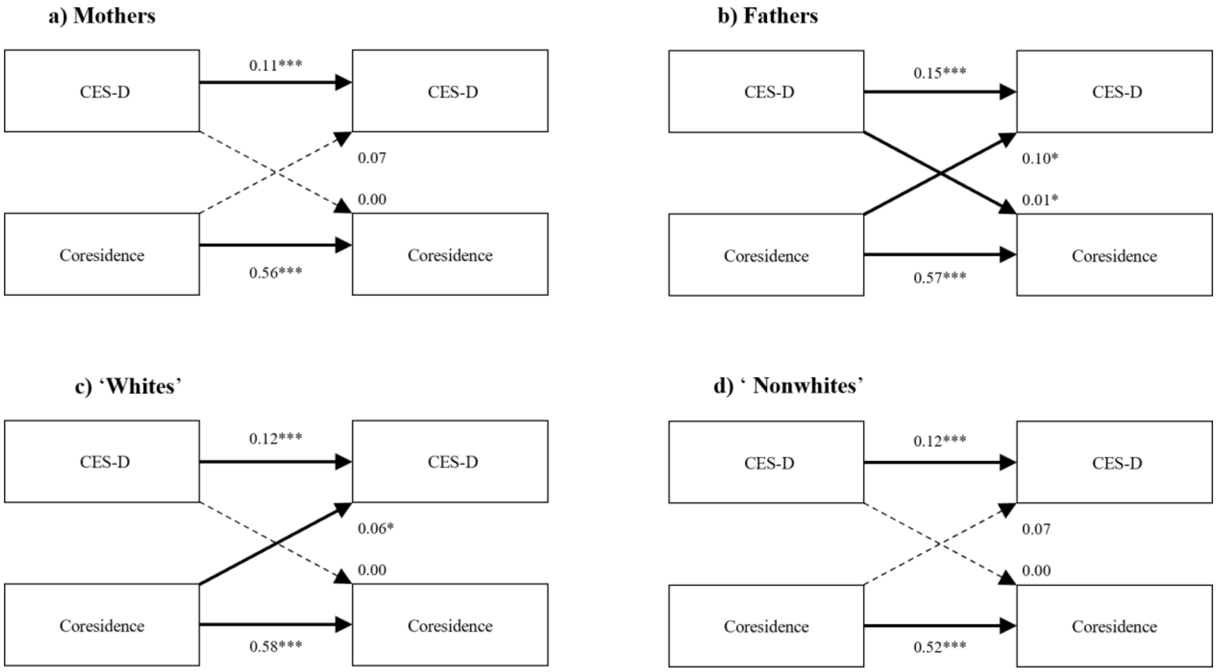
Note. Own calculations based on HRS waves 2004-2018; Unstandardized coefficients; Full-information maximum likelihood estimator applied; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; N=17,671.
*p<0.05, **p<0.01, ***p<0.001.

Figure 3-4. Unstandardized coefficients of bidirectional relations between depressive symptoms (CES-D) and intergenerational coresidence (coresidence)



Note. FIML estimator applied, covariates include age, partner status, functional limitations, self-rated health, grandparenthood, employment status and relative poverty. Significant paths: solid lines in black. Insignificant paths: dashed lines; N=17,671.
* p < .05; ** p < .01; *** p < .001.

Figure 3-5. Unstandardized coefficients of bidirectional relations between depressive symptoms (CES-D) and intergenerational coresidence (coresidence) for a) Mothers, b) Fathers, c) 'Whites' and d) 'Nonwhites'



Note. FIML estimator applied, covariates include age, partner status, functional limitations, self-rated health, grandparenthood, employment status and relative poverty. Significant paths: solid lines in black. Insignificant paths: dashed lines; Panel a) N=10,459; Panel b) N=7,212, Panel c) N= 12,832, Panel d) N=4,839.
* p < .05; ** p < .01; *** p < .001.

3.6.3. Robustness checks

To ensure the robustness of our results, we conducted two sensitivity analyses. *First*, acknowledging the nonstrictly continuous nature of the intergenerational proximity measure, we conducted supplementary analyses for a) respondents who lived close to a child (within 10 miles) and *diverged* geographically and b) respondents who did not live close to a child (more than 10 miles away) and *converged* geographically. The results of the supplementary analyses reinforce our argument that extending beyond the 10-mile threshold is crucial because no statistically significant associations were found in these sensitivity analyses, as opposed to our main analyses.

Second, changes in proximity may be driven by the relocation of either the parent or the adult child. To address this possibility, we reran our main analyses while focusing exclusively on relocations of the adult child because they typically move closer to the parent rather than the reverse (Reyes & Shang, 2023). Restricting our focus to changes in the children's locations did not alter the main patterns observed (detailed regression results available upon request).

3.7. Discussion

Although previous research has indicated the effects of intergenerational proximity (including coresidence) on older parents' mental health and vice versa, the potential bidirectionality of the proximity-health nexus remains understudied. Using eight waves of the Health and Retirement Study (collected between 2004 and 2018), the present study aimed to address this neglected issue by applying dynamic panel models with fixed effects in a structural equation modeling context. This methodological approach appropriately accounts for reverse causality, produces unbiased results, and avoids spurious conclusions regarding the interplay between intergenerational social support and older adults' well-being (Jessee, 2023).

Our analysis *first* identified autoregressive effects indicating path dependencies across the life course: previous proximity affected current intergenerational proximity, and previous depressive symptoms affected parents' current number of depressive symptoms. *Second*, we found evidence for a very small cross-lagged effect of parents' depressive symptoms on intergenerational proximity (supporting the notion of a '*mobilization mechanism*'), but no reciprocal effect that would indicate an impact of parents' depressive symptoms on proximity. Breaking down our sample by gender revealed that the cross-lagged effect of parental depressive symptoms on proximity observed in the full sample is primarily driven by *fathers*. This finding is consistent with that of Artamonova and colleagues (2020), who found that fathers' severe health problems significantly increased the likelihood of moving closer to a distant child. However, the cross-lagged effects of parents' (specifically fathers') depression on proximity are so small that they are substantively almost negligible (despite their statistical significance). We did not find any significant effects across racial/ethnic lines.

Third, when focusing on coresidence transitions, we found clear evidence supporting the notion of a '*social breakdown mechanism*'. Our results point to a negative effect of coresidence on parents' mental health, but not vice versa. Because many contemporary coresidence transitions in the U.S. appear to result from struggling adult children who return to the parental nest (Caputo, 2019; Caputo & Cagney, 2023) rather than from older parents who seek support from their children, coresident parents should be more likely to suffer from their adult children's emotional and material demands (Tosi & Grundy, 2018) than from an excessive receipt of support (Silverstein et al., 1996). This hypothesis seems especially true when adult children bring their own child or children (their parents' grandchildren) to live with their aging parents (Caputo & Cagney, 2023).

Fourth, our analysis of coresidential transitions by race/ethnicity and gender revealed that the results for the full sample appear to be primarily driven by 'Whites' and fathers. These findings are consistent with those of Caputo & Cagney (2023), who found that parent-child coresidence was associated with greater depression among 'White' parents. Coresidential transitions may not be detrimental to 'Nonwhite' parents because close proximity (including coresidence) is considered an important aspect of intergenerational solidarity (Reyes et al., 2020), reflecting more familialistic beliefs (Cepa & Kao, 2019). In turn, 'White' parents may have stronger opinions about independent and autonomous living in older age (Cepa & Kao, 2019). In addition, the return of adult children to the parental home may be more harmful for fathers than for mothers because fathers may then receive less support from their wives (who are likely to devote more time to their returned child) and might generally find adjusting to the rearranged living situation more challenging.

In sum, our analysis provided some weak evidence of a 'mobilization effect' (that is, parents', especially fathers', depression triggering greater proximity, including coresidence) and somewhat clearer evidence for a 'social breakdown effect' of coresidential transitions on parents' depressive symptoms (particularly among 'Whites' and fathers). We found no evidence to support the notion of a 'social support mechanism' (predicting that greater proximity or the transition to coresidence would decrease the number of parents' depressive symptoms).

Our study has several *limitations*. First, despite our fixed effects approach accounting for time-invariant characteristics, we might still miss heterogeneities in the proximity-health nexus that depend on factors such as whether older parents live closest to or with a son or a daughter (for related studies on the provision of care see Grigoryeva, 2017; Patterson et al., 2022), as well as the quality of parent-child relationships (Patterson & Margolis, 2023). Moreover, the dynamics of intergenerational support are important to consider. These dynamics may involve changes in proximity driven by children who were previously living farther away but who moved closer to provide support. These changes might not be apparent in our data if a parent already had a child living nearby before the move. Future research could benefit from qualitative studies, which may uncover dynamics and heterogeneities that are not apparent in survey data.

Second, the impact of changes in intergenerational proximity - such as moving in with or closer to each other - on parents' mental health may depend on whose needs are being addressed (Smits et al., 2010): those of children who are struggling or those of frail parents. The adverse effects of intergenerational proximity (and coresidence) may also depend on other circumstances, such as attitudes toward multigenerational households or other stressors. Unfortunately, the HRS lacks detailed information to fully explain *why* close proximity and coresidence appear to be particularly challenging for certain groups, such as fathers and 'Whites'. This highlights the need for future research using longitudinal data with more detailed information on moving decisions to explore these dynamics in greater depth. In the case of coresidence, however, we assume that transitions in the contemporary U.S. are more likely to be triggered by the needs of adult children and their return to the parental nest a situation that can negatively impact parents' mental health, especially after a prolonged period of independent living and when the returning child is unemployed (Caputo, 2019; also see Tosi & Grundy, 2018).

Third, driven by data constraints in the HRS, we focus on intergenerational proximity and parents' depressive symptoms across a temporal lag of 2 years. Within this period, the potentially opposing effects of intergenerational proximity on parents' depressive symptoms may either balance each other out or interfere with other life events. Gaining information on shorter temporal lags would provide a deeper understanding of more immediate and short-term consequences of these dynamics.

Despite these limitations, our study offers important and novel insights into the relationship between adult intergenerational residential proximity and older parents' mental health. Taking a bidirectional approach challenges previous studies' conclusions regarding the interplay between intergenerational social support and older adults' well-being (also see Jessee, 2023). Any identified clear causal effects suggest noxious effects of greater proximity (specifically coresidence) on parents' depressive symptoms, pointing toward 'social breakdown' rather than 'social support'. Thus, researchers and practitioners alike should acknowledge not only the potential benefits of close intergenerational relationships but also their potential harms.

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3.9. Acknowledgements

This study uses data from the Health and Retirement Study. The Health and Retirement Study is sponsored by the National Institute on Aging (grant NIA U01AG009740) and is conducted by the Institute for Social Research at the University of Michigan.

3.10. Appendix

Table A3-1. ML-SEM of depressive symptoms and intergenerational proximity, by parents' gender

	Mothers		Fathers	
	Depressive symptoms	Proximity	Depressive symptoms	Proximity
	B/(SE)	*B/(SE)*	*B/(SE)*	*B/(SE)*
Autoregressive effect				
Depressive symptoms	0.11***	-	0.15***	-
	(0.01)	-	(0.01)	-
Proximity	-	0.65***	-	0.71***
	-	(0.01)	-	(0.01)
Cross-lagged effect				
Proximity	-0.01	-	-0.03	-
	(0.01)	-	(0.01)	-
Depressive symptoms	-	-0.01	-	-0.01*
	-	(0.00)	-	(0.01)
Contemporaneous effect				
Proximity	-0.03	-	-0.04*	-
	(0.02)	-	(0.02)	-
Depressive symptoms	-	-0.01	-	0.00
	-	(0.01)	-	(0.01)
Time-varying control				
Age	0.07**	-0.07***	0.02	-0.08***
	(0.03)	(0.01)	(0.03)	(0.02)
Partner	-0.40***	0.10***	-0.59***	-0.05
	(0.04)	(0.02)	(0.04)	(0.03)
Functional limitations	0.51***	-0.01	0.56***	-0.04*
	(0.03)	(0.01)	(0.03)	(0.02)
Self-rated health	0.59***	-0.04*	0.44***	-0.02
	(0.02)	(0.01)	(0.03)	(0.02)
Grandparent	-0.02	0.06*	-0.03	0.01
	(0.04)	(0.02)	(0.04)	(0.03)
Employment	-0.15***	0.01	-0.15***	0.00
	(0.03)	(0.02)	(0.03)	(0.02)
Relative Poverty	0.07*	0.08***	0.01	0.08**
	(0.03)	(0.02)	(0.04)	(0.03)
Goodness-of-fit				
RMSEA	0.01	0.01	0.01	0.02
CFI	0.98	0.99	0.98	0.98
TLI	0.98	0.99	0.97	0.97
N	10,459		7,212	

Note. Own Calculations based on HRS waves 2004-2018; Unstandardized coefficients; Full-information maximum likelihood estimator applied; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index.
*p<0.05, **p<0.01, ***p<0.001

Table A3-2. ML-SEM of depressive symptoms and intergenerational proximity, by parents' race/ethnicity

	White		Non-White	
	Depressive symptoms	Proximity	Depressive symptoms	Proximity
	B/(SE)	*B/(SE)*	*B/(SE)*	*B/(SE)*
Autoregressive effect				
Depressive symptoms	0.12***	-	0.12***	-
	(0.01)	-	(0.01)	-
Proximity	-	0.69***	-	0.63***
	-	(0.01)	-	(0.02)
Cross-lagged effect				
Proximity	-0.01	-	-0.02	-
	(0.01)	-	(0.02)	-
Depressive symptoms	-	-0.01	-	0.00
	-	(0.00)	-	(0.01)
Contemporaneous effect				
Proximity	-0.03*	-	0.01	-
	(0.02)	-	(0.04)	-
Depressive symptoms	-	-0.01*	-	0.01
	-	(0.01)	-	(0.01)
Time-varying control				
Age	0.04*	-0.07***	0.06	-0.09***
	(0.02)	(0.01)	(0.04)	(0.02)
Partner	-0.49***	0.05*	-0.32***	0.04
	(0.03)	(0.02)	(0.07)	(0.04)
Functional limitations	0.49***	-0.03*	0.64***	0.00
	(0.02)	(0.01)	(0.04)	(0.02)
Self-rated health	0.58***	-0.04**	0.40***	-0.01
	(0.02)	(0.01)	(0.04)	(0.02)
Grandparent	-0.03	0.04	-0.04	0.03
	(0.03)	(0.02)	(0.07)	(0.04)
Employment	-0.15***	0.01	-0.17***	0.00
	(0.02)	(0.01)	(0.04)	(0.02)
Relative Poverty	0.05	0.08***	0.05	0.08***
	(0.03)	(0.02)	(0.04)	(0.02)
Goodness-of-fit				
RMSEA	0.01	0.01	0.01	0.01
CFI	0.98	0.99	0.98	0.98
TLI	0.98	0.98	0.98	0.97
N	12,832		4,839	

Note. Own Calculations based on HRS waves 2004-2018; Unstandardized coefficients; Full-information maximum likelihood estimator applied; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index.
*p<0.05, **p<0.01, ***p<0.001

Table A3-3. ML-SEM of depressive symptoms and intergenerational coresidence, by parents' gender

	Mothers		Fathers	
	Depressive symptoms	Coresidence	Depressive symptoms	Coresidence
	B/(SE)	*B/(SE)*	*B/(SE)*	*B/(SE)*
Autoregressive effect				
Depressive symptoms	0.11***	-	0.15***	-
	(0.01)	-	(0.01)	-
Coresidence	-	0.56***	-	0.57***
	-	(0.01)	-	(0.01)
Cross-lagged effect				
Coresidence	0.07	-	0.10*	-
	(0.03)	-	(0.04)	-
Depressive symptoms	-	0.00	-	0.01*
	-	(0.00)	-	(0.00)
Contemporaneous effect				
Coresidence	0.10*	-	0.06	-
	(0.05)	-	(0.05)	-
Depressive symptoms	-	0.00	-	0.00
	-	(0.00)	-	(0.00)
Time-varying control				
Age	0.06*	0.03***	0.02	0.02***
	(0.03)	(0.01)	(0.03)	(0.01)
Partner	-0.39***	-0.04***	-0.59***	0.00
	(0.04)	(0.01)	(0.04)	(0.01)
Functional limitations	0.51***	0.00	0.57***	0.02*
	(0.03)	(0.01)	(0.03)	(0.01)
Self-rated health	0.58***	0.01	0.44***	0.01
	(0.02)	(0.01)	(0.03)	(0.01)
Grandparent	0.00	-0.05***	-0.03	-0.04***
	(0.04)	(0.01)	(0.04)	(0.01)
Employment	-0.15***	0.00	-0.15***	0.00
	(0.03)	(0.01)	(0.03)	(0.01)
Relative Poverty	0.08*	-0.06***	0.01	-0.06***
	(0.03)	(0.01)	(0.04)	(0.01)
Goodness-of-fit				
RMSEA	0.01	0.01	0.01	0.01
CFI	0.98	0.99	0.98	0.99
TLI	0.98	0.99	0.97	0.99
N	10,459		7,212	

Note. Own Calculations based on HRS waves 2004-2018; Unstandardized coefficients; Full-information maximum likelihood estimator applied; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index.
*p<0.05, **p<0.01, ***p<0.001.

Table A3-4. ML-SEM of depressive symptoms and intergenerational coresidence, by parents' race/ethnicity

	White		Non-White	
	Depressive symptoms	Coresidence	Depressive symptoms	Coresidence
	B/(SE)	*B/(SE)*	*B/(SE)*	*B/(SE)*
Autoregressive effect				
Depressive symptoms	0.12***	-	0.12***	-
	(0.01)	-	(0.01)	-
Coresidence	-	0.58***	-	0.52***
	-	(0.01)	-	(0.01)
Cross-lagged effect				
Coresidence	0.06*	-	0.07	-
	(0.03)	-	(0.05)	-
Depressive symptoms	-	0.00	-	0.00
	-	(0.00)	-	(0.00)
Contemporaneous effect				
Coresidence	0.11**	-	-0.07	-
	(0.04)	-	(0.07)	-
Depressive symptoms	-	0.00*	-	-0.01*
	-	(0.00)	-	(0.00)
Time-varying control				
Age	0.04*	0.03***	0.06	0.03**
	(0.02)	(0.00)	(0.04)	(0.01)
Partner	-0.49***	-0.04***	-0.32***	-0.01
	(0.03)	(0.01)	(0.07)	(0.02)
Functional limitations	0.49***	0.01	0.64***	0.01
	(0.02)	(0.01)	(0.04)	(0.01)
Self-rated health	0.58***	0.01**	0.40***	0.00
	(0.02)	(0.00)	(0.04)	(0.01)
Grandparent	-0.02	-0.05***	-0.04	-0.04*
	(0.03)	(0.01)	(0.07)	(0.01)
Employment	-0.15***	0.00	-0.17***	0.00
	(0.02)	(0.01)	(0.04)	(0.01)
Relative Poverty	0.05	-0.05***	0.05	-0.06***
	(0.03)	(0.01)	(0.04)	(0.01)
Goodness-of-fit				
RMSEA	0.01	0.01	0.01	0.01
CFI	0.98	0.99	0.98	0.99
TLI	0.98	0.99	0.98	0.98
N	12,832		4,839	

Note. Own Calculations based on HRS waves 2004-2018; Unstandardized coefficients; Full-information maximum likelihood estimator applied; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index.
*p<0.05, **p<0.01, ***p<0.001.

Chapter 4

Parent-Child Disconnectedness and Older European Adults' Mental Health: Do Patterns Differ by Marital Status and Gender?

Lisa Jessee & Deborah Carr

Abstract

Objective. Disconnectedness from one's adult child(ren) can undermine older adults' well-being. However, the psychological consequences of disconnectedness may differ across marital contexts and by gender. Drawing on stress and normative violation frameworks, we examine the association between parent-child disconnectedness and European older adults' depressive symptoms, and the extent to which these patterns differ by marital status (married; remarried; cohabiting; divorced; widowed; and never married) and gender.

Methods. We used pooled data from eight waves (2004-2022) of the Survey of Health and Retirement in Europe (SHARE, n=216,469) and multivariable pooled OLS regression to evaluate whether marital status and gender moderate the association between disconnectedness and depressive symptoms. Analyses were adjusted for socioeconomic, health, survey year, and contextual covariates.

Results. Rates of disconnectedness range from 1 percent among older adults in their first marriages to 13-14 percent among divorced and remarried men and 17 percent among never married men. Men have consistently higher rates of disconnectedness than women. Parent-child disconnectedness is associated with heightened depressive symptoms in nearly all marital and gender categories. Moderation analyses show the strongest associations in marital contexts in which disconnectedness is rare (first marriage, especially among women). Disconnectedness also is associated with heightened depressive symptoms among widowed and divorced persons, yet has negligible effects among remarried persons.

Discussion. We discuss the implications of disconnectedness for older adults' socioemotional and caregiving needs. We encourage interventions that focus on engaging older adults' protective familial or non-familial ties rather than re-establishing potentially distressing ties with a disconnected child.

4.1. Introduction

Intergenerational ties are critical to older adults' well-being. Parent-child relationships marked by warmth, frequent and desired contact, and socioemotional support bolster older adults' (mental) health (Carr & Utz, 2020; Fingerman et al., 2020). Conversely, relationships marked by infrequent contact, conflict, and strain undermine older adults' well-being. Tenuous relationships are considered more consequential than strong relations because problematic ties are atypical, stigmatized, and emotionally painful (e.g., Rook, 2015). One particular relationship attribute has recently been identified as a potentially important influence on older adults' mental health: *parent-child disconnectedness* (Kalmijn, 2023; Lin et al., 2024; Reczek et al., 2024). Disconnectedness refers to a parent's lack of contact with at least one child (Lin et al., 2024; Reczek et al., 2023). Parent-child disconnectedness is rare in the U.S., though more common among fathers than mothers; estimates range from 1 to 20 percent depending on sample and methodology (see Reczek et al., 2023 for review).

Disconnected parents may be deprived of practical and emotional support needed to manage aging-related challenges including retirement, spousal caregiving, health problems, and deaths of significant others (Charles & Carstensen, 2010). However, the extent to which disconnectedness affects older adults' well-being may *vary across marital statuses and by gender*. For older parents who never married or whose marriages ended due to spousal death or divorce, disconnectedness may be particularly harmful, as adult children are typically their main source of support (Swartz, 2009). The psychological impact of disconnectedness also may be severe for those in their first and only marriage, because disconnected ties are rarer and less expected in stable partnerships (Pillemer, 2020). Parent-child ties also vary by gender; mothers tend to have stronger bonds and more frequent contact with their children relative to fathers and may experience greater stigmatization or self-blame when disconnected from them (Fingerman et al., 2020). However, we are unaware of studies exploring the prevalence and psychological consequences of disconnectedness on the basis of marital status and gender, especially in the European context where older adults' family lives differ from U.S. adults with respect to structure, contact, and closeness.

Against this background, we use data from the Survey of Health and Retirement in Europe (SHARE), a multiwave survey of older adults in 27 European nations, to document: (1) the prevalence of parent-child disconnectedness among European older adults, with attention to marital status (married; remarried; cohabiting; divorced; widowed; and never married) and gender differences therein; and (2) the extent to which the association between disconnectedness and depressive symptoms is moderated by marital status and gender.

4.2. Background

4.2.1. Parent-child disconnectedness and parental well-being

The intergenerational resource framework suggests that parent-child disconnectedness may undermine both generations' mental health by depriving them of protective and supportive resources (Reczek et al., 2024). Psychological writings on ambiguous loss further suggest that disconnected ties are distressing because neither party has closure or certainty regarding the lost tie. Disconnectedness can even elicit grief-life symptoms because it involves "physical absence with psychological presence" (Boss, 1999). The impacts of disconnectedness for adult children are well-established (Hank, 2024; Hartnett et al., 2018), yet few studies have focused on the parent's perspective. Reczek and colleagues (2024) examined parent-child estrangement, which encompasses both disconnectedness (i.e., lack of contact) and perceived emotional closeness. Estranged midlife mothers reported poorer physical health than their peers with strong ties to their child(ren). Two studies, one in the U.S. and one in the Netherlands, found that disconnected divorced parents reported poorer mental health than their counterparts connected to all of their children (Kalmijn, 2023; Lin et al., 2024)

Important questions remain unresolved about the nature and impact of parent-child disconnectedness for older adults. Despite the increasing complexity of older adults' marital histories in Europe and the U.S. in the 21st century (Carr & Utz, 2020), surprisingly little is known about *marital status variations* in parent-child disconnectedness. One U.S. study of parent-child estrangement, measured as disconnected and low levels of perceived emotional closeness, found that married mothers are about half as likely to report estrangement as widowed or divorced mothers. However, this study focused on mothers only and did not include other marital categories that are increasingly prevalent among older adults (Gilligan et al., 2015). Other studies on the patterning and mental health impacts of disconnectedness have focused solely on divorced older adults in the U.S. (Lin et al., 2024) and the Netherlands (Kalmijn, 2023) or did not compare parents on the basis of marital status (Reczek et al., 2023, 2024).

Marital Status and Disconnectedness. Family systems approaches emphasize the interconnectedness of family members' experiences, such that one strained or disrupted relationship may give rise to other problematic interactions (Arránz Becker & Hank, 2022). For instance, a divorce may threaten the quality of parent-child relationships, especially if an adult child blames their parent for the divorce. Parents' marital transitions can destabilize parent-child relations, making disconnectedness more common for divorced, widowed, or repartnered parents relative to parents with an enduring union (Zarit et al., 2005). Married parents with high marital quality, by contrast, tend to enjoy more harmonious and stable parent-child relationships (Coleman, 2020; Pillemer, 2020).

Stress process frameworks propose that the mental health consequences of a potentially distressing experience, such as disconnectedness, may vary on the basis of personal and contextual factors (Pearlin et al., 2005). Coping resources such as social support from a spouse, concomitant stressors that may further erode mental health like marital dissolution, and sociocultural contexts that shape the meaning, normativeness, or expectedness of a stressor may condition the impact of a stressful experience on older adults' mental health (Pearlin et al., 2005). Consistent with this framework, disconnectedness may be particularly distressing to older adults, who lack a spouse or cohabiting partner. Unpartnered disconnected parents may be especially vulnerable to mental health symptoms, as they are deprived of practical or emotional support from both a romantic partner and a child (Lin et al., 2024). The stress of parent-child disconnectedness also may compound economic and psychosocial strains experienced by persons who lost a spouse through widowhood or divorce, creating an emotional "double burden".

Married persons in their first union who are disconnected from a child also may experience significant depressive symptoms, because weakened intergenerational ties are less common and expected for them (Pillemer, 2020). Older parents in stable marriages may attribute the disconnectedness to their perceived failings as a parent, in absence of an external force like divorce or repartnering (Ryff et al., 1994). They also may experience stigmatization or judgment from other family members and friends, given the non-normativeness of disconnected ties between married parents and their children (e.g., Rook, 2015). Thus, we evaluate whether the psychological consequences of disconnectedness are exacerbated in marital contexts in which the older parent lacks spousal support (i.e., double burden) as well as in contexts in which disconnectedness is rare and considered a violation of cultural norms and expectations.

Gender and Disconnectedness. Cultural expectations for parenthood vary on the basis of gender, thus violations of parenting norms may have gendered mental health consequences. Current cohorts of older women were socialized to nurture and prioritize interpersonal relationships, especially parenthood (Stockard, 2006). Empirical studies consistently show that mothers report higher quality relationships, more emotional closeness, and more frequent contact with their adult children than do fathers (Fingerman et al., 2020). These gender gaps widen even further upon marital dissolution such that divorced men have less frequent contact and poorer quality relationships with their children than do divorced women, with these ties fraying further upon father's remarriage or establishment of a new cohabiting union (Kalmijn, 2007; Noël-Miller, 2013).

Widowed mothers also report more frequent emotional and social support from their children than do fathers, especially widowed fathers who have since repartnered (Jiao et al., 2021; Kalmijn, 2007; Van den Hoonaard, 2010). Given the strength and persistence of mother-child bonds and cultural expectations regarding motherhood, a disruption of this tie may be particularly distressing for women. Parent-child disconnectedness may threaten a core dimension of a mother's identity (Agllias, 2013), especially among women who feel shame or responsibility for their child's problems that potentially triggered the disconnectedness (Ryff et al., 1994). Thus, we expect that disconnectedness will be less common for women than men, across all marital categories, with the largest disparity among divorced and widowed parents. We also expect disconnectedness to be more distressing for women than men across all marital categories.

4.2.2. The present study

Our study offers two novel contributions to the emerging literature on parent-child disconnectedness and its implications for older adults' well-being. First, our study is the first we know of to document both the *prevalence of parent-child disconnectedness* and *its associations with mental health across marital statuses*, as well as *gender differences* therein. Understanding the patterning and consequences of parent-child disconnectedness across older adults' marital statuses is a critical concern. Given increasing rates of lifelong singlehood, "gray divorce" (i.e., divorce among persons aged 50 and older) in the U.S., or "silver splits" (i.e., dissolution of marriages or cohabiting unions among older adults) in Europe, and repartnering upon marital dissolution in recent decades, rising numbers of older adults are experiencing their later years outside of the "one marriage for life" model (Alderotti et al., 2022; Carr & Utz, 2020; United Nations, 2019). Global attention to social isolation among older adults and the implications for their health, well-being, and caregiving needs has focused largely on persons who lack blood or legal ties, such as “kinless” older adults who are unmarried and childless, neglecting experiences of adults who have children yet are disconnected from them (Patterson & Margolis, 2023; World Health Organization, 2021). With declining fertility rates and increasingly complex marital histories across Europe, disconnectedness could emerge as an urgent social concern that is not fully understood. Disconnected parents may have few other sources of support, especially those parents who have never married or whose marriages ended through death or divorce (Billari & Kohler, 2004).

Second, our study focuses on *European older adults*. Most research on parent-child disconnectedness is focused on the U.S. (Coleman, 2020; Pillemer, 2020). However, there may be regional differences in the normativeness of intergenerational strain which would condition its emotional impacts. Cross-cultural research documents that parent-child relationships in Europe are less likely to be disharmonious (low affection and high conflict) or detached (low affection and low conflict), compared to the U.S. – a difference attributed to “individualistic ideology with respect to kinship ties” in the U.S. (Silverstein et al., 2010, p. 1017). Marriage, divorce, and cohabitation rates among older adults differ between the U.S. and Europe, potentially affecting the prevalence and psychological impact of parent-child disconnectedness. Rates of gray divorce and silver splits have increased in both regions over the past three decades (Alderotti et al., 2022; Brown & Lin, 2022), yet divorce rates remain higher in the U.S. than in Europe (Eurostat, 2024; National Center for Health Statistics, 2023). In societies where divorce is less normative, parent-child disconnectedness may be more prevalent among divorced persons, as children might blame their parents (especially fathers) for the dissolution and sever contact (Schmidt et al., 2016). Additionally, in Europe, cohabitation is more prevalent and accepted, and is viewed as an alternative to marriage, whereas in the U.S., it is typically seen as an alternative to singlehood (Heuveline & Timberlake, 2004). Consequently, cohabiters in the U.S. may be more likely to experience parent-child disconnectedness than those in Europe, where cohabitation is better understood and accepted.

Our study focuses on Europe, a demographic and cultural context distinct from the U.S. context where disconnectedness has been previously studied (Lin et al., 2024; Reczek et al., 2024). We recognize, however, that family relationships vary *within* Europe in ways that may affect levels and impacts of disconnectedness. Intergenerational ties are generally stronger in Southern Europe compared to Northern Europe (Hank, 2007), while cohabitation and divorce are less common in the South (Mortelmans, 2020). Our study does not explore these regional difference in depth, and rather sets the foundation for future studies focused on within-Europe heterogeneity in disconnectedness.

In sum, our research contributes to the study of family diversity by examining: (1) the prevalence of parent-child disconnectedness among older European adults, stratified by gender and marital status; and (2) the extent to which associations between parent-child disconnectedness and depressive symptoms vary on the basis of gender and marital status.

4.3. Methods

4.3.1. Data

We use pooled data from waves 1, 2, 4, 5, 6, 7, 8, and 9 of the Survey of Health, Ageing and Retirement in Europe (SHARE, Börsch-Supan et al., 2013) from 2004 to 2022. SHARE is a cross-national survey modeled after the U.S.-based Health and Retirement Study (HRS). Compared to other European surveys, SHARE data pooled across multiple survey waves provides a large enough sample to evaluate parent-child disconnectedness across different marital statuses, including the relatively smaller categories of remarried, cohabiting and never married, stratified by gender.

We include all available individual observations across waves to ensure robust analysis and sufficient statistical power. Therefore, our initial pooled sample included 396,713 person-wave observations from 152,345 individuals from 28 countries, encompassing Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and Switzerland. We excluded respondents from Israel, the only country outside of Europe (N=11,693). We also excluded persons under age 50 (N=6,693) and childless respondents (N=35,898), given our focus on older parents who are disconnected from their child(ren). We also excluded observations from respondents with missing data on our focal variables (N=125,960, see Supplemental Table A4-1 for distribution of item-specific missing data). Our final sample included 82,687 respondents with 216,469 observations (i.e., an average of 2.6 observations per respondent).

4.3.2. Measures

Depressive symptoms. Depressive symptoms were assessed with the 12-item Euro-D scale (Prince et al., 1999). Respondents indicate the presence or absence of 12 symptoms in the past month (depressed mood, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, and tearfulness). Summed scores range from 0 to 12. Using a dichotomous indicator based on the cut-off for elevated depression (4+ depressive symptoms) yielded similar results.

Parent-child disconnectedness. Parent-child disconnectedness was defined as the lack of contact with at least one child in the past 12 months. The emphasis on disconnectedness from *at least one child* is consistent with research documenting that parental well-being is undermined if even one child has problems or relationship strains with the parent (Fingerman et al., 2012). SHARE asked respondents: “During the past twelve months, how often did you have contact with your child, either in person, by phone, or by mail?” Responses options were daily, several times a week, about once a week, about every two weeks, about once a month, less than once a month, and never. Respondents who said that they “never” had contact in the past year are coded as “disconnected,” consistent with prior studies (Lin et al., 2024).

Of those who were classified as disconnected, just 20 percent were disconnected from all children while 80 percent maintained contact with at least one other child. To ensure adequate statistical power for our moderation analyses, we did not stratify disconnected parents further in our multivariable analyses. However, supplemental bivariate analyses showed that parents disconnected from all of their children experienced significantly more depressive symptoms, with the most sizeable disparities among cohabiting and widowed women, as well as divorced and widowed men, suggesting an important direction for future research.

The parent-child contact question had quite high levels of missing data (20%). To address the possibility that missing responses might be indicative of a problematic or estranged relationship that respondents are reluctant to report, we compared depressive symptoms of respondents with missing data to both connected and disconnected parents. Respondents who did not report parent-child contact frequency have significantly *fewer* depressive symptoms than disconnected parents, and symptom levels similar to connected parents. We find comparable patterns across marital status categories for men and women. Therefore, we are confident that omitting persons with missing contact data will not bias our results for disconnected parents (see Supplemental Table A4-2).

Marital status. Our focal moderator is marital status (married, first marriage; married, second or higher order marriage; cohabiting or registered partnership; divorced; widowed; and never married). We do not differentiate divorced or widowed persons by number of prior marriages, to ensure adequately powered analyses. SHARE has considerable missing data (19% of full sample) on marital history because complete histories were captured at only two waves (3 and 7, SHARELIFE). Thus, although we can ascertain *current* marital status for all respondents, we can distinguish marital order only for those who participated in waves 3 and 7.

In supplemental analyses (available from authors), we compared depressive symptoms scores of those with missing versus more detailed marital histories. We detected no statistically significant differences in depressive symptoms scores between those in a first marriage, second or higher order marriage, or with missing marital history data. Among persons with missing marital history data, the depressive symptoms gap between connected and disconnected parents was comparable to that found among persons with complete marital history data. Thus, given the theoretical and substantive importance of considering repartnered persons, we limit our analyses to persons with marital history data.

Control variables. Demographics include *age at interview* (in years) *gender* (female=1, male=0), *household size,* and *total number of living children*. Socioeconomic status encompasses highest *educational degree* based on the ISCED-97 classification. We classify respondents as “low” (completed lower secondary education or less), “medium” (completed upper secondary or postsecondary non-tertiary education,) and “high” (completed the first stage of tertiary education or higher). We also adjust for current *employment* (yes=1, no=0) and *relative poverty status* (1 = poor), based on one’s total annual household income, adjusted for household size using the OECD equivalence scale. An individual is coded as at risk of relative poverty if their household’s equivalence-weighted net income was less than 60% of the country-wave specific median. Health measures include *self-rated health* (excellent; very good; good; fair; poor) and *functional limitations*, which refers to the total number of limitations of their activities of daily living (ADL), such as bathing, eating, or walking. Disconnected parents may turn to others for support, so we control for *instrumental support* received from anyone outside their household in the past twelve months. Finally, we control for the *interview country* and *interview wave.* Table 4-1 displays the means (and standard deviations) or proportions for all measures (except wave and country), stratified by gender and level of disconnectedness.

4.3.3. Analytic plan

We first contrasted unadjusted depressive symptoms and disconnectedness rates by marital status and gender. Within-gender marital status differences were evaluated using analysis of variance (ANOVA) with post-hoc comparisons, and within-marital status gender differences were evaluated with two-group *t*-tests. We used multivariable pooled OLS regression to evaluate the multiplicative associations between parent-child disconnectedness and depressive

Table 4-1. Means (and standard deviations) or proportions, all variables used in analysis

	Women			Men			
	C[a]	D[b]	Diff.	C[c]	D[d]	Diff.	Gender Diff.
Dependent variable							
Depressive symptoms (Euro-D)	2.82	3.65	***	1.90	2.63	***	*ac bd*
	(2.36)	(2.64)		(1.97)	(2.34)		
Independent variables							
Marital status							
Married, 1st	0.49	0.20	***	0.69	0.20	***	*ac*
Married, 2nd	0.05	0.13	***	0.07	0.23	***	*ac bd*
Cohabiting	0.02	0.04	***	0.03	0.06	***	*ac bd*
Divorced	0.12	0.23	***	0.09	0.33	***	*ac bd*
Widowed	0.30	0.37	***	0.10	0.13	***	*ac bd*
Never married	0.02	0.03	**	0.01	0.05	***	*ac bd*
Number of children	2.31	3.14	***	2.34	2.97	***	*ac bd*
	(1.16)	(1.71)		(1.14)	(1.62)		
Age at interview	68.05	69.64	***	67.78	67.68	*ns*	*ac bd*
	(10.13)	(9.79)		(9.69)	(9.33)		
Household size	1.98	1.64	***	2.28	1.77	***	*ac bd*
	(1.04)	(0.84)		(1.04)	(0.86)		
Help received	0.26	0.32	***	0.18	0.22	***	*ac bd*
Employment	0.20	0.13	***	0.26	0.18	***	*ac bd*
Relative poverty	0.17	0.21	***	0.12	0.18	***	*ac bd*
Education							
High education	0.20	0.14	***	0.25	0.18	***	*ac bd*
Medium education	0.37	0.35	***	0.41	0.45	***	*ac bd*
Low education	0.43	0.52	***	0.33	0.37	***	*ac bd*
Self-rated health							
Excellent	0.06	0.05	***	0.08	0.08	*ns*	*ac bd*
Very good	0.16	0.11	***	0.19	0.12	***	*ac*
Good	0.37	0.33	***	0.39	0.34	***	*ac*
Fair	0.30	0.32	*	0.26	0.30	***	*ac*
Poor	0.10	0.20	***	0.08	0.17	***	*ac bd*
Actitivies of daily living	0.23	0.42	***	0.16	0.33	***	*ac bd*
	(0.79)	(1.06)		(0.65)	(0.89)		
Observations	126,570	4,474		81,587	3,838		

Note. Person-wave observations. Statistically significant ($p < .001$) gender differences across level of disconnectedness denoted as *ac* = connected women vs. connected men, *bd* = disconnected women vs. disconnected men. Statistically significant within-gender differences denoted as ***$p < .001$, ** p < .01, * $p < .05$, ns=not significant. SHARE waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.

symptoms by marital status and gender, adjusted for covariates. To adjust for the clustered structure of the data (repeated observations of individuals) we use clustered standard errors (Arceneaux & Nickerson, 2009). Statistically significant coefficients are denoted as + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. We use this less stringent criteria because it enables us to detect meaningful patterns despite the small yet substantively important subgroups of never married and cohabiting older adults. This approach is consistent with other SHARE studies examining less frequent family forms (Schmitz, 2021). Replication files are available on OSF.

4.4. Results

4.4.1. Descriptive and bivariate analyses

Table 4-2 presents disconnectedness rates by marital status and gender. Just 1% of women in a first marriage report being disconnected, a proportion considerably lower than detected among widowed and never married (4 percent), divorced and cohabiting (6 percent), and remarried (9 percent) women. Men also evidenced significant variation across marital statuses. Just 5 percent of widowers are disconnected, compared to 9 percent of cohabiters, with much higher rates among remarried (13%), divorced (14%), and never married (17%) men. Men also reported significantly higher rates of disconnectedness than women across all marital categories except for those in a first marriage.

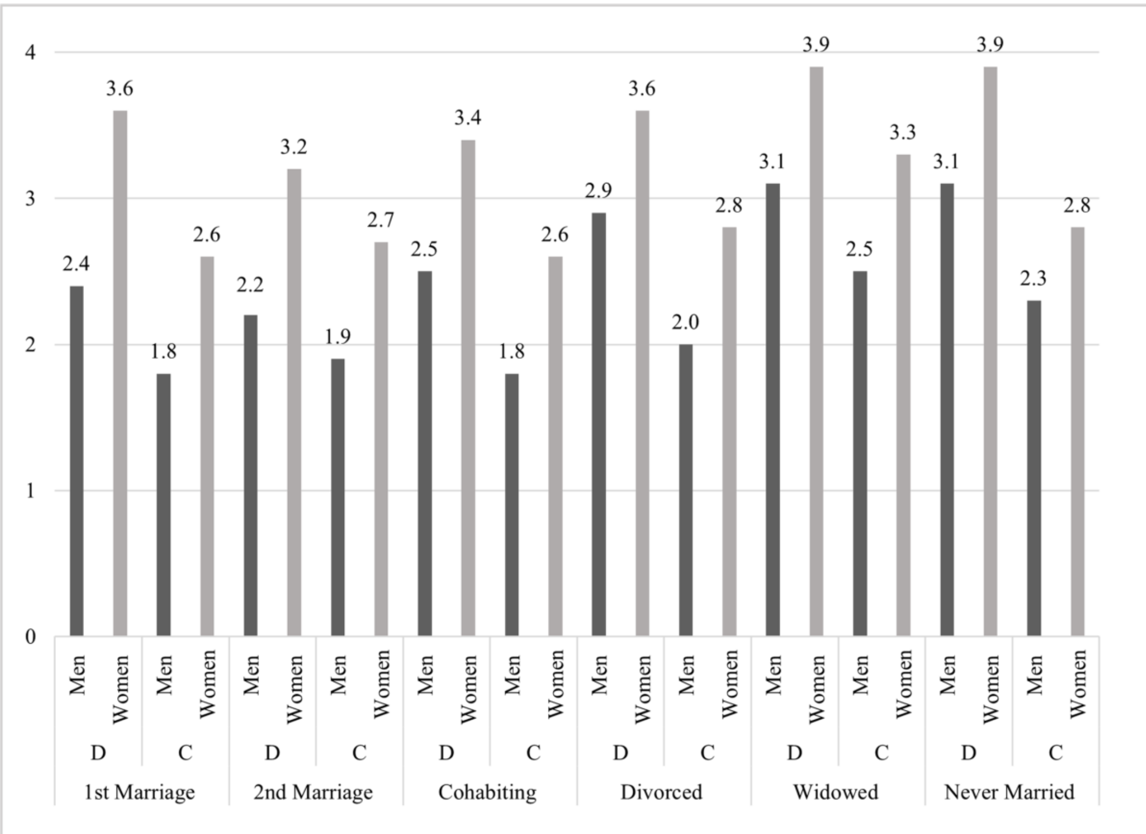
Table 4-2. Percent disconnected from child(ren) by gender and marital status

	Women		Men		Gender Diff.
	Percent	N	Percent	N	
1st marriage [a]	0.01	62,711	0.01	57,051	ns
2nd marriage [b]	0.09	6,559	0.13	6,735	***
Cohabitation [c]	0.06	2,640	0.09	2,710	***
Divorced [d]	0.06	16,824	0.14	8,942	***
Widowed [e]	0.04	39,567	0.05	8,945	***
Never married [f]	0.04	2,743	0.17	1,042	***
Within-group differences	*ab, ac, ad, ae, af, bc, bd, be, bf, ce, cf, de, df*		*ab, ac, ad, ae, af, bc, be, bf, cd, ce, cf, de, df, ef*		

Note. Statistically significant ($p < .01$) within-gender marital status differences denoted as *ab* = 1st marriage vs. 2nd marriage, *ac* = 1st marriage vs. cohabitation, *ad* = 1st marriage vs. divorced, *ae* = 1st marriage vs. widowed, *af* = 1st marriage vs. never married, *bc* = 2nd marriage vs. cohabitation, *bd* = 2nd marriage vs. divorced, *be* = 2nd marriage vs. widowed, *bf* = 2nd marriage vs. never married, *cd* = cohabitation vs. divorced, *ce* = cohabitation vs. widowed, *cf* = cohabitation vs. never married, *de* = divorced vs. widowed, *df* = divorced vs. never married, *ef* = widowed vs. never married. Statistically significant ($p < .001$) within-marital status gender differences denoted as ***; ns=not significant. Analyses based on unweighted data from SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.

We next examined whether disconnected and connected parents differ with respect to depressive symptoms, within each marital status category for men and women (Figure 4-1). Across all marital status categories, disconnected parents reported significantly more depressive symptoms than their connected counterparts, with the greatest number of symptoms detected among disconnected women (M = 3.9) and men (M = 3.1) who are widowed or never married. The largest within-marital status differences between disconnected and connected parents were found among divorced men (M = 2.9 vs. 2.0) and never married women (M = 3.9 vs. 2.8). Within every marital and connectedness category, women reported significantly more depressive symptoms than men, consistent with well-established gender gaps in depression.

Figure 4-1. Unadjusted depressive symptoms (Euro-D) by gender and parent-child disconnectedness, within each marital status category



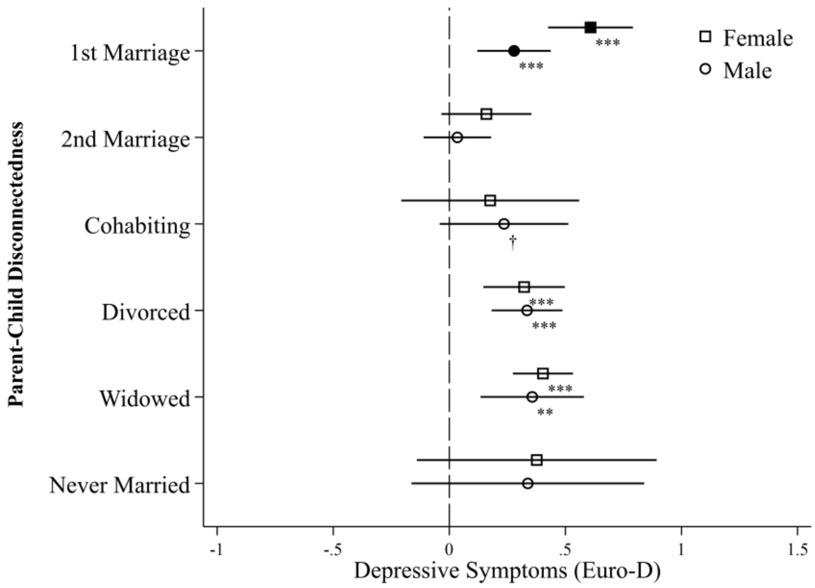
Note. All within-marital category gender differences and differences between connected (C) and disconnected (D) men and women are statistically significant at $p < 0.01$ level. Statistics based on unweighted data from SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.

4.4.2. Multivariable analyses

We next evaluated whether depressive symptom differences detected on the basis of disconnectedness, marital status, and gender persisted after adjusting for covariates. In preliminary analyses evaluating fully adjusted main effects only, we found that disconnected parents reported .32 more depressive symptoms than connected parents, women reported .68 more symptoms than men, and each marital status group reported significantly more symptoms than persons in their first marriage: remarried (b = .14), cohabiting (b = .13), divorced (b = .25), widowed (b = .32), and never married (b = .25). We also evaluated all two- and three-way interaction terms and found significant variation between marital groups and gender (see Supplemental Table A4-3 for formal tests of difference). For ease of presentation, we display POLS regression results estimated separately for each gender and marital status group (Table 4-3) and we plot fully adjusted associations in Figure 4-2. In Table 4-3, statistically significant gender differences in the association of parent-child connectedness for each marital group are denoted with superscripts. In Figure 4-2, solid markers indicate statistically significant gender differences and asterisks denote statistically significant associations of disconnectedness on depressive symptoms in each subgroup (see Supplemental Table A4-4 for results of formal significance tests).

The association between parent-child disconnectedness and depressive symptoms varies across marital groups, with less variation by gender. Among women, disconnectedness is especially distressing among those in a first marriage (b = 0.61), with this association significantly larger than for men in their first marriage (b = 0.28). The association between disconnectedness and mental health is much weaker among women in other partnered relationships, with negligible and non-significant results for those in a higher-order marriage (b = 0.16) and cohabiting women (b = 0.18). For all subgroups of unmarried women, disconnectedness is linked with elevated depressive symptoms with modest variation in effect sizes across marital statuses (b = 0.32 for divorced, 0.40 for widowed, and 0.38 for never married women). Coefficients were not statistically significant for never married women, likely due to small cell sizes.

Figure 4-2. Fully adjusted associations of parent-child disconnectedness on depressive symptoms (Euro-D) by marital status and gender



Note. Whiskers indicate 95% confidence intervals. Solid markers indicate statistically significant within-marital status gender differences. Asterisks denote whether the association of disconnectedness is statistically significant for each subgroup, where ***$p < .001$, ** $p < .01$, * $p < .05$, $^{\dagger}p < 0.1$. Models were adjusted for age, household size, education, employment, relative poverty, self-rated health, functional limitations, and nation. Results are based on unweighted data from SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.

Among men, disconnectedness is associated with depressive symptoms in most marital status groups, although we detected significant gender differences in effect sizes among once married persons only. While disconnectedness had a strong association with depressive symptoms for men in their first marriage (b = 0.28), this is still significantly smaller than for their female counterparts. Disconnectedness was not significantly associated with depressive symptoms for remarried men (b = 0.03). Among cohabiting men but not women, disconnectedness is significantly associated with depressive symptoms (b = 0.24). Disconnectedness is significantly associated with depressive symptoms among divorced (b = 0.33), and widowed men (b = 0.36), with effect sizes comparable to those detected among women. Again, we did not detect significant associations for never married men (b = 0.34), likely due to small cell sizes. Overall, parent-child disconnectedness is most distressing to women in a first marriage (b = .61) and least distressing to remarried men (b = .03).

4.5. Discussion

Our study contributes to the emerging literature on parent-child disconnectedness by documenting its prevalence and associations with mental health across marital statuses and gender differences therein in a large sample of European older adults.

Two major findings are noteworthy. First, while overall rates of disconnectedness are low (3.5%) among European older adults, a single snapshot belies vast variation on the basis of marital status and gender. Just 1 percent of men and women in a first marriage report disconnectedness, yet rates are dramatically higher for all other marital categories. Our results are consistent with a core theme of family systems theory, that a disruption to one family tie (such as a parent's divorce or repartnering) may reverberate throughout the family, destabilizing a parent's tie with one or more children (Arránz Becker & Hank, 2022). The destabilizing effects of parent's marital transitions are gender-asymmetrical, with the exception of widowhood. Widowed women and men are very similar (4 and 5%) with respect to disconnectedness, perhaps because a surviving parent is not considered blameworthy for the marriage's end and is instead viewed as deserving of the child's support and sympathy (Carr, 2003). Yet for all other unmarried categories, men have higher rates of disconnectedness, potentially reflecting an adult child's tendency to lay blame for parental divorce (or subsequent repartnering) on the father (Schmidt et al., 2016). Although we cannot ascertain causal ordering with our data, our results are consistent with studies of parent-child closeness and contact demonstrating negative effects of fathers' divorces and repartnerships (Kalmijn, 2013, 2015).

We also detected high levels of disconnectedness among never married men, although their mental health was not significantly worse than their connected counterparts. This warrants

Table 4-3. POLS Regression of the Association of Parent-Child Disconnectedness on Depressive Symptoms (Euro-D), by Marital Status and Gender

	Women						Men					
	Married, 1st	Married, 2nd	Cohabiting	Divorced	Widowed	Never married	Married, 1st	Married, 2nd	Cohabiting	Divorced	Widowed	Never married
Parent-child disconnectedness	0.61***[a]	0.16	0.18	0.32***	0.40***	0.38	0.28*** [a]	0.03	0.24+	0.33***	0.36**	0.34
	(0.09)	(0.10)	(0.20)	(0.09)	(0.07)	(0.26)	(0.08)	(0.07)	(0.14)	(0.08)	(0.11)	(0.26)
Age at interview	-0.00	-0.01**	-0.02*	-0.03***	-0.01***	-0.02*	0.00*	-0.01+	-0.00	-0.03***	-0.00	-0.04**
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Number of children	0.01	-0.02	-0.02	-0.01	-0.04***	0.02	0.03**	-0.01	0.04	-0.01	0.03	-0.05
	(0.01)	(0.02)	(0.03)	(0.02)	(0.01)	(0.05)	(0.01)	(0.02)	(0.03)	(0.02)	(0.02)	(0.09)
Help received	0.45***	0.47***	0.54***	0.30***	0.35***	0.39***	0.32***	0.34***	0.25*	0.32***	0.36***	0.42*
	(0.02)	(0.07)	(0.12)	(0.04)	(0.03)	(0.09)	(0.02)	(0.06)	(0.10)	(0.05)	(0.05)	(0.17)
Household size	0.03*	0.09+	0.08	0.07*	-0.02	0.07	0.04***	0.04	0.02	-0.06+	-0.04	-0.07
	(0.01)	(0.05)	(0.06)	(0.03)	(0.02)	(0.06)	(0.01)	(0.03)	(0.05)	(0.03)	(0.03)	(0.12)
Education (ref.: High)												
Medium	0.03	0.04	0.18	0.00	-0.02	0.11	-0.01	0.05	0.01	0.02	-0.04	-0.33+
	(0.03)	(0.08)	(0.11)	(0.05)	(0.05)	(0.13)	(0.02)	(0.06)	(0.10)	(0.06)	(0.07)	(0.19)
Low	0.12***	0.10	0.08	0.23***	0.27***	0.42**	0.05+	0.14+	0.20+	0.20**	0.09	-0.23
	(0.03)	(0.10)	(0.13)	(0.06)	(0.05)	(0.16)	(0.03)	(0.08)	(0.11)	(0.08)	(0.08)	(0.23)
Employed	-0.02	-0.06	-0.07	-0.22***	0.09	-0.07	0.02	-0.09	-0.01	-0.29***	0.05	-0.38*
	(0.03)	(0.08)	(0.11)	(0.05)	(0.06)	(0.12)	(0.02)	(0.07)	(0.10)	(0.06)	(0.11)	(0.17)
Relative poverty	0.12***	0.05	0.07	0.11*	0.15***	0.26*	0.11***	0.27**	0.19	0.12*	0.11	0.37*
	(0.03)	(0.10)	(0.16)	(0.04)	(0.03)	(0.11)	(0.03)	(0.09)	(0.13)	(0.06)	(0.07)	(0.16)
Self-rated health (ref.: Excellent)												
Very good	0.17***	0.21*	0.16	0.33***	0.14*	0.30*	0.14***	0.20**	0.08	0.23***	0.13	0.38+
	(0.03)	(0.09)	(0.13)	(0.06)	(0.06)	(0.15)	(0.02)	(0.06)	(0.11)	(0.06)	(0.10)	(0.22)
Good	0.73***	0.81***	0.69***	0.85***	0.64***	0.86***	0.51***	0.58***	0.48***	0.60***	0.45***	1.08***
	(0.03)	(0.09)	(0.13)	(0.06)	(0.06)	(0.15)	(0.02)	(0.06)	(0.11)	(0.07)	(0.10)	(0.21)
Fair	1.81***	1.98***	1.66***	1.85***	1.65***	1.76***	1.36***	1.37***	1.26***	1.57***	1.28***	1.79***
	(0.04)	(0.10)	(0.16)	(0.07)	(0.06)	(0.17)	(0.03)	(0.08)	(0.14)	(0.08)	(0.10)	(0.24)
Poor	3.22***	3.23***	3.20***	3.27***	3.16***	3.05***	2.78***	2.69***	2.49***	2.86***	2.64***	2.96***
	(0.05)	(0.14)	(0.24)	(0.09)	(0.07)	(0.23)	(0.05)	(0.14)	(0.21)	(0.12)	(0.13)	(0.33)
Activities of daily living	0.35***	0.38***	0.36***	0.34***	0.29***	0.18*	0.40***	0.43***	0.32***	0.32***	0.37***	0.29*
	(0.02)	(0.06)	(0.10)	(0.03)	(0.01)	(0.08)	(0.02)	(0.05)	(0.08)	(0.05)	(0.03)	(0.14)
R-squared	0.24	0.27	0.24	0.24	0.26	0.23	0.23	0.24	0.22	0.26	0.24	0.32
N Observations	62,711	6,559	2,640	16,824	39,567	2,743	57,051	6,735	2,710	8,942	8,945	1,042

Note. Statistically significant within-marital status gender differences in the association of disconnectedness are denoted with superscripts [a] $p < .01$. Analysis based on unweighted data SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.
[†] $p < 0.1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

further investigation in larger samples of never married fathers. Never married older men are at elevated risk of economic insecurity and poor health relative to their ever-married counterparts (Carr et al., 2024). Our results suggest that among the few never married men who have children, a considerable fraction is disconnected, heightening concerns about their isolation and economic insecurity. Given these multiple risk factors, men aging alone may be in particular need of targeted support and services. We caution that our results may underestimate the broader mental health burden of disconnectedness among fathers, as men tend to underreport depressive symptoms (Nolen-Hoeksema, 1987). Future research including indicators like suicidality, anger, and substance use could provide further insights into disconnected fathers' mental health.

Second, we found that disconnected parents have significantly more depressive symptoms than their connected counterparts, although the strength of these associations differs by marital status and gender. For two of three categories of unpartnered persons – divorced and widowed older adults – disconnected parents reported significantly more depressive symptoms than their connected counterparts, with comparable effect sizes for men and women. Although coefficients were generally similar for the small category of never married persons, they did not reach statistical significance, likely due to weak statistical power. These results are broadly consistent with stress process models, which underscore significant mental health effects of co-occurring stressors (Pearlin et al., 2005). The stress that accompanies parent-child disconnectedness may exacerbate economic and emotional strains of aging alone and the distress from a spouse's death or a marriage's dissolution.

Counter to our expectations, the emotional toll of disconnectedness did not differ significantly by gender for all categories of unmarried parents. Our results may reflect the relatively advanced age of our sample, as some researchers have noted that gender differences tend to converge with age across various outcomes (Leopold et al., 2018). Older unmarried men and women may both rely on their closest network members, including children, so parent-child disconnectedness would exact a similar toll on their mental health (Charles & Carstensen, 2010). By contrast, we detected significant gender differences in the association between mental health and disconnectedness for parents in their first marriage only. Marriage, especially long-term marriage among older adults, may maintain and reinforce gendered roles and relationships especially with respect to parent-child ties rendering disconnectedness particularly painful for women (Boerner et al., 2014).

The emotional toll of disconnectedness was greatest for mothers in a first marriage, with an effect size twice that of their male counterparts and higher than all other subgroups of women. We suspect that this finding reflects cultural expectations placed on women (and especially stably married women) to be nurturers and engaged parents. Parent-child disconnectedness may threaten a core dimension of a mother's identity (Agllias, 2013), especially among married women who may feel shame or responsibility for their child's problems that gave rise to the disconnectedness (Ryff et al., 1994). Recall that disconnectedness is very rare among once-married men and women (1 percent), which may leave them uninformed on how to navigate this unexpected rift, or feeling stigmatized or blameworthy. We encourage future explorations of this intriguing finding, with serious consideration of the role of the other spouse. With the data at hand, we cannot ascertain whether the disconnected child maintains a tie with their other parent, or whether the intergenerational rift causes marital discord that further undermines the married parents' mental health. We encourage dyadic analyses that extend beyond one parent only to more fully encompass both spouses who may differ with respect to their engagement with the disconnected child.

Lastly, our analyses revealed that partnered parents' distress in the face of disconnectedness is limited to persons in a first marriage. The effect sizes of disconnectedness are either not statistically significant or negligible in magnitude for remarried men and women and cohabiting women. This finding aligns with theoretical perspectives suggesting that the loss of a social role or tie is not uniformly distressing. For some individuals, severing contact with their child(ren) may be less distressing than maintaining a conflictual relationship, and may even be “a healthy response to an unhealthy situation” (Blake, 2017, p. 527).

4.6. Limitations

Our study has several limitations. First, SHARE lacked information on other sources of family strain and support that may counterbalance or amplify the association between depressive symptoms and disconnectedness. Future studies should further consider the number of disconnected children, parents’ perceived closeness with non-disconnected children, and whether the disconnected child is biological or step. Our measure also captures the parent’s perspective only and thus may understate the levels of disconnectedness, given research suggesting that adult children are more likely than their parents to acknowledge disconnectedness or estrangement (e.g., Reczek et al., 2024).

Second, we are unable to determine the *timing* or *duration* of disconnectedness in relation to changes in older parent’s marital status. Descriptive analyses suggest that the duration of disconnectedness is mainly important for widowed parents, as those disconnected for longer periods (two or more waves) show significantly fewer depressive symptoms compared to those with short-term disconnectedness (one wave). Moreover, we could not ascertain whether disconnectedness contributed to the parent’s divorce, if it resulted from the parent’s remarriage, or whether the disconnectedness was initiated by the parent or child. Future studies should document the complex ways that parent-child disconnectedness and partnership status changes influence one another.

Third, although SHARE is a very large sample, the relatively small number of persons in particular marital, gender, and disconnectedness categories required that we pool the data across waves. This limited our capacity to exploit the longitudinal nature of the study and track selection into and out of disconnectedness, especially the role of depressive symptoms or other potentially important omitted variables that “selected” a parent into disconnectedness. For instance, more depressed parents may withdraw from social interactions, leading to increased parent-child disconnectedness. We encourage future studies with larger samples to delve into the potential influences of omitted variable bias and reverse causality, examining within-individual change using approaches such as dynamic panel models with fixed effects (Jessee, 2023).

Finally, we focused on the aggregated sample of European adults and did not stratify on the basis of nation or region (despite controlling for nation). We are eager to see future explorations that contrast distinctive cultural and demographic contexts within Europe. In supplementary analyses, we found that rates of disconnectedness are lowest in Southern Europe and highest in Western Europe (1 vs. 6%), and the depressive symptoms gap between connected and disconnected parents was dramatically larger in Southern Europe (M = 2.7 vs. 4.6) than in Eastern, Northern, or Western Europe. These patterns are broadly consistent with research suggesting that intergenerational strain is more distressing in regions where family discord is less common (Hank, 2007).

Despite these limitations, our study makes important contributions to understanding parent-child disconnectedness, its social patterning, and mental health associations for older European adults. Our results suggest that theoretical and empirical examinations of older adults' social isolation should extend beyond measures such as "kinlessness" and should recognize that even those who are married with children may be at risk of elevated depressive symptoms when their relationship with one or more child is frayed (Patterson & Margolis, 2023). Yet we caution against interventions that broadly seek to repair disconnected parent-child ties; such efforts would need to consider source, nature, and intensity of the discord leading to the severed contact. Rather, we encourage practitioners to recognize older adults' ties that do provide support and solace, whether friends, siblings, a romantic partner, or children other than the disconnected child(ren) and to engage those ties productively in conversations about the older adults' health, health care, and other critical needs (Mair, 2019).

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4.8. Acknowledgements

This paper uses data from SHARE Waves 1, 2, 3, 4, 5, 6, 7, 8 and 9 (DOIs: 10.6103/SHARE.w1.900, 10.6103/SHARE.w2.900, 10.6103/SHARE.w3.900, 10.6103/SHARE.w4.900, 10.6103/SHARE.w5.900, 10.6103/SHARE.w6.900, 10.6103/SHARE.w7.900, 10.6103/SHARE.w8.900, 10.6103/SHARE.w8ca.900, 10.6103/SHARE.w9.900, 10.6103/SHARE.w9ca900) see Börsch-Supan et al. (2013) for methodological details.(1) The SHARE data collection has been funded by the European Commission, DG RTD through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221, SSHOC: GA N°823782, SHARE-COVID19: GA N°101015924) and by DG Employment, Social Affairs & Inclusion through VS 2015/0195, VS 2016/0135, VS 2018/0285, VS 2019/0332, VS 2020/0313 and SHARE-EUCOV: GA N°101052589 and EUCOVII: GA N°101102412. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, BSR12-04, R01_AG052527-02, HHSN271201300071C, RAG052527A) and from various national funding sources is gratefully acknowledged (see www.share-eric.eu).

4.9. Appendix

Table A4-1. Number and percentage of missing data, SHARE

	N	Percentage
Number of depressive symptoms	12,035	3.51
Parent-child disconnectedness	67,965	19.85
Age at interview	5	0.00
Gender	0	0.00
Marital status	66,218	19.34
Number of children	1,275	0.37
Instrumental support	1,803	0.53
Household size	0	0.00
Education	4,277	1.25
Employment	3,827	1.12
Relative poverty	0	0.00
Self-rated health	1,039	0.3
Activities of daily living	1,146	0.33
Interview country	0	0.00
Wave	0	0.00

Note. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0. unweighted data.

Table A4-2. Depressive symptoms (Euro-D) by marital status, gender, and parent-child (dis)connectedness

	Women				Men			
	Missing [a]	Connected [b]	Disconnected [c]	Diff.	Missing [a]	Connected [b]	Disconnected [c]	Diff.
	M (SD)	M (SD)	M (SD)		M (SD)	M (SD)	M (SD)	
1st marriage	2.5 (2.2)	2.6 (2.3)	3.6 (2.7)	*ab ac*	1.9 (2.0)	1.8 (1.9)	2.5 (2.2)	*ab ac*
2nd marriage	2.7 (2.3)	2.7 (2.2)	3.2 (2.5)	*ac*	2.0 (2.0)	1.9 (1.9)	2.2 (2.0)	*ab ac*
Cohabiting	2.5 (2.2)	2.6 (2.2)	3.4 (2.7)	*ac*	1.9 (2.0)	1.8 (1.9)	2.5 (2.2)	*ac*
Divorced	2.7 (2.3)	2.8 (2.3)	3.6 (2.6)	*ac*	2.1 (2.0)	2.0 (2.1)	2.9 (2.5)	*ac*
Widowed	3.3 (2.7)	3.3 (2.5)	3.9 (2.7)	*ac*	2.4 (2.3)	2.6 (2.3)	3.1 (2.5)	*ac*
Never married	2.6 (2.2)	2.8 (2.3)	4.0 (2.6)	*ac*	3.4 (3.3)	2.3 (2.1)	3.1 (2.5)	*ab*
Missing	2.6 (2.3)	2.6 (2.3)	3.3 (2.5)	*ac*	2.1 (2.2)	1.9 (2.0)	2.6 (2.3)	*ab ac*
N	32,428	155,272	5,391		35,540	109,041	4,758	

Note. Depressive symptoms differences across parent-child (dis)connectedness categories were evaluated using analysis of variance (ANOVA) with post-hoc comparisons. Statistically significant ($p < .05$) two-way contrasts were denoted as *ab* = Missing vs. Connected; *ac* = Missing vs. Disconnected. SHARE waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0. unweighted data

Table A4-3. POLS regression predicting depressive symptoms (Euro-D) by marital status and gender in full sample

	(1)	(2)	(3)
	B/(SE)	*B/(SE)*	*B/(SE)*
Disconnectedness	0.32***	0.49***	0.30***
	(0.03)	(0.06)	(0.08)
Female	0.68***	0.68***	0.71***
	(0.01)	(0.01)	(0.01)
Marital status (ref.: 1st Marriage)			
2nd marriage	0.14***	0.17***	0.18***
	(0.02)	(0.02)	(0.03)
Cohabitation	0.13***	0.15***	0.10*
	(0.03)	(0.03)	(0.04)
Divorced	0.25***	0.25***	0.28***
	(0.02)	(0.02)	(0.03)
Widowed	0.32***	0.32***	0.46***
	(0.02)	(0.02)	(0.03)
Never married	0.25***	0.24***	0.49***
	(0.05)	(0.05)	(0.08)
Disconnectedness x marital status (ref.: 1st marriage)			
Disconnectedness x 2nd marriage		-0.41***	-0.29**
		(0.09)	(0.11)
Disconnectedness x cohabitating		-0.28*	-0.07
		(0.13)	(0.17)
Disconnectedness x divorced		-0.15+	0.03
		(0.09)	(0.11)
Disconnectedness x widowed		-0.18*	-0.04
		(0.08)	(0.14)
Disconnectedness x never married		-0.07	-0.12
		(0.19)	(0.27)
Disconnectedness x female			0.34**
			(0.12)
Marital status (ref.: 1st marriage) x female			
2nd marriage x female			-0.00
			(0.05)
Cohabiting x female			0.09
			(0.06)
Divorced x female			-0.06
			(0.04)
Widowed x female			-0.18***
			(0.03)
Never married x female			-0.34***
			(0.10)
Disconnectedness x marital status (ref.: 1st marriage) x female			

Disconnectedness x 2nd marriage x female			-0.17
			(0.17)
Disconnectedness x cohabitation x female			-0.36
			(0.27)
Disconnectedness x divorced x female			-0.35*
			(0.17)
Disconnectedness x widowed x female			-0.29
			(0.18)
Disconnectedness x never married x female			-0.01
			(0.38)
Covariates			
Age at interview	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)
Number of children	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Help received	0.37***	0.37***	0.37***
	(0.01)	(0.01)	(0.01)
Household size	0.02**	0.02**	0.02**
	(0.01)	(0.01)	(0.01)
Education (ISCED-97, ref.: High education)			
Medium education	-0.00	-0.00	-0.00
	(0.01)	(0.01)	(0.01)
Low education	0.14***	0.14***	0.14***
	(0.02)	(0.02)	(0.02)
Employed	-0.03+	-0.03+	-0.03+
	(0.01)	(0.01)	(0.01)
Relative poverty	0.12***	0.12***	0.12***
	(0.01)	(0.01)	(0.01)
Self-rated health (ref.: Excellent)			
Very good	0.16***	0.16***	0.16***
	(0.02)	(0.02)	(0.02)
Good	0.64***	0.64***	0.64***
	(0.02)	(0.02)	(0.02)
Fair	1.63***	1.63***	1.63***
	(0.02)	(0.02)	(0.02)
Poor	3.07***	3.07***	3.06***
	(0.03)	(0.03)	(0.03)
Activities of daily living	0.34***	0.34***	0.34***
	(0.01)	(0.01)	(0.01)
R-squared	0.28	0.28	0.28
N Observations	216,469	216,469	216,469

Note. Analyses based on unweighted data from SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.
$^{\dagger}p < 0.1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A4-4. POLS regression testing interaction effects of parent-child disconnectedness and gender on depressive symptoms (Euro-D), stratified by marital status

	Married, 1st	Married, 2nd	Cohabiting	Divorced	Widowed	Never Married
	B/(SE)	*B/(SE)*	*B/(SE)*	*B/(SE)*	*B/(SE)*	*B/(SE)*
Parent-child disconnectedness	0.27***	0.01	0.21	0.33***	0.34**	0.23
	(0.08)	(0.07)	(0.14)	(0.08)	(0.11)	(0.26)
Female	0.73***	0.69***	0.81***	0.66***	0.49***	0.44***
	(0.01)	(0.05)	(0.06)	(0.04)	(0.03)	(0.10)
Parent-child disconnectedness x female	0.35**	0.18	-0.01	-0.00	0.07	0.19
	(0.12)	(0.12)	(0.24)	(0.12)	(0.13)	(0.37)
Age at interview	0.00	-0.01**	-0.01*	-0.03***	-0.01***	-0.02***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Number of children	0.02**	-0.01	0.01	-0.01	-0.03**	0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.04)
Help received	0.40***	0.42***	0.40***	0.31***	0.35***	0.39***
	(0.02)	(0.05)	(0.08)	(0.03)	(0.02)	(0.08)
Household size	0.03***	0.06*	0.04	0.02	-0.02	0.04
	(0.01)	(0.03)	(0.04)	(0.02)	(0.01)	(0.06)
Education (ISCED-97, ref.: High education)						
Medium education	0.01	0.05	0.09	0.01	-0.03	0.03
	(0.02)	(0.05)	(0.07)	(0.04)	(0.04)	(0.10)
Low education	0.09***	0.13*	0.14+	0.23***	0.23***	0.31*
	(0.02)	(0.06)	(0.08)	(0.05)	(0.04)	(0.13)
Employed	-0.00	-0.08	-0.04	-0.24***	0.08	-0.16+
	(0.02)	(0.05)	(0.07)	(0.04)	(0.05)	(0.10)
Relative poverty	0.11***	0.16*	0.12	0.13***	0.14***	0.31**
	(0.02)	(0.07)	(0.10)	(0.04)	(0.03)	(0.10)
Self-rated health (ref.: Excellent)						

Very good	0.15***	0.21***	0.08	0.29***	0.12*	0.31*
	(0.02)	(0.05)	(0.08)	(0.04)	(0.05)	(0.12)
Good	0.62***	0.69***	0.57***	0.75***	0.59***	0.91***
	(0.02)	(0.05)	(0.08)	(0.04)	(0.05)	(0.12)
Fair	1.60***	1.68***	1.44***	1.74***	1.57***	1.78***
	(0.02)	(0.07)	(0.10)	(0.05)	(0.05)	(0.14)
Poor	3.01***	2.98***	2.82***	3.13***	3.05***	3.05***
	(0.04)	(0.10)	(0.16)	(0.07)	(0.06)	(0.19)
Activities of daily living	0.38***	0.41***	0.34***	0.33***	0.31***	0.22**
	(0.01)	(0.04)	(0.06)	(0.03)	(0.01)	(0.07)
R-squared	0.26	0.28	0.25	0.26	0.27	0.25
N Observations	119,762	13,294	5,350	25,766	48,512	3,785

Note. Analyses based on unweighted data SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.
$^{\dagger}p < 0.1$, * $p < .05$, ** $p < .01$, ***$p < .001$.

Chapter 5

A research note on silver splits and parent-child disconnectedness: Mental health consequences for European older adults

Lisa Jessee & Deborah Carr

Abstract

Rising rates of "silver splits" in Europe mirror increases in gray divorce in the U.S. These dissolutions harm older adults' mental health, especially for those not in contact with their child(ren), or "disconnected" parents. However, previous studies have relied primarily on multilevel modeling, neglecting divorce-related selection effects. This research note addresses this issue by estimating fixed effects linear regression models that control for time-invariant confounders. We used data from the Survey of Health, Ageing and Retirement in Europe (SHARE; 2004-2022, N=2,216 observations, 546 silver splits) to document changes in depressive symptoms pre- and post-dissolution, and tested whether these patterns are moderated by parent-child disconnectedness. Consistent with previous research, we find that depressive symptoms increase steeply in the year of dissolution and remain high four years post-dissolution for parents who are disconnected from their child(ren). However, contrary to the assumption that dissolution is uniformly harmful, individuals who maintain a relationship with all their child(ren) show stable levels of depressive symptoms throughout the dissolution process. Our results challenge early writings on stressful life events that presume a "crisis" such as divorce/separation would have uniformly harmful mental health consequences, showing instead that not all individuals experience negative consequences.

5.1. Introduction

Rates of "silver splits" – the dissolution of marriages or romantic partnerships at or after age 50 – have risen in Europe, mirroring "gray divorce" trends in the U.S. (Alderotti et al., 2022; Brown & Lin, 2022). Spouses and romantic partners provide essential support for older adults, particularly as age-related transitions including retirement, health problems, and the deaths of age peers may diminish reliance on other social connections (Charles & Carstensen, 2002). Consequently, it is important to understand how the dissolution of older adults' romantic partnerships may affect their mental health.

The divorce-stress-adjustment model proposes that union dissolution is a process that can affect mental health even *before* the event due to stressors like relationship conflict and anticipated changes (i.e., anticipation effects; Amato, 2000). Three distinctive conceptual models offer competing perspectives regarding the time course of mental health symptoms *following* later life dissolution (Lin & Brown, 2020). The *crisis model* proposes that union dissolutions lead to short-term mental health declines with a relatively quick recovery as individuals manage temporary stressors like legal issues or residential changes, whereas the *chronic strain model* predicts persistent mental health struggles from ongoing stressors, such as loneliness and the challenges of managing household chores and finances independently (Lin et al., 2019).The *convalescence model*, specific to older adults, also notes long-lasting issues but recognizes eventual improvements due to resilience and adaptation (Lin et al., 2024; Lin & Brown, 2020).

Stress process frameworks suggest that the extent to which depressive symptoms trajectories during the silver split process align with the crisis, chronic strain, or convalescence models may vary based on the availability of coping resources (e.g., Pearlin et al., 2005). For older adults experiencing union dissolution, a strong relationship with adult children is considered an important buffer against emotional distress (Tosi & van den Broek, 2020).

Conversely, strained, conflictual or tenuous parent-child relationships may intensify and prolong the emotional consequences of dissolution. Recent research identifies one particular dimension of weak parent-child ties that heightens the mental health effects of dissolution: *disconnectedness* (Kalmijn, 2023; Lin et al., 2024).

Disconnectedness is similar to estrangement, which encompasses deficient emotional closeness and frequency of contact, and refers to the parent's lack of contact with at least one child (Reczek et al., 2024). Disconnectedness may exacerbate and lengthen older adults' post-dissolution mental health symptoms as disconnected parents may be deprived of practical or emotional support from child(ren), a resource critical to their adaptation (Lin et al., 2024). Moreover, disconnectedness may be a co-occurring stressor, creating a *double burden* that may further erode the mental health of silver splitters. Disconnectedness is more consequential than strong positive relations for older adults' mental health because weak ties are atypical, stigmatized, and emotionally painful (Gilligan et al., 2015; Lin et al., 2024). Parents who are disconnected from their children may experience a more significant and prolonged increase in depressive symptoms during a silver split compared to connected parents. This is consistent with a chronic strain perspective, as opposed to the crisis or convalescence perspectives suggested by previous research on the mental health effects of gray divorces (Lin et al., 2019; Tosi & van den Broek, 2020).

To our knowledge, Lin and colleagues (2024) are the only researchers examining parent-child disconnectedness as a contextual factor affecting depressive symptom trajectories before, during, and after gray divorce. They tracked a sample of U.S. older adults and found that all parents experienced dissolution as psychologically harmful, yet those who were disconnected from a child had significantly more depressive symptoms than their connected counterparts. These differences began to diminish two years after the dissolution and converged six years thereafter. However, applying multilevel models, the authors do not consistently account for factors that may “select” individuals into later-life separation, depressive symptoms, and disconnectedness. Moreover, it is unclear whether similar patterns would occur beyond the U.S., given theoretical writings underscoring that the emotional consequences of a purported stressor may be conditional upon the broader sociocultural context (Pearlin et al., 2005). Europe has lower rates of both divorce and disconnectedness relative to the U.S., so older adults experiencing the “double burden” of these concomitant stressors may be particularly vulnerable to sustained depressive symptoms.

Against this background, this research note examines whether the depressive symptoms trajectories documented in the U.S. pre- and post-gray divorce for connected versus disconnected parents also are observed among “silver splitters” in Europe, when properly accounting for selection into later-life separation, depressive symptoms, and disconnectedness. We use longitudinal data from eight waves (2004-2022) of data from the Survey of Health, Ageing and Retirement in Europe (SHARE). Estimating fixed effects regression models enables us to adjust for time-invariant characteristics, such as personality traits, childhood experiences, genetic factors, or the length of the partnership, that would potentially confound statistical associations among relationship dissolution, depressive symptoms, and disconnectedness (Tosi & van den Broek, 2020). Although information on some time-invariant confounders, such as socioeconomic status, are available in the SHARE, a fixed-effects approach allows us to capture both *observed* and *unobserved* individual confounding factors by subtracting the individual mean from the observed values of all variables. Failure to account for these factors may overestimate or underestimate the associations among our focal measures.

5.2. Methods

5.2.1. Data

Data are from SHARE, a longitudinal biennial survey of adults aged 50+ in Europe and Israel (Börsch-Supan et al., 2013), spanning eight waves (1 to 9, excluding wave 3) from 2004 to

2022 across 26 nations (see below for detailed country information). Unlike single-nation surveys, the large sample size of SHARE allows to follow within-person trajectories among parents who recently experienced a silver split, stratified by parent-child disconnectedness. We excluded Israel (the only non-European country in SHARE) and Ireland (with only one wave of data), as well as wave 3 data, which only included retrospective life course information. Our baseline sample comprises 146,868 individuals contributing to 383,961 person-wave observations.

Our main goal is to trace *within-person changes* in older parents' depressive symptoms pre- and post-relationship dissolution. Thus, we limit our sample to parents who are at risk of and subsequently experience a silver split. We exclude from our analytic sample individuals who are: under 50 (n=3,740); not in a partnership at baseline (n=44,008); continuously partnered throughout the observation period (n=58,516); respondents without children 18+ years (n=6,624); with only one wave of data (n=33,433); or who experienced two or more silver splits during the study (n=1). Our sample includes 546 parents who experienced a silver split, with an average of four observations per participant, totaling 2,216 observations.

5.2.2. Measures

Depressive symptoms are assessed with the 12-item EURO-D scale (Prince et al., 1999). Respondents indicate whether they have experienced each symptom in the past 12 months: depression, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, lack of enjoyment, and tearfulness. Symptom counts range from 0 to 12. We used a natural log transformation to address the skewed distribution of symptoms (M = 2.6, SD = 2.3). Results were consistent across models, so we retain the count for ease of interpretation (results available from authors).

Our focal independent variable is the time to and since a *silver split* (Alderotti et al., 2022). The category encompasses persons who either: transitioned from married to divorced (n=472);

ended a registered partnership (n=20); or dissolved a cohabiting relationship (n=53) during the observation period. In Europe, registered partnerships are comparable to marriages, offering some of the same legal rights and benefits. To have adequately powered moderation analyses, we combined these two groups into a single non-marital dissolution category (n=73). Descriptive statistics for the two dissolution categories are presented in Table 5-1. We did not detect statistically significant differences in depressive symptoms (2.70 vs 2.40) or rates of parent-child disconnectedness (8 vs. 12%) for marital versus non-marital dissolutions.

Table 5-1. Descriptive statistics, by relationship dissolution status

	Marital Dissolution	Non-Marital Dissolution	Difference
Depressive symptoms (range: 0 to 12)	2.70 (2.42)	2.40 (2.12)	*ns*
Parent-child disconnectedness	0.08	0.12	*ns*
Age at baseline	65.13 (6.50)	65.48 (7.23)	*ns*
Self-rated health			
Excellent	0.11	0.08	*ns*
Very good	0.22	0.16	*ns*
Good	0.37	0.29	*ns*
Fair	0.21	0.37	***
Poor	0.09	0.10	*ns*
Perceived financial difficulties	0.37	0.41	*ns*
Employed	0.32	0.37	*ns*
Female	0.53	0.51	*ns*
European region			
Northern	0.27	0.27	*ns*
Eastern	0.15	0.31	***
Southern	0.13	0.05	**
Western	0.45	0.37	*ns*
Any values imputed	0.06	0.13	**
N	1,020	153	

Note. Means (and standard deviations) shown for continuous measures and proportions shown for categorical measures. Values based on person-wave data. Statistically significant differences denoted as * $p < .05$, ** $p < .01$, *** $p < .001$, *ns* not significant. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0. unweighted data.

Multivariable analyses showed no significant differences in symptom trajectories between marital and non-marital unions, and restricting our analytic sample to marital dissolutions only resulted in similar patterns as for the full sample of silver splitters (see Appendix Figure A5-1). Therefore, we did not stratify by dissolution subtype in the reported analyses.

SHARE data lacks precise information on divorce/separation dates. Thus, we documented depressive symptoms throughout the dissolution process using five timing indicators based on the current and last interview year: (1) at least four years pre-split (baseline and reference group), (2) between one to three years pre-split, (3) the year in which the split was first recorded, (4) one to three years post-split, and (5) more than four years post-split. In the first (4+ years pre-split) and last (4+ years post-split) categories, we pooled all observations that occurred 4 years or more before or after the split. Consequently, respondents could contribute multiple observations to these categories if they had multiple data points in these time frames. Note that across Europe, divorce proceedings vary in length, with separations often occurring months or years before the legal divorce. Including data before the split may reflect effects tied to the separation phase. Table 5-2 displays the distribution of timepoints.

Table 5-2. Number of observations across silver split stages

	N	%
Years before/after the silver split		
-4 or more	714	32,2
-1 – 3	302	13,6
0 (year of the silver split)	546	24,6
+1 – 3	204	9,2
+4 or more	450	20,3
N	2,216	100

Note. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0. unweighted data.

Following Lin and colleagues (2024), *parent-child disconnectedness* in the year of the split refers to parents' lack of contact with at least one adult child in the 12 months pre-split (in person, by phone, or mail). We measure disconnectedness in the year of the silver split to capture the immediate (lack of) availability of social support and the immediate source of a double burden. Focusing on disconnectedness from at least *one child* (as opposed to all children) aligns with research showing that having only one child that faces challenges or has a strained relationship with their parents can negatively affect parental well-being (Fingerman et al., 2012). The reference category includes parents in contact with all of their children. In our sample, ten percent of parents were disconnected from at least one child. Of the disconnected parents, 29 percent were disconnected from all of their children (1.8 percent of total sample). Depressive symptoms did not differ significantly for the two subgroups of disconnected parents, so we did not stratify analyses by number of children from whom the parent is disconnected. Due to the small sample size, we were not able to distinguish between biological and non-biological children. In our overall sample, 72 percent of disconnected parents were separated from a biological child. Future research should address this issue with larger sample sizes, allowing a more detailed examination of disconnectedness by parental status.

(Un-)observed time-variant confounders, such as number of children, education, genetic factors, personality traits and relationship duration, are automatically accounted for in our modelling approach. Hence, we adjusted for *time-varying* covariates only. These include *current self-rated health* (range: 1 = excellent to 5 = poor); and *current employment status* (1 = employed or self-employed vs. 0 = retired, unemployed, constantly sick or disabled, homemaker). We adjusted for *age* and *age-squared* to account for a potential U-shaped association between age and depressive symptoms. We also adjusted for two mechanisms through which silver splits may affect mental health: formation of a *new romantic partnership,* a source of emotional uplift following dissolution and *financial hardship,* a risk factor for post-dissolution stress. Perceived financial hardship was measured with the item “Thinking of your household’s total monthly income, would you say that your household is able to make ends meet?” We constructed a dichotomous indicator of “great” or “some difficulties” versus “fairly easily” or “easily.”

For the 14 percent of respondents who had a missing value on at least one variable used in the analysis, we imputed missing values using chained equations (See Appendix Table A5-1 for item-specific missingness). We imputed 10 datasets, performed all analyses on each imputed dataset and combined coefficients. Multivariable analyses included a variable signifying *whether any values were imputed.*

Finally, to explore variation across sociocultural contexts, we pooled countries into *geographic regions*: Northern (Sweden, Denmark, Finland), Western (Austria, Belgium, France, Germany, Luxembourg, Netherlands, Switzerland), Eastern (Czech Republic, Slovenia, Poland, Estonia, Croatia, Hungary, Slovakia, Romania, Malta, Latvia, Bulgaria, Lithuania), and Southern Europe (Spain, Italy, Greece, Portugal), consistent with prior studies based on SHARE (Danielsbacka et al., 2011).

5.2.3. Analytic plan

We apply fixed effects linear regression models with robust standard errors to account for unobserved characteristics that may confound the associations among silver splits, disconnectedness, and depressive symptoms. Omitting important (unobserved) variables can lead to an over- or underestimation of the true effects (*omitted variable bias*). Fixed effects panel regression models allow researchers to address omitted variable bias for *unobserved* stable individual characteristics, such as personality traits, childhood experiences, or genetic factors, by subtracting the individual mean from the observed values of all variables (Vaisey & Miles, 2017). Moreover, fixed effects panel regression models automatically account for *observed* time-invariant characteristics, such as gender, education, and number of children. We find sufficient within-individual variation to justify a fixed effects approach (see Appendix Table A5-2).

Fixed effects regression models use each individual as their own control over time to focus on changes that occur *within* individuals. We modeled a change in depressive symptoms as a function of time before, during, or after the split. The equation is specified as follows:

$$EUROD_{it} = \beta_1 \, SILVERSPLIT_{it} + \beta_2 x_{2it} + \cdots + \beta_k x_{\mathrm{k}it} + \mu_i + \varepsilon_{it}$$

where *EUROD* represents the EURO-D score, our outcome, for individual i at time t. *SILVERSPLIT*, our focal predictor, categorizes periods relative to the split event. Other time-varying covariates are accounted for by variables $x2,...,xk$ for individual i at time t. The term μi captures individual-specific characteristics that remain constant over time (fixed effects) for individual i. Finally, $\mathcal{E}$ denotes the error term that varies across both time and individuals.

To investigate the moderating role of parent-child disconnectedness on the mental health trajectories of silver splitters, we estimated regressions separately for connected and disconnected parents. To test for statistically significant differences between connected and disconnected parents, we estimated fully interacted models (see Appendix Table A5-3 for complete results; Replication files available here).

5.3. Results

5.3.1. Bivariate analysis

Table 5-3 provides descriptive statistics for all variables in the analysis, based on parent-child connectedness. Disconnected parents report significantly more depressive symptoms than connected parents (3.64 vs. 2.54), and also are more likely to have other risk factors for depressive symptoms including fair or poor self-rated health (45 vs. 28%), and perceived financial difficulties (52 vs. 35%). The two subgroups also differ along demographic characteristics, such that disconnected parents are more likely to be male, not working and from Western Europe.

Table 5-3. Descriptive statistics by parent-child connectedness status

	Disconnected	Connected	Difference
Depressive symptoms (range: 0 to 12)	3.64	2.54	***
	(2.54)	(2.30)	
Age at baseline	63.12	62.27	*ns*
	(7.32)	(7.07)	
Self-rated health			
Excellent	0.10	0.12	*ns*
Very good	0.13	0.23	**
Good	0.32	0.36	*ns*
Fair	0.32	0.21	***
Poor	0.13	0.07	**
Perceived financial difficulties	0.52	0.35	***
Employed	0.28	0.43	***
Female	0.29	0.55	***
European Region			
Northern	0.21	0.26	*ns*
Eastern	0.19	0.18	*ns*
Southern	0.06	0.13	**
Western	0.54	0.43	**
Repartnered post-dissolution	0.01	0.01	*ns*
Any values imputed	0.14	0.11	*ns*
N	211	2,005	

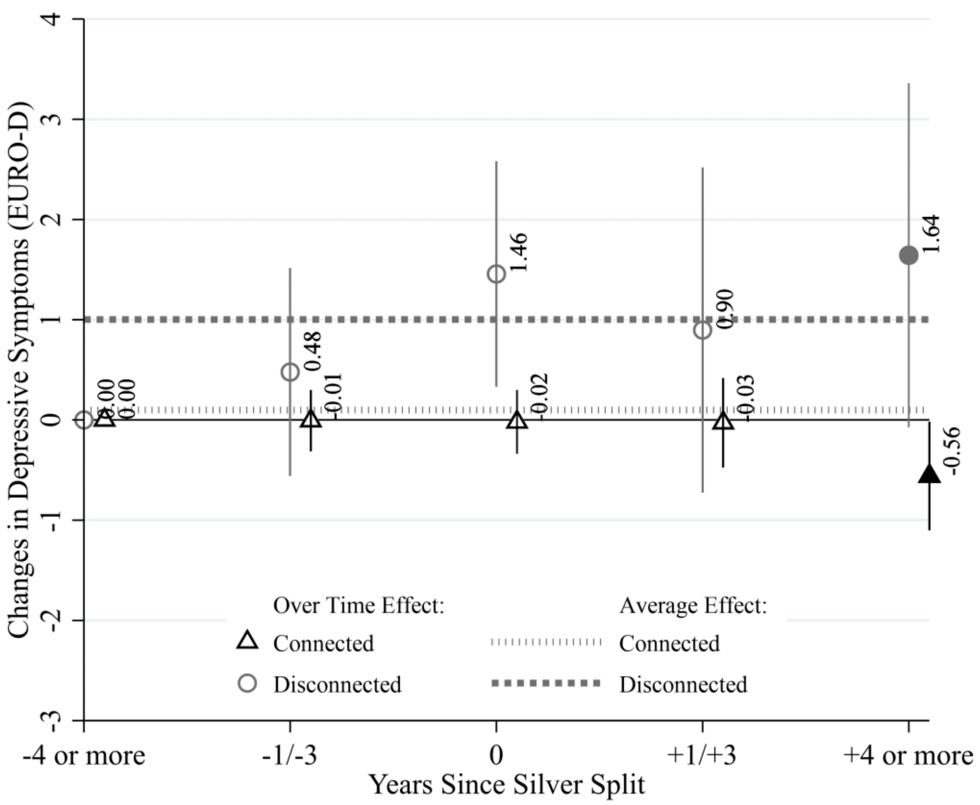
Note. Means (and standard deviations) shown for continuous measures, and proportions shown for categorical measures. Values based on person-wave data. Statistically significant differences denoted as * p < .05, ** p < .01, *** p < .001, *ns* not significant. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0. unweighted data.

5.3.2. Multivariable analysis

We next explore the extent to which parent-child connectedness status is associated with depressive symptoms trajectories, net of all covariates. Figure 5-1 shows depressive symptoms changes across the time period four years pre- to four years post-dissolution for parents who are versus are not disconnected from at least one child. Regression coefficients are presented in Table 5-4.

The circles and triangles indicate levels of *within-person change* in depressive symptoms *over time* for disconnected and connected parents, respectively; solid symbols denote statistically significant differences. The dotted lines denote the *average change* in depressive symptoms after experiencing a dissolution, regardless of the time point during the process. We show this contrast to demonstrate how studies that fail to consider distinctive time points offer an incomplete portrayal of the mental health effects of dissolution.

Figure 5-1. Changes in depressive symptoms during the four years before and after a silver split



Note. Fully adjusted regression coefficients and 95% confidence intervals shown. Solid markers indicate statistically significant differences between connected and disconnected respondents. Data are from unweighted SHARE data, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0.

Three main findings emerged. First, among connected parents, depressive symptoms showed no significant changes from four years before to two years after a split. However, four or more years post-split, these parents experienced a significant *decrease* in symptoms, reporting 0.56 fewer symptoms compared to baseline. This suggests that connected parents do not face mental health declines during or immediately after a dissolution; instead, they remain relatively resilient and experience improvements in mental health over time.

Second, disconnected parents experience significant decrements in mental health throughout the dissolution process, although these changes do not unfold in a linear pattern. Depressive symptoms increase slightly before the split, but the change is modest (0.48) and not statistically significant, showing limited evidence of anticipation effects. They then experience a significant increase in depressive symptoms in the year of the split (1.46), with this spike persisting and even increasing slightly (1.64) four years post-dissolution. In the short term after dissolution (two years), they show some improvement from the transition year but still fare worse than at baseline (0.90). These results reveal that for parents who are disconnected from a child, mental health erodes upon the dissolution, and does not return to pre-dissolution levels even four or more years following the split, consistent with chronic strain models.

Third, disconnected parents consistently show larger changes in depressive symptoms compared to connected parents, with the most pronounced disparities observed at the latest time point, as indicated by significant interaction coefficients (see Appendix Table A5-3 for interaction results).

We further explored whether depressive symptom trajectories differed by gender, anticipating that women would be more vulnerable to disconnectedness due to its rarity and stigmatization among mothers compared to fathers (Reczek et al., 2023). In our analytic sample, 14 percent of men but just 5 percent of women were disconnected. Due to small cell sizes, we could not examine differences by connectedness interaction terms at each time point of the dissolution process and instead focused on average mental health differences pre- and post-separation. Consistent with previous research (Lin et al., 2024), we did not detect large statistically significant gender differences in the mental health consequences of dissolution and parent-child disconnectedness (see Appendix Table A5-4). While disconnected mothers and fathers experienced a similar increase in depressive symptoms, it is important to recognize that women generally report more symptoms than men, resulting in a higher risk of elevated depression. Descriptive analyses indicate that disconnected women report more than four depressive symptoms in the year of and two years after a silver split, and more than six

Table 5-4. Fixed effects linear regression models predicting changes in depressive symptoms over time

	Disconnected	Not Disconnected
	B/(SE)	*B/(SE)*
Years Since Silver Split (ref.: -4 or More)		
-1 – 3	0.48	-0.01
	(0.53)	(0.16)
0 (Year of Silver Split)	1.46*	-0.02
	(0.57)	(0.16)
+1 – 3	0.90	-0.03
	(0.83)	(0.23)
+4 or More	1.64+	-0.56*
	(0.88)	(0.28)
Age	-0.03	-0.06
	(0.37)	(0.13)
Age-squared	-0.00	0.00
	(0.00)	(0.00)
Self-rated health (ref. Excellent)		
Very Good	0.21	-0.07
	(0.67)	(0.14)
Good	0.66	0.28+
	(0.89)	(0.15)
Fair	1.56+	1.10***
	(0.82)	(0.19)
Poor	2.97**	2.00***
	(1.04)	(0.29)
Financial Difficulties	0.22	0.39***
	(0.36)	(0.11)
Employment	-0.06	0.12
	(0.59)	(0.13)
Repartnered	1.38+	0.32
	(0.69)	(0.52)
Flag: Imputed Values	0.30	-0.13
	(0.67)	(0.17)
N Observations	211	2,005
N Individuals	49	497

Note. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0. unweighted data.
[†]*p* < 0.1, * *p* < .05, ** *p* < .01, ****p* < .001.

symptoms four or more years later, exceeding the threshold for elevated depression (Prince et al., 1999).

We also evaluated whether depressive symptoms of connected versus disconnected parents varied across geographic regions, given regional differences in family norms and obligations

(Hank, 2007). Compared to disconnected silver splitters in Southern Europe, disconnected silver splitters in all other regions experienced a smaller increase in depressive symptoms, however, none of the interaction terms were statistically significant given small cell sizes (see Appendix Table A5-5).

5.4. Discussion

This research note challenges early writings on stressful life events that presume a "crisis" such as a dissolution would have uniformly harmful mental health consequences (Holmes & Rahe 1967). In line with previous research, the findings reveal that depressive symptoms increase steeply in the year of dissolution and remain high four years post-dissolution for disconnected parents. However, contrary to the common belief that silver splits impose mental health burdens regardless of parent-child connectedness (Lin et al., 2024), our findings show that individuals who maintain relationships with all of their children remain relatively stable in their depressive symptoms throughout the dissolution process; their mental health even improves in the longer term. Thus, while disconnected parents experience silver splits as a chronic strain and are particularly vulnerable, we also identify a particularly protected group – connected parents. The results of the research note are encouraging, indicating that for older European adults who dissolve their unions and are connected with their children, the psychological effects of dissolution are muted.

The patterns found in this research note align with stress process perspectives that identify personal and contextual factors that condition the mental health consequences of stress (e.g., Pearlin et al., 2005). Connected parents demonstrate resilience and adaptability during the process of later-life dissolution, likely because they are well equipped to manage the stress associated with the dissolution of their romantic relationship and to seek out or even embrace new opportunities for happiness. Our findings also may reflect the instrumental or material support provided by adult children (Lin et al., 2024); parents who maintain a relationship with all of their children may face less economic insecurity or fewer unmet care needs, mitigating common secondary stressors of dissolution, especially among women (Leopold, 2018; Lin et al., 2019). Connected older parents may even choose a silver split proactively to protect or improve their mental health, particularly because they have a strong support network they can rely on during challenging times. Importantly, our fixed effect approach also addresses the possibility that unobserved factors like a disagreeable personality or a history of poor-quality relationships explain the processes documented here.

However, in accordance with Lin and colleagues (2024), it is equally important to acknowledge the significance of weak relationships between parents and children in the silver split process. Although disconnected parents accounted for just 10 percent of our sample, they are an important subpopulation worthy of study, given their long-term vulnerability. We encourage practitioners and policy makers to recognize the distinctive vulnerabilities of disconnected parents and to provide other sources of support in the aftermath of later-life separation. Successful interventions may focus on strengthening parent-child ties throughout the dissolution process, or enhancing other protective non-familial ties.

Whereas our findings broadly align with Lin and colleagues (2024) in terms of disconnected parents, our results diverge with respect to connected parents, for whom we detect *no* mental health decline during a silver split. These divergent findings may reflect the different methods used and the broader sociocultural context (Europe vs. U.S.). On the one hand, the use of fixed effects regression estimation allowed us to account for selection into silver split due to, for instance, personality traits, genetic factors, or the length of the partnership. On the other hand, a cross-national study by Silverstein and colleagues (2010) has shown that the relationship between parents and their adult children in the United States is more likely to show both low affection and high conflict ('*disharmonious'* relationship) or low affection and low conflict ('*distant'* relationship) than parent-child relationships in Europe. The authors attribute this finding to the "individualistic ideology regarding kinship ties" in the U.S. (Silverstein et al., 2010, p. 1017). Consequently, even when U.S. parents maintain contact with their children, their bonds may not be strong and therefore not "protective" during a dissolution.

Our study tackles important methodological shortcomings by applying fixed-effects regression, yet our study also has limitations that invite exploration in future work. First, the numbers of persons experiencing silver splits, especially non-marital splits, and parent-child disconnectedness were modest, thus we could not explore further sources of heterogeneity, such as the number of disconnected children and perceived closeness with non-disconnected children. Second, our measure of disconnectedness referred to contact during the year of the split only. We did not examine whether the disconnectedness led to or resulted from the split, nor can we identify whether the parent or child instigated the disconnectedness. For instance, a child may recede from family interactions following a split to avoid conflict and tension. Finally, similar to earlier work (Lin et al., 2024; Tosi & van den Broek, 2020), our study lacks detailed information on the dissolution date (available only for marital dissolutions). This limitation may result in an underestimation of short-term mental health declines related to separation, especially if the separation occurred a longer time before the current interview, considering the two-year gap between interviews.

Despite these limitations, our study makes important contributions to the study of gray divorce, silver splits, and late-life stress more broadly, revealing that there is not a single mental health profile that emerges within the context of stressful life events. Our findings encourage researchers to use advanced longitudinal methods, such as fixed effects regression models, which adequately account for selection into divorce as well as other potentially stressful family transitions in later life. Without these approaches, results may be biased (Leopold, 2018; Tosi & van den Broek, 2020). Our findings further highlight the importance of considering other social, political, or cultural contexts in which both divorce and disconnectedness are even more stigmatized, such as those found in societies in which filial piety is still a fundamental value. However, based on our findings, we hope that our results challenge the narrative of later life dissolution as a universal crisis or ongoing strain, and instead offer a new perspective, recognizing vulnerable *and* protected groups within the process of later life dissolution.

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5.6. Acknowledgements

This paper uses data from SHARE Waves 1, 2, 3, 4, 5, 6, 7, 8 and 9 (DOIs: 10.6103/SHARE.w1.900, 10.6103/SHARE.w2.900, 10.6103/SHARE.w3.900, 10.6103/SHARE.w4.900, 10.6103/SHARE.w5.900, 10.6103/SHARE.w6.900, 10.6103/SHARE.w7.900, 10.6103/SHARE.w8.900, 10.6103/SHARE.w8ca.900, 10.6103/SHARE.w9.900, 10.6103/SHARE.w9ca900) see Börsch-Supan et al. (2013) for methodological details.(1) The SHARE data collection has been funded by the European Commission, DG RTD through FP5 (QLK6-CT-2001-00360), FP6

(SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221, SSHOC: GA N°823782, SHARE-COVID19: GA N°101015924) and by DG Employment, Social Affairs & Inclusion through VS 2015/0195, VS 2016/0135, VS 2018/0285, VS 2019/0332, VS 2020/0313 and SHARE-EUCOV: GA N°101052589 and EUCOVII: GA N°101102412. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, BSR12-04, R01_AG052527-02, HHSN271201300071C, RAG052527A) and from various national funding sources is gratefully acknowledged (see www.share-eric.eu).

5.7. Appendix

Table A5-1. Overview of number and share of missing values

	N	Percentage
Number of Depressive Symptoms	34	1.53
Silver Split	0	0.00
Parent-Child Disconnectedness	198	8.9
Age at Interview	0	0.00
Self-Rated Health	1	0.04
Financial Hardship	43	1.93
Employment	24	1.08

Note. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.

Table A5-2. Variable composition of depressive symptoms among connected and disconnected respondents

Euro-D		Range	Mean	SD	N
Connected		0 – 12			1,973
	overall		2.5	2.3	
	between			1.9	
	within			1.4	
Disconnected		0 – 10			209
	overall		3.6	2.5	
	between			1.8	
	within			1.8	

Note. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0.

Table A5-3. Differences in depressive symptoms following a silver split by parent-child disconnectedness (full interaction model)

	Depressive Symptoms
	B/(SE)
Time Before/Since Silver Split (ref.: -4 Years or More)	
-2 Years	0.05
	(0.15)
Year of Silver Split	0.06
	(0.16)
+2 Years	0.07
	(0.22)
+4 Years or More	-0.41
	(0.27)
Time Before/Since Silver Split (ref.: -4 Years or More) x Disconnected	
-2 Years x Disconnected	-0.04
	(0.52)
Year of Silver Split x Disconnected	0.76
	(0.49)
+2 Years x Disconnected	0.17
	(0.69)
+4 Years of More x Disconnected	0.99*
	(0.50)
N Observations	2,216
N Individuals	546

Note. Controlled for age, changes in self-rated health, employment status, financial difficulties, if respondents repartnered and for imputed values. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0. unweighted data.
†$p < 0.1$, * $p < .05$, ** $p < .01$, ***$p < .001$.

Table A5-4. Gender differences in depressive symptoms following a silver split by parent-child disconnectedness

	Depressive Symptoms
	B/(SE)
Silver Split (ref.: Partnered)	0.13
	(0.14)
Silversplit x Disconnected	0.82+
	(0.46)
Silversplit x Woman	-0.02
	(0.17)
Silversplit x Woman x Disconnected	-0.42
	(0.71)
N Observations	2,216
N Individuals	546

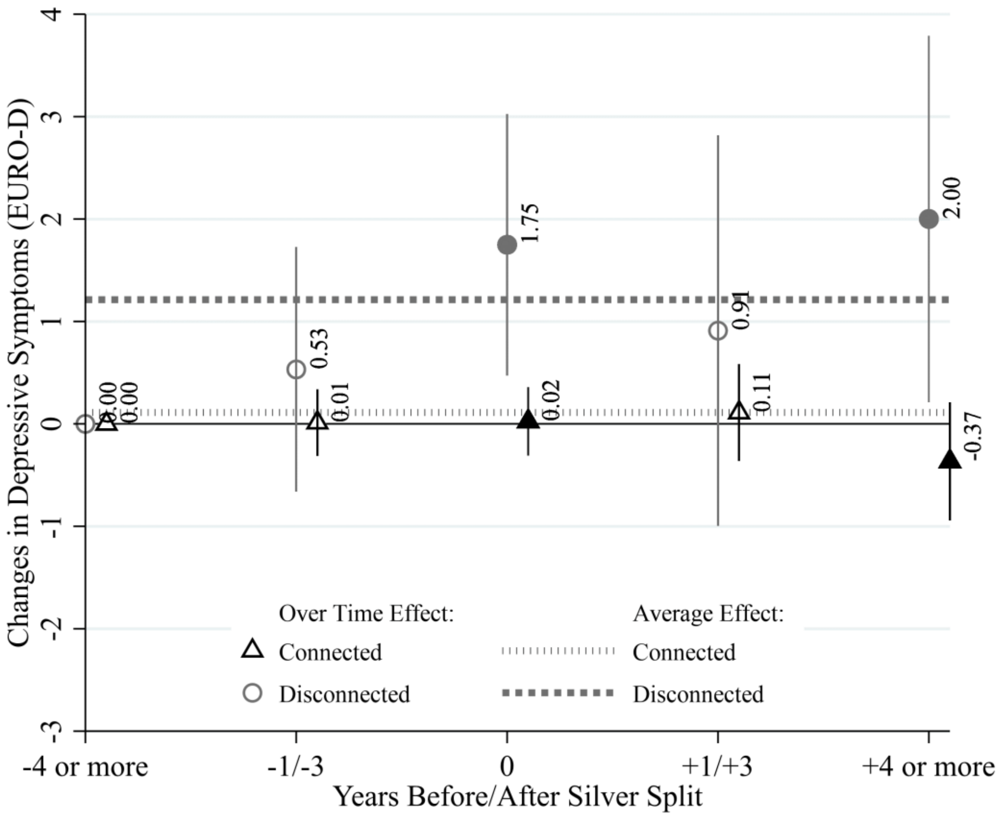
Note. Controlled for age, changes in self-rated health, employment status, financial difficulties, if respondents repartnered and for imputed values. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0. unweighted data.
†$p < 0.1$, * $p < .05$, ** $p < .01$, ***$p < .001$.

Table A5-5. Regional differences in depressive symptoms following a silver split by parent-child disconnectedness

	Depressive Symptoms
	B/(SE)
Silver Split (ref.: Partnered)	0.61*
	(0.26)
Silver Split x Disconnected	2.01
	(2.21)
Silver Split x Region, Ref.: Southern	
Silver Split x Northern	-0.26
	(0.30)
Silver Split x Eastern	-0.70*
	(0.31)
Silver Split x Western	-0.66*
	(0.27)
Silver Split x Disconnected x Region, Ref.: Southern	
Silver Split x Disconnected x Northern	-1.97
	(2.27)
Silver Split x Disconnected x Eastern	-0.78
	(2.43)
Silver Split x Disconnected x Western	-1.27
	(2.25)
N Observations	2,216
N Individuals	546

Note. Controlled for age, changes in self-rated health, employment status, financial difficulties, if respondents repartnered and for imputed values. SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9, release 9.0.0. unweighted data.
†$p < 0.1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure A5-1. Fixed effects linear regression models predicting changes in depressive symptoms for marital dissolutions



Note. Whiskers indicate 95% confidence intervals. Labels indicate regression coefficients. Black and grey markers indicate statistically significant differences between connected and disconnected respondents ($p<0.1$). SHARE, waves 1, 2, 4, 5, 6, 7, 8, 9 release 9.0.0. unweighted data. Controlled for age, changes in self-rated health, employment status, financial difficulties, if respondents repartnered and for imputed values.