The cumulative effect of grandchild care on cognitive functioning: Examining heterogeneities across gendered work-family life courses in Europe

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Introduction

As unpaid caregivers, grandparents occupy a central place in European family care systems, raising questions about whether this role is important for healthy ageing (Bordone et al., 2023). Caregiving in later-life could simultaneously impose stress while providing cognitive stimulations through social engagement, prompting scholars to hypothesize that providing childcare can mitigate normative age-related cognitive decline (e.g., Arpino & Bordone, 2014). Longitudinal research that used concurrent (e.g., Caputo et al., 2024) and lagged measures (e.g., Chereches et al., 2025) of grandchild care to explain an association with cognitive measures at a point in time have produced mixed evidence. Yet, cognitive consequences may extend beyond the concurrent and lagged effects when caregiving is sustained over time, operating through two potential mechanisms: wear-and-tear, whereby long-term stress exposure depletes individuals' physical and psychological resources (McEwen & Seeman, 1999) and adaptation, whereby individuals eventually develop coping strategies that mitigate these strains (Bowling, 2014). Moreover, a life course approach captures how prior experiences in work and family domains stratify both who becomes a family caregiver and who faces risk of faster cognitive decline (Carmichael & Ercolani, 2016; Tattarini et al., 2025). For example, Italian grandmothers with prior labor market experience are more likely to engage in childcare compared to those without (Zanasi et al., 2022). Yet, how such work-family life courses affect the cognitive consequences of cumulative grandchild care remains underexplored.

Thus, our study contributions are twofold. First, we capture gendered patterns of employment and family trajectories by applying multichannel sequence and cluster analysis (MCSQA) on retrospective life history information (ages 15 to 49) from the Survey of Health, Ageing, and Retirement in Europe (SHARE) to identify distinct work-family life course typologies among men and women between the ages 50 and 80. Second, we then employ fixed-effects panel regression models to assess whether the cognitive consequences of cumulative grandchild care reflect wear-and-tear or adaptation, depending on individuals' prior trajectories. Our findings offer important insights for navigating Europe's evolving demographic reality, where grandparents increasingly serve as indispensable yet potentially vulnerable pillars of family support.

Data and methods

Data and sample selection

Our analysis drew from a longitudinal sample of individuals from eight waves of the Survey of Health, Ageing, and Retirement in Europe (SHARE): 1 (collected in 2004-2005), 2 (2006-2007), 4 (2011-2012), 5(2013), 6 (2015), 7 (2017), 8 (2019-2020), and 9 (2021-2022). We also utilized data from SHARELIFE's Job Episodes Panel, a longitudinal job and family history dataset derived from the retrospective SHARELIFE project (waves 3 and 7) that contains the labor market, parenthood, and partnership status of each respondent at every age in his/her life (Brugiavini et al., 2019). We included individuals between the ages of 50 and 80 who participated in both the SHARELIFE and the panel SHARE waves. Following the standardization of the sequences, we performed the MCSQA on N = 1,090,110 person-year observations for men (n = 31,146) and N = 1,366,365 person-year observations for women (n = 39,039). To focus on the effects of grandchild care, we include only individuals who reported having grandchildren at any point during the study period, removing N = 60,237 observations. After restricting the sample to individuals with at least two completed panel interviews and complete information on our study variables, we arrived at a final working sample of N = 18,483 observations from 6,455 men and N = 23,250 observations from 7,933 women, with three completed interviews per respondent on average.

Outcome variables

We considered two different measures of cognitive functioning: memory recall and verbal fluency (Harris & Dowson, 1982; Rosen, 1980). Memory recall is a summative score representing the number of words each individual could recall immediately afterwards (immediate recall) and after a delay without rereading the words (delayed recall). Verbal fluency score represents the total number of animals that each participant was able to correctly produce (excluding repetitions) within the given time frame.

Explanatory variables

Our measures of grandchild care were based on responses to the question: *"During the last 12 months, have you regularly/occasionally looked after [your grandchild/grandchildren] without the presence of the parents?"* We constructed a cumulative measure that counted, for each wave, current, and past reporting of grandchild care. This measure took the value of 0 for an individual's first observation and increased by 1 when an individual reported "any" grandchild care for two consecutive waves and more. Additionally, we considered a measure of grandchild care frequency, focusing on whether care was provided weekly or more. These measures did not increase when the individual transitioned out of "any" and "at least weekly" care, respectively, in the succeeding waves.

Following the methodology of Tattarini et al (2025), work-family life history clusters were obtained from SHARELIFE's Job Episodes Panel (JEP), using information on the respondent's employment situation, parenthood, and partnership status from age 15 to 49. At each age, individuals were classified into one of six employment states: "Working Full-time (FT)", "Working Part-time (PT)", "Unemployed", "Home or Family Work", "In Education", and "Other". Four family states were distinguished: "No Children, No Partner", "Children, No Partner", "No Children, Partner", and "Children, Partner".

Statistical methods

To identify work-family life history clusters, we employed multichannel sequence analysis (MCSQA), using individual trajectories of work and family states as the unit of analysis. Then, utilizing the resulting distance matrix, we performed hierarchical cluster analyses using Ward's linkage procedure. We executed

this clustering algorithm iteratively, evaluating each solution based on which best fits the data and our theoretical framing.

To examine cognitive changes associated with cumulative grandchild care, we estimated fixed-effects (FE) models with standard errors clustered on individuals. Full models controlled for age and its squared term, dummy variables for SHARE waves, currently living with a partner (0 = no, 1 = yes), ADL limitations (0 = none, 1 = have at least 1), and paid work status (0 = non-working, 1 = working). To investigate heterogeneities in the cognitive consequences of grandchild care, we conducted separate analyses according to the identified work-family life history. For ease of interpretation, predicted cognitive scores are shown graphically.

Preliminary findings

FE models reveal distinct patterns in how work-family life courses shape the cognitive changes associated with grandchild care (Figure 1). Among women, those with histories of stable partnerships and lifelong unpaid domestic work show temporary gains in memory recall after engaging in "any" and "at least weekly" grandchild care consecutively, but these advantages diminish with continued caregiving as adaptation processes set in, aligning their performance with other work-family clusters. However, these women exhibit the lowest verbal fluency, even as caregiving continues across waves. Among men, cognitive changes appear more uniform across work-family life courses. Only those with unstable work histories and later entry to fatherhood show improved memory recall from having engaged in "at least weekly" grandchild care consecutively, although subsequent caregiving brings no additional cognitive gains, suggesting adaptation rather than cumulative benefits.

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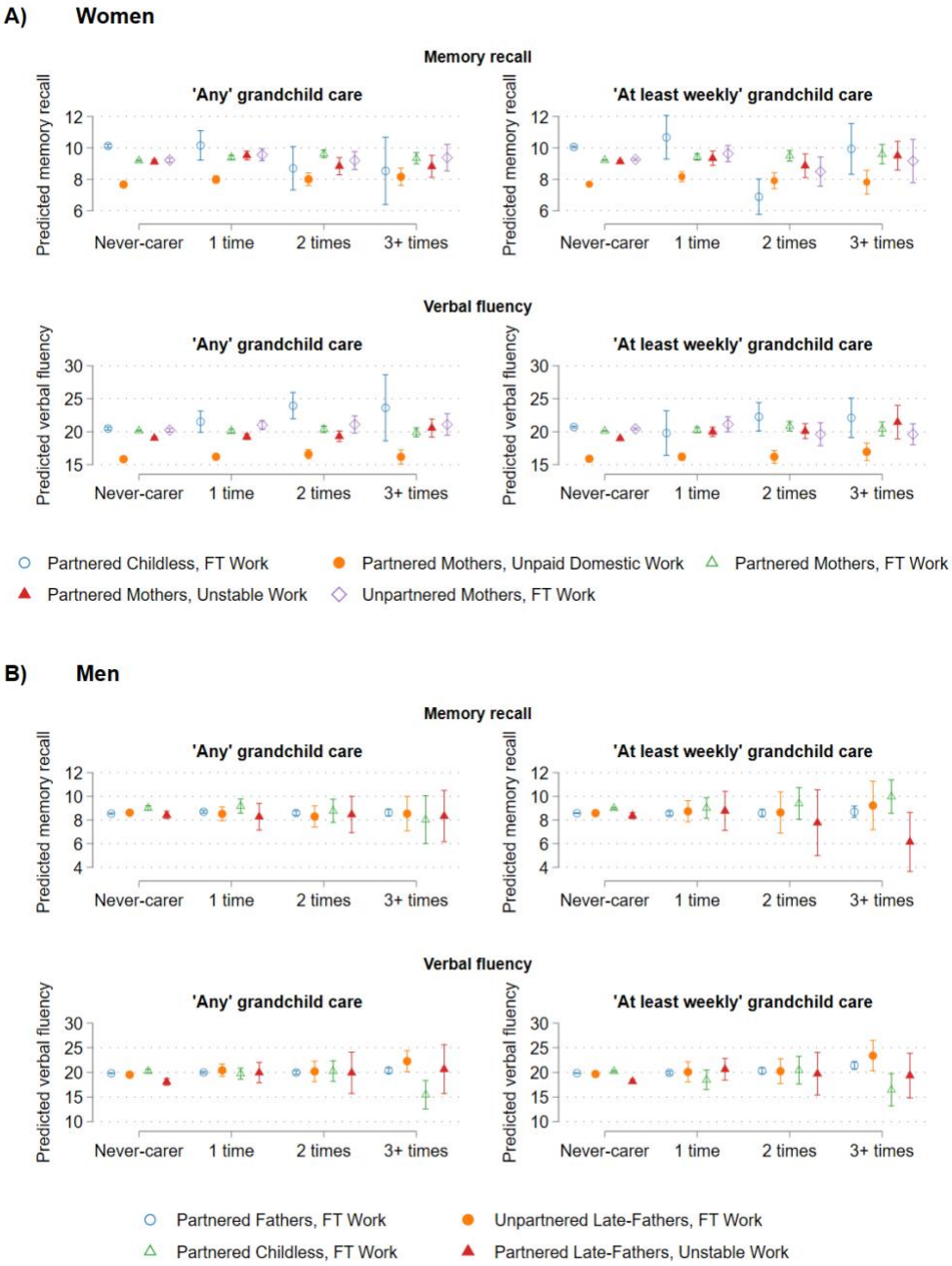

Figure 1. Predicted cognitive scores with 95% confidence intervals from fixed-effects (FE) regression models, by men and women's work-family life course clusters. Authors' own estimates.