Retirement and Cognitive Function in Later Life

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Abstract

In this systematic review, we synthesize the literature on the relationship between retirement and cognitive functioning and highlight dimensions of heterogeneity in the findings. Most studies find no effect or a negative effect of retirement on cognitive functioning and risk of cognitive impairment. Heterogeneity in the relationship is observed, most notably by sex and occupation, though differences also exist by education level and country context. A few studies find a positive effect of retirement on cognition among individuals employed in manual labor or skilled trades. We conclude our review by describing data infrastructure improvements and future research opportunities.

Keywords: retirement, cognition, pension, cognitive decline

JEL codes: I14, J14, J22, I24, J26

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Cognitive impairment is a leading cause of disability and mortality in high-income countries (Kochanek et al. 2024; World Health Organization 2020). It is also very costly for both family and friends, who provide the majority of care for people with self-care needs, and for governments, who pay for most of the necessary health care and a varying degree of long-term care services (Colello 2023; Gruber et al. 2023). While some declines in specific cognitive abilities are expected as individuals age (Harada et al. 2013), impairment exceeding what is typical can have profound adverse effects on many aspects of life, including management of finances (Han et al. 2015; Stewart et al. 2019; Nicholas et al. 2021) , medical treatment adherence (El-Saifi et al. 2018; Barthold et al. 2021), and the planning of sequential activities. Risk factors for cognitive impairment are numerous and include genetic predispositions, environmental exposures, physical and mental health conditions, and lifestyle factors (Livingston et al. 2020). Yet age remains the strongest predictor of cognitive impairment, and as the age distribution in high-income countries becomes increasingly weighted towards older adults, the number of people living with cognitive impairment in these countries and the associated costs are expected to surge (Nichols et al. 2022). Researchers and policymakers have consequently focused their attention on modifiable risk factors that may prevent, delay the onset of, or slow the progression of cognitive impairment. One such factor is the transition from work into retirement, and the age at which people make this transition.

Why Might Retirement Be Related to Cognitive Functioning?

Cognitive reserve is one theoretical framework for understanding a possible causal relationship between retirement and cognitive functioning. This framework posits that individuals differ in the vulnerability of their cognitive capabilities to underlying brain degeneration arising from aging, disease, or trauma (Stern et al. 2020). Vulnerability is determined by a combination of innate characteristics and the accumulation of lifetime exposures to intellectually, physically, and socially stimulating experiences that alter the flexibility and efficiency of an individual's cognitive processes (Stern et al. 2020). Some individuals with high cognitive reserve, for example, may have brain pathology indicative of Alzheimer's disease, yet exhibit normal cognitive functioning because the adaptability of their cognitive processes has allowed them to develop effective work arounds. Per the cognitive reserve framework, people's occupations, or more specifically the content and working conditions involved with their occupations, contribute significantly to their lifetime exposures, given the sheer amount of time people spend working (nearly one-third of the average person's waking hours in adulthood). Cognitive reserve theory suggests heterogeneity in the relationship between retirement and cognition based on the cognitive demands of jobs held prior to retirement.

A related theoretical framework, known as the broader cognitive enrichment theory or the 'use it or lose it' hypothesis, suggests that cognitive processes that are not exercised will degrade over time (Hultsch et al. 1999; Salthouse 2006; Hertzog et al. 2008). Consequently, regular intellectual, physical, and social stimulation are necessary to maintain cognitive health. Per this framework, the cessation of work may change the types and amounts of stimulation to which an individual is exposed regularly. For example, people with cognitively demanding jobs might find themselves with fewer opportunities in retirement to engage with cognitively challenging tasks. By contrast, people with tedious jobs might have more time available in retirement to participate in activities that they find intellectually and physically engaging. This framework highlights the heterogeneity in the effect of retirement based on people's cognitive tasks in both their working and retirement lives.

Individuals are also exposed through their occupations to environments and working conditions that may have a direct impact on their cognitive health. For example, metal workers and machinists may be exposed to heavy metals, which can accumulate in the brain with neurotoxic effects (Caito and Aschner 2015; Vasefi et al. 2020). Military service members are at particularly high risk of traumatic brain injury (Howard et al. 2022). Such injuries cause temporary or permanent impairments in cognitive functioning, and they also lead to a higher subsequent risk of dementia (Barnes et al. 2018).

Finally, working conditions may affect individuals physical and mental well-being, both of which are integral to cognitive health. It is estimated that more than one in five cases of dementia in the US and Europe are attributable to physical inactivity (Norton et al. 2014), and office-based jobs often involve extended periods of sitting throughout the day. Many individuals also have consistently atypical work schedules involving night shifts or long working hours. Atypical schedules are associated with sleep disturbances that are, in turn, risk factors for cognitive impairment (Leso et al. 2021). Work-related stress is also common and has been found to be associated with both physical and mental health outcomes, including depression, anxiety, and coronary heart disease, outcomes that are themselves associated with an increased risk of cognitive impairment and dementia (Jamal and Baba 2000; Restrepo and Lemos 2021).

Methodological Challenges

Accurately measuring the relationship between retirement and cognitive functioning is not a straightforward endeavor. Measures of retirement frequently miss the nuance of how and why people retire. Researchers also lack a standardized means of capturing cognitive function and impairment. Furthermore, hypothesized moderators and mediators of the relationship are often not available in datasets.

The pathways to retirement. People take different paths to retirement. Some carefully time and plan for this transition. For others, unanticipated events arise that alter their desire or ability to work. These opportunities could come from the employer, such as a "golden parachute," or a financial incentive to retire earlier than originally planned, or changing national policies, such as mandatory retirement ages, prevalent in Europe and parts of Asia. Another reason for deviating from one's retirement plan can be a change in the ability to work, due to health declines preventing continued employment (Slavov and Chung 2025), or increasing demands on one's time, such as loved ones who need time-intensive care (Gellert and Kolluri 2025), or a job loss and difficulty finding new employment. A third factor could be changing preferences, such as wanting to be an active grandparent, or a volunteer opportunity requiring relocation or substantial time commitment.

Just as the reasons behind the timing of retirement vary, the pathways to retirement vary too. People may stop working abruptly, gradually reduce their hours, or switch to a job with fewer hours or lower stress, often referred to as "bridge jobs" (Ruhm 1990). Nearly half of US retirees had a nontraditional retirement path from 1992-2002, with over a quarter returning to work (Maestas 2010). Such variety of pathways to retirement can make defining the moment of retirement or years spent in retirement difficult. Individuals themselves vary in how they answer the question in surveys, with some answering the last day of any paid work, while others say it is when they stepped down responsibilities. The pathway to retirement is usually intertwined with the reason behind retirement, making it near impossible to disentangle the effects of each.

For homemakers, it is especially hard to define the timing of retirement. This difficulty has led some researchers to limit their study of the relationship between retirement and health or cognition to men, who have historically higher and more consistent labor force participation rates than women and whose "end of the working life" is easier to define using paid labor market definitions. When studying the effect of retirement on women, one must keep in mind the selection into work and how that has changed over time as female labor market participation rates have increased.

Measuring cognitive functioning. Scientists offer several ways to assess cognitive functioning, each with its own strengths and weaknesses. To identify people whose cognitive impairment has become symptomatic, diagnosis codes for mild cognitive impairment (MCI) and Alzheimer's disease and related dementias (ADRD) in medical records and administrative data may be used. A primary strength of this approach is that diagnosis codes are collected as a routine part of health care delivery and thus they are available at the population level, facilitating population-based studies. Yet, both MCI and ADRD are underrecognized by physicians, so diagnosis codes tend to identify people with moderate to severe disease (Valcour et al. 2000; Chodosh et al. 2004; Bradford et al. 2009). The likelihood and timing of a diagnosis is also dependent on people's demographic and socioeconomic characteristics. For example, non-Hispanic Blacks and less educated individuals are more likely to have a missed or delayed diagnosis (Amjad et al. 2018; Gianattasio et al. 2019; White et al. 2022). Finally, receipt of a diagnosis is dependent on health care utilization, so individuals lacking access to care are likely to be missed.

Formal, in-person clinical assessments of cognitive functioning are another means of identifying individuals with symptomatic cognitive impairment. This approach often involves adjudication of diagnoses by a team of clinicians and is considered a gold standard for case identification. Nevertheless, this is also resource- and time-intensive, so the approach has generally been limited to smaller cohort studies (e.g., the Aging, Demographics, and Memory Study supplement to the Health and Retirement study) or to referral-based or volunteer case series (e.g., Alzheimer's Disease Research Center participants) (Langa et al. 2005; Rentería et al. 2023). Consequently, selection bias and sample size issues frequently hamper analyses using this approach.

A variety of shorter instruments has also been developed to assess cognitive performance or screen for cognitive impairment. These instruments are designed to be administered in person (some have been adapted for telephone administration) by trained lay people and are thus ideal for use in large population-based studies (Borkowski et al. 1967; Folstein et al. 1975). Yet because each instrument is differently scaled and uniquely captures performance on one or more cognitive domains (e.g., processing speed, attention, episodic memory, verbal fluency), comparability of scores across instruments is often difficult. Additionally, the screening instruments are designed to detect major deviations from normal cognitive functioning, so they exhibit little variation across individuals with no impairment. Ideally, these assessments should be administered repeatedly over time, to determine longitudinal trends in cognitive functioning. This is necessary for researchers to tease apart the direction of causality when studying the relationship between retirement and cognitive functioning.

Time use before and after retirement. The relationship between retirement and cognitive health, as highlighted by the theoretical frameworks, is complicated by what people do with their time, both before and after retirement, both in and out of employment. Jobs vary not only with their physical activity and schedules, but also in terms of their job strain and stress, psychological demands and mental stimulation, and people's degree of control over their daily tasks. In contrast, what people do after retirement is typically more of a choice and often cannot be observed in datasets that also capture cognition information. According to 2023 data from the American Time Use Survey, retirees between age 65 - 74 enjoy nearly seven hours of leisure time per day (US Bureau of Labor Statistics 2024). These data also suggest that, as people enter retirement, they increase sleeping hours and time spent on sports and leisure, although increases in caregiving are also apparent (US Bureau of Labor Statistics 2024). Television watching remains the dominant leisure activity for retirees and increases with age, on average. Such passive and solitary leisure activities could contribute to an effect of retirement on cognitive health.

Heterogeneity. Researchers frequently lack complete information on cognitive demands, both in professional and non-professional settings (e.g., social activities that stimulate cognitive processes), as people age. They also often lack information on people's plans or intentions to retire. This limits their ability to cleanly identify how retirement is linked to cognitive decline. Nevertheless, many of these determinants are correlated with observable characteristics such as sex, educational attainment, occupation, and industry, and these can be used in research studies to understand heterogeneity in the relationship between retirement and cognition. It is important to note that these are proxies for several potential underlying factors, making it difficult to link results to the factor itself. For example, the relationship between retirement and cognition has been found to differ based on sex (Atalay et al. 2019; Oi 2019); yet no biological underpinning has been identified. Quite possibly, it is based on sociological factors such as selection into work, cognitive demands, and activities before and after paid work.

Systematic Review

We conducted a systematic literature review to examine recent evidence on the association between retirement and cognitive function. Our goal was to examine the role of retirement in cognitive outcomes, and to highlight how occupational characteristics, pre- and post-retirement activities, and other factors may moderate or mediate outcomes.

Methods. Our search strategy included three categories of terms: terms for retirement *and* terms for cognitive function or decline *and* terms for study design. The search was carried out in four databases: PubMed, Embase, EconLit, and PsycINFO. Reference lists of included articles were also scanned for any additional matches. The full search strategies for each database are provided in Appendix Tables 1-4. Searches were executed in July 2024 with an updated search in March 2025, and 5,221 unique articles were identified for review.

Articles had to meet both of the following criteria to be included: (1) retirement is the primary exposure; and (2) primary outcomes include measures of cognitive function or decline (not including psychological health). We limited the search results to studies published in English, but did not include any geographic or publishing date restrictions. Qualitative studies, review articles, conference abstracts, and commentaries were excluded.

Two authors independently reviewed the titles and abstracts of all identified articles for our inclusion and exclusion criteria. In the case of any disagreements, the third author made a final decision. After title and abstract review, 85 studies were identified for a full text review. Following a full text assessment, 62 articles met all criteria and were included in the review. Common reasons for exclusion included: wrong outcomes, wrong exposure, or general irrelevance (e.g., many studies used datasets like the Health and Retirement Study, but did not focus on retirement). Appendix Figure 1 displays a flow chart of the search and review process.

Two authors assessed each study's risk of bias. We classified each study's risk of bias as low, medium, or high. A principal concern when evaluating risk of bias in this topic is to evaluate how the study design and analytic methods addressed the endogeneity of retirement and health—that is to say, whether the methods accounted for the potential for poor health or cognitive function to influence the retirement decision, rather than be caused by it. Low risk of bias studies employed rigorous causal inference designs (e.g., instrumental variables) with adequate controls, whereas high risk studies were descriptive with minimal controls in regression or substantial data missingness. Articles with medium risk of bias fell in between, using a robust set of controls, methods that help to ensure comparability between the "treatment" and "control" groups (e.g., propensity scores), or certain causal designs that either lacked important controls or utilized potentially invalid instruments leading to biased estimates. When drawing conclusions across papers below, we emphasize results from studies with a low risk of bias.

Results: study characteristics. Table 1 describes each study's characteristics, major findings, and risk of bias. Researchers vary in how they evaluated the effect of retirement. Almost half of the studies only used the transition into retirement as the exposure (29 studies), while the other half considered the impact of timing or duration of retirement (33 studies), sometimes in addition to the initial retirement transition. Additionally, the measure of cognitive function differed across studies. Fifty-five studies used assessments of memory, executive function, verbal fluency and numeracy, and/or information processing speed. This is because most studies used longitudinal survey data and took advantage of cognitive exams administered to participants across waves. It is important to note that even among these assessments, there was substantial variation in the domains of cognition examined and the test used. Studies also differed in whether they chose to study a one-time change in cognitive function, or the pre- and post-retirement rate of cognitive decline. In addition, six studies used a diagnosis of cognitive impairment, dementia or Alzheimer's disease as an outcome, and one used self-reported cognitive problems. Analysis methods also differed: five studies were cross-sectional, 34 studies used longitudinal data, and 23 studies used quasi-experimental methods (18 studies used instrumental variables, three used regression discontinuity, one used both instrumental variables and regression discontinuity, and one used difference-in-differences). For the instrumental variable and regression discontinuity analyses, nineteen studies used pension eligibility ages as an instrument, four used mandatory retirement age policies, one used offers of early retirement windows, and one used a law banning women from the workforce upon marriage. Based on analysis methods, we determined that 13, 36, and 13 articles had a low, medium, and high risk of bias, respectively.

Study settings and populations also differed. Almost all studies examined populations in the US and Western Europe. Most studies were national (39) or international (14), but some (nine) were constrained to smaller regions of a country. Additionally, though many studies included a broad population, seven studies included only males, two studies looked exclusively at women, and four studies focused on one occupation group.

Seventeen studies assessed the relationship between occupation type or characteristics and cognitive function. The most common job characteristics studied were control, demands, physical burden, and complexity. Five studies evaluated how cognitive outcomes differ by the retirement pathway (e.g., comparing individuals who retired fully versus those who continued to hold a part-time job or later returned to work).

Table 1 here

Results: study findings. Across studies, results were quite mixed. When retirement was treated as a single exposure, 16 studies found a significant reduction in cognitive function following retirement, 15 studies found no significant effect of retirement on cognition, and 6 studies reported that retirement was associated with improved cognition. When retirement was assessed as a continuous treatment with effects that accumulate over time, results were much more consistent. 28 studies found that delaying retirement was associated with cognitive benefits or that longer retirement periods were associated with greater cognitive decline, whereas four studies found no significant relationship between retirement timing or duration and cognition. Two studies found that delaying retirement was associated with poorer cognitive function. Oftentimes, once controls for education, sex, or age were added, the magnitude of any observed associations decreased.

Rohwedder and Willis (2010) were among the first researchers to employ a quasi-experimental design with cross-sectional data to examine the causal impact of retirement on cognitive health. They used pension eligibility ages in Europe and the US for an instrumental variable analysis. They found a large, immediate decline in memory due to retirement among individuals who retired due to reaching their pension eligibility age. However, they did not control for education, which was responsible for a large negative bias in their effects (Bingley and Martinello 2013; Jung et al. 2022).

Since this study was published, many other researchers have iterated on their methodology. Coe and Zamarro (2011) also used cross-sectional data and international variation in pension policies as an instrument, though only in Europe. They controlled for education and family structure and excluded participants with certain health conditions. This study documented no significant effect of retirement on cognitive function. Mazzonna and Peracchi (2012) also used pension eligibility ages across Europe for an instrumental variable analysis, though they leveraged within-country variation in pension legislature and included two waves of data. They additionally accounted for attrition in their sample and retesting effects (i.e., how participants learned from their experience completing cognitive assessments in previous waves). In their analysis, retirement increased the rate of cognitive decline.

These three studies evaluated retirement as a single exposure without allowing for the effect of retirement on cognitive function to change over time. Other work has considered the possible dose-dependent effects of retirement. For example, Mazzonna and Peracchi (2017) used similar methods to their previous study but with a different specification of retirement allowing examination of both immediate and long-term effects of retirement. Their study showed that for those who retired from very physically demanding jobs, retirement resulted in an immediate increase in cognitive score by half a standard deviation. Nevertheless, each year spent in retirement decreased cognitive abilities by six percent of a standard deviation for all retirees.

Coe et al. (2012) also found retirement length improved cognition for blue-collar workers when using “golden parachute” early retirement offers in the US as an instrument; they found no significant effect of retirement length on cognition for white-collar workers. Importantly, this study differed from all other quasi-experimental analyses on this topic in the authors’ use of a two-stage residual inclusion estimator, shifting the interpretation of the results to an average treatment effect. That is, the results should apply to the general population, rather than just those who retired because of an early retirement offer.

Bonsang et al. (2012) used early and full US Social Security eligibility ages as an instrument and used a fixed-effect estimator to control for individual heterogeneity— including education, sex, and occupation. They found retirement due to the Social Security incentives decreased cognitive functioning, with most of the decline occurring shortly after retirement, rather than after an extended period. Results from studies in the US that use the full retirement eligibility age (65 years old at the time) as an instrument should be viewed with caution, as

Medicare eligibility and subsequent health care utilization may drive effects on cognition rather than retirement itself. Fé (2021) found smaller, insignificant decreases in cognition after retirement when only the early Social Security eligibility age was used as an instrument.

Some studies examined heterogeneity in the effects of retirement on cognitive function. One question has been whether characteristics of the occupation one holds prior to retirement, particularly its physical and mental demands, influence post-retirement cognitive trends. Kajitani et al. (2017), using pension eligibility ages and mandatory retirement policies for men in Japan as an instrument, showed that more complex careers, especially ones involving data manipulation, were protective against post-retirement decline. Similarly, from the correlational strand of literature, Fisher et al. (2014) found that pre-retirement occupations characterized by greater mental demands were associated with slower post-retirement cognitive decline in the US. In contrast to previous findings from Coe et al. (2012) and Mazzonna and Peracchi (2017), Romero Starke et al. (2019) observed that retiring from lower-class occupations (often involving greater physical demands) was associated with greater post-retirement decline compared to other occupational classes in England. Nevertheless, correlational studies fail to account for how health drives retirement. Romero Starke et al. (2019) may not effectively account for poorer health at baseline among lower-class workers that drives them to retire.

As noted earlier, education is an important factor in determining the role of retirement in cognitive function. Ebeid and Oguzoglu (2023), using a variation of regression discontinuity, showed that low-education retirees experienced more than double the cognitive decline compared to high-educated retirees in the US. They used the full Social Security eligibility age, but their model specification avoided bias from Medicare eligibility. Comparably, de Grip et al. (2015) using longitudinal data from the Netherlands and controlling for individual heterogeneity found that less-educated individuals experienced a significantly greater decline in cognition after retirement compared with highly educated individuals. In contrast, Peng et al. (2022) used a cross-sectional design with propensity score matching and observed that in China, retirement was associated with improved cognition in low-educated people; individuals with greater education did not experience significant effects. Nevertheless, disaggregating results by education may partially reflect the pre-retirement job characteristics of individuals of varying education levels, rather than the true role of education in the relationship between retirement and cognitive decline.

Mizuochi and Raymo (2022) conducted the only quasi-experimental study to examine how different retirement pathways affected cognitive function. Using pension eligibility ages and mandatory retirement policies for Japanese workers in an instrumental variable analysis, they observed that the only retirement pathway leading to worsened cognitive function was staying with the same employer after partial retirement. Full retirement, or partially retiring but working with a new employer, were not related to cognitive function. This work serves as reminder that although researchers can capitalize on exogenous shocks to retirement behavior, individuals sort into retirement pathways and post-retirement activities non-randomly. For example, in Japan, partial retirement with the same employer is often the result of financial need, which may bias the estimate of the causal relationship.

More evidence on the importance of retirement pathways and time use after retirement comes from the correlational literature. Carr et al. (2020) reported that returning to work after retirement was associated with reduced post-retirement decline compared to fully retiring. In contrast, partial retirement was not associated with significantly different cognitive outcomes than full retirement. In addition, Lee et al. (2019) used path analysis to demonstrate that greater involvement in mental leisure activities, like reading or making art, ameliorated the negative association between retirement and cognition for US older adults.

Additionally, the effect of retirement may differ by country based on demographics and cultural and political contexts. For example, Nishimura et al. (2018) replicated previous analyses while altering study design choices one at a time, including the country studied. Significant effects of retirement on cognitive function were only reported in South Korea and the US, and retirement-induced cognitive decline for Korean men was nearly 70 percent greater than that of American men. Kim et al. (2018), using matched difference-in-differences, observed a similar pattern when studying the US and Korea. Additionally, Mäcken et al. (2021) compared cognitive trajectories before and after retirement in 17 European countries and found significant heterogeneity, with faster post-retirement declines observed in Mediterranean and Eastern European countries. Underlying mechanisms have yet to be explored, whether they are sociological differences, like time use before and after retirement, or biological differences.

Finally, some studies have explored differences for men versus women. Using the Australian pension eligibility age as an instrument, Atalay et al. (2019) found that men induced to retire by their pension age experienced a larger immediate decline in cognitive function compared to women, and each additional year of retirement led to further declines in cognition for men only. They also observed that women increased their household activities and club membership upon retiring, whereas men decreased their mental activities, which may explain the difference in cognitive trajectories. Similarly, Dufouil et al. (2014) reported that, for French craftworkers and shopkeepers, delaying retirement was associated with delays in dementia diagnosis, and that the relationship was stronger for men than women. Despite this, some studies find that associations between retirement and cognition do not differ by sex, or that women experience worsened cognition after retirement. Lei and Liu (2018), using differential enforcement of Chinese mandatory retirement policies as an instrument, observed that men, especially those who worked in blue-collar jobs, benefited from retirement because they pursue a more active lifestyle after retiring. In contrast, they reported that women experienced reductions in cognition. But, women are subject to mandatory retirement earlier than men, so it is not possible to separate the heterogeneity by sex from the effects of age. In addition, Hale et al. (2021) used a g-formula approach and showed that delaying retirement was associated with similar cognitive benefits for US men and women, while Mazzonna and Peracchi (2012) observed that only low-educated women experienced drops in cognition after retirement, whereas women with more education and men did not.

Discussion

This paper has reviewed two bodies of research measuring the relationship between retirement and cognitive functioning. One strand, mostly in economics, tries to provide empirical evidence of the causal effect of retirement on cognitive functioning, relying on quasi-experimental approaches to address reverse causation (i.e., declining cognitive functioning inducing retirement). Despite this, earlier literature still suffered from omitted variable bias. Using increasingly refined methods, recent literature suggests that initial estimates of retirement's effects on cognition were overstated. Retirement likely has only a modest negative effect or no effect for those individuals who retire due to financial incentives in their pension plans. Effects seem to accumulate over time, rather than retirement solely inducing an immediate change in cognitive function. Studies also documented important heterogeneity based on sex, education level, the physical and cognitive demands of the occupation individuals retire from, and the country setting. Men and individuals with less education seemed to experience greater cognitive decline due to retirement (Lei and Liu 2018; Nishimura et al. 2018; Atalay et al. 2019; Ebeid and Oguzoglu 2023; Kim et al. 2023). Regarding occupation, several studies found that people retiring from blue-collar jobs or jobs involving physical labor actually benefited from retirement (Coe et al. 2012; Mazzonna and Peracchi 2017; Lei and Liu 2018). Even when researchers used the same statistical techniques and selection criteria, results also differed based on the country studied.

The second set of studies we reviewed mainly used longitudinal data to capture cognitive functioning before and after the transition into retirement. Findings were less consistent than the quasi-experimental literature. Still, they were likely to report that delaying retirement was associated with protection against cognitive decline, and that longer retirement periods were associated with worsened cognition. This literature explored heterogeneity in the association based on sex, occupational characteristics, and retirement pathway. These studies were more likely to disagree about the presence of heterogeneity and the direction of the associations. Additionally, although researchers have little information on time use after retirement, it appears that partial retirement, returning to work after retirement, or post-retirement engagement in other activities like reading or art may be protective against cognitive decline (Lee et al. 2019; Carr et al. 2020; Carmel and Tur-Sinai 2022). Importantly, correlational studies were unable to rule out the possibility that changes in cognitive functioning prior to retirement drove their results.

Both sets of studies provide some evidence regarding the theoretical cognitive frameworks sketched at the outset. The ‘use it or lose it’ hypothesis suggests that retirement is likely to be detrimental to cognition unless work activities are adequately replaced by cognitively demanding activities in retirement. Under the common assumption that activities in retirement are inadequate in replacing the cognitive demands of work activities, all the studies that found a significant reduction in cognitive function following retirement were consistent with the ‘use it or lose it’ hypothesis. Yet only the four studies that examined time use after retirement provide explicit evidence. All four found that greater engagement in stimulating activities during retirement were associated with better cognitive functioning (Ihle et al. 2016; Lei and Liu 2018; Atalay et al. 2019; Lee et al. 2019).

Alternatively, the cognitive reserve framework posits that education and cognitively demanding occupations help people build higher cognitive reserve or increased cognitive adaptability. According to this framework, highly educated individuals and those in cognitively demanding occupations are expected to be better protected from cognitive decline in retirement, exhibiting either slower rates of decline in cognitive functioning or a lower risk of mild cognitive impairment or dementia. Findings from nine studies were consistent with these hypotheses, with five linking slower cognitive decline in retirement to occupations involving greater mental complexity and the other four to greater educational attainment (Mazzonna and Peracchi 2012; Fischer et al. 2014; de Grip et al. 2015; Kajitani et al. 2017; Romero Starke et al. 2019; Carr et al. 2020; Oi 2020; Carmel and Tur-Sinai 2022; Ebeid and Oguzoglu 2023). Yet three studies, all from the correlational literature, found no differences in cognitive functioning trajectories post-retirement based on occupation type (Wickrama and O’Neal 2013; Xue et al. 2018; Baumann et al. 2022). Without granular information on occupational activities and data on underlying brain physiology, studies have been unable to provide direct evidence to support or refute the cognitive reserve framework.

The most robust evidence to date of a causal relationship between retirement and cognitive functioning still has limitations. Most instrumental variable analysis provides precise estimates for those whose retirement behavior changes due to the instrumental variable, but it is silent on the effect of retirement for other reasons. All but four of the quasi-experimental studies used social security policies, specifically the age of eligibility for pension benefits, as an instrument, meaning most estimates relate to those whose retirement was induced by their government social security systems. The pension-based estimates may be extremely informative for policymakers considering social security reforms, but they do not reflect the retirement pathways for most individuals. The percent of individuals claiming US Social Security benefits and ending employment at age 62 has been declining over time (Waldron 2020), with less than one-third of new benefit claims occurring at age 62 (Li 2023). As the financial gain from delaying benefits becomes closer to actuarially fair, decreasing the incentive to retirement at specific pension eligibility ages, this source of variation becomes less reliable for identification or informative for policy makers. Nevertheless, gradual increases in the full retirement age from 65 to 67 may provide an opportunity for researchers to study the effects of retirement at these later ages without bias from Medicare eligibility.

Studies using mandatory retirement policies in China and Japan estimate the effect of potentially involuntary retirement, which may have very different implications for health and wellbeing. In Japan, employers may set mandatory retirement policies for any age above 60 years, and must offer continued employment opportunities (e.g., part-time work) until age 65, when pension benefits begin. In China, retirement at the pension eligibility age is mandatory, though enforcement across sectors varies. The retirement age ranges from 50 to 60 depending on one's sex and occupation. The population of people who retire due to these design features, and the opportunities available to them after retirement, may look vastly different than those who retire due to pension eligibility in the US and Europe. As such, we may expect results from these two sets of studies to differ, though there is only one study in our review that isolates the mandatory retirement instrument from pension eligibility (Lei and Liu 2018).

An additional limitation of the existing literature pertains to the cognitive metrics that are commonly used. Scores on one or more cognitive assessments, while valid and important, are only proxies for the welfare loss due to cognitive changes. Additional work is needed to link the causal impact of retirement with measures of symptomatic cognitive impairment and cognitive decline.

New Opportunities

To fully understand the causal relationship between retirement and cognition, one would need a comprehensive longitudinal dataset, with information on retirement plans, retirement behavior and timing, cognitive demands of work and leisure activities, and reliable cognitive data that links closely with changes in well-being and lifestyle. In addition, researchers would need to understand the reasons behind one's retirement, whether induced by personal circumstances or retirement policies. While we still do not have such granular data available, there have been vast improvements in data availability through measurement improvement, data expansion and harmonization, and linkages between data sources.

Measurement improvement: cognitive function/dementia. There has been widespread improvement and inclusion of more nuanced measures of cognitive function. The Harmonized Cognitive Assessment Protocol (HCAP), a battery of tests that measures cognitive function in older people, has been included in several longitudinal and international studies, allowing for comparisons of cognitive function and dementia risk over time and across countries. Chile, China, England, India, Mexico, South Africa, and the United States all have HCAP surveys in place; planned HCAP studies include: Dominican Republic, Denmark, Czech Republic, Germany, France, Italy, Ireland, Lebanon, Nepal, Northern Ireland, and Puerto Rico (National Institute on Aging 2025). This innovation and standardization will help resolve the fundamental concern of reverse causality, of heath and cognition influencing retirement timing, and retirement itself influencing health and cognition.

Measurement improvement: employment/retirement. Most surveys rely on self-reported measures of retirement which are subject to respondent interpretation and inconsistently answered. The Health and Retirement Study remains one of the few studies that link to administrative earnings information from the Social Security Administration, reliably capturing complete formal paid work history since 1951.

Dementia cohort studies are increasingly able to help address this research question, as they often have unparalleled information on cognition, adjudicated dementia diagnoses from a panel of experts, and increasingly, biomarker and neuroimaging data which can help measure the biological vs. symptomatic cognitive health. Given the importance of lifetime risk factors for dementia, many are adding sociodemographic information as well as life and work histories, allowing for further detangling of the roles played by work and retirement in cognitive decline. Significant efforts to improve the representativeness dementia cohorts are ongoing, which will improve the ability to measure heterogeneous relationships and improve generalizability of findings from these cohorts. Further, therapies are underway for individuals in the pre-clinical stages of Alzheimer's disease, and efforts to decrease the age of enrollment will boost the likelihood of observing retirement behavior while in the cohort instead of relying on self-reported retrospective data.

Data access and harmonization. There are numerous international aging studies that could lend their data to help address this, and other, timely research questions. The Health and Retirement Study and its sister surveys continue to grow, providing harmonized information about aging and health around the world. Starting in the US in 1992, the family has now grown to over 35 countries around the world (Gateway to Global Aging 2025). The ARC Centre of Excellence in Population Ageing Research (CEPAR), based at the University of New South Wales, has aggregated aging surveys from around the world (CEPAR 2025).

Agencies are working to increase access and comparisons across dementia cohort studies to better leverage data investments. The NIA-funded Alzheimer's Disease Research Centers (ADRC) cohorts have been using Uniform Dataset Protocol (UDS) and the National Coordinating Center (NACC) to increase access and comparability across measures (CEPAR 2025). The Alzheimer's Association has put together the Global Alzheimer's Association Interactive Network (GAAIN), which allows researchers to search and aggregate among 70 different data partners from across the world (with a strong representation of the US and European countries). The Connecting Cohorts to Diminish Alzheimer's Disease (CONCORD-AD) collaboration network was created to bring together global resources and expertise, to generate insights and improve understanding of the natural history of AD, to inform design of clinical trials in all disease stages, and to plan for optimal patient access to disease-modifying therapies once they become available. The network brings together expertise and data insights from seven cohorts across Australia, Europe, and North America. Notably, the network includes populations recruited through memory clinics as well as population-based cohorts, representing observations from individuals across the AD spectrum. Table 2 summarizes key characteristics of these families of datasets.

Table 2 here

Data linkages. Finally, while still lagging Nordic countries, there are new opportunities to link US datasets in various settings. For example, the NIH has created the LINKAGES program, which allows researchers to link their own data with administrative claims data from the Centers for Medicare and Medicaid (CMS) to gain access to information on dementia and cognitive impairment diagnoses. As cognitive screening becomes more widespread, such as through the Medicare Annual Wellness Visit, cognitive information could be more readily available through electronic medical records and more reliably translated into diagnosis codes. The 34 Federal Statistics Research Data Centers (FSRDC), hosted by the Census Division, hosts a wide variety of national and nationally representative data that are linkable in secure computing environments, which would allow researchers to link administrative or survey data from a wealth of sources to create the dataset needed. The Internal Revenue Service Databank, a large, anonymized database of tax records that is used in economic research, could be linked to health or cognition data.

Conclusion

There continues to be great interest in exploring the causal linkage between cognition and retirement. Our chapter concludes that evidence on the relationship between retirement and cognition tends to support the 'use it or lose it' hypothesis, meaning that retirement tends to lead to declines in cognitive health for the average older adult. There is also some support for the cognitive reserve hypothesis, though it is not as consistent. Heterogeneity was observed by occupation, sex, education, and country context. Policymakers should consider the future cognitive health of their populations when designing and reforming pension systems. For instance, raising the eligibility age for retirement benefits would reduce the number of payments to retirees, increasing financial solvency. This reform would also encourage people to extend their working lives, which would yield macroeconomic benefits (Park and Shin 2025) and support cognitive health for the average older adult.

Nevertheless, we do not know whether the current estimates of the relationship between retirement and cognition will hold for all people or for retirement at all ages. While the US has already increased the full retirement age beyond 65, the literature has yet to catch up, and pushing retirement incentives to even older ages could have different effects than those studied to date. The relationship between retirement and health is particularly opaque for women, whose labor force participation rates, wages, and primary earner prevalence has transformed in recent decades, potentially making existing estimates unreliable for future cohorts. This uncertainty in the relationship between retirement and cognitive health could lead to the desire to have more flexible retirement policies where individuals could make decisions based on their personal situation rather than the financial incentives in place to retire at specific ages. Policy in the US is already moving in this direction, with more actuarially fair adjustments for retirement at different ages.

A cultural shift in our thinking about work and retirement could better support cognition as people age. The typical conceptualization of young adult and mid-life as a time to prioritize and dedicate oneself to work followed by retirement to a life of leisure may be detrimental to cognitive well-being. Rather, we should be thinking about meaningful participation in activities that nurture cognition throughout the life course to help extend one's healthspan (Utkus and Mitchell 2025). Investing in one's cognitive health early on could also aid them in making sound financial retirement decisions (Atshan et al. 2025). Policymakers, communities, and individuals could focus on building opportunities for physical, cognitive, and social engagement, both in and outside of employment, at all ages to support our cognitive, physical, and financial health.

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World Health Organization (WHO, 2020). *News Release: WHO Reveals Leading Causes of Death and Disability Worldwide: 2000–2019*. Geneva, CHE: WHO.

Xu, H., Z. Zhang, X. Yang, Q. Yang, and T. Chen (2025). 'Effects of Extended Working Lives on Depressive Symptoms, Physical, and Cognitive Health in Middle and Later Life: Evidence from China.' *Social Science & Medicine*, 369: 117833.

Xue, B., D. Cadar, M. Fleischmann, S. Stansfeld, E. Carr, M. Kivimäki, A. McMunn, and J. Head. (2018). 'Effect of Retirement on Cognitive Function: The Whitehall II Cohort Study.' *European Journal of Epidemiology*, 33(10): 989–1001.

Xue, B., M. Pai, and M. Luo (2022). 'Working beyond SPA and the Trajectories of Cognitive and Mental Health of UK Pensioners: Do Gender, Choice, and Occupational Status Matter?' *European Journal of Ageing*, 19(3): 423–436.

Zotcheva, E., B. H. Strand, C. E. Bowen, B. Bratsberg, A. Jugessur, B. L. Engdahl, … V. Skirbekk (2023). 'Retirement Age and Disability Status as Pathways to Later-Life Cognitive Impairment: Evidence from the Norwegian HUNT Study Linked with Norwegian Population Registers.' *International Journal of Geriatric Psychiatry*, 38(7): e5967.

Table 1: Studies included in literature review

Citation	Study Design	Population/Setting /Time Period	Selection criteria	Outcomes	Results	Risk of Bias
Atalay, K., Barrett, G. F., & Staneva, A. (2019). The effect of retirement on elderly cognitive functioning. Journal of health economics, 66, 37–53. https://doi.org/10.1016/j.jhealeco.2019.04.006	Longitudinal IV (2SLS) - pension eligibility age	Aged 55-70 at baseline / Australia / 2012-2016	Exclusion: missing study variables	Information processing speed, word reading test, and working memory	OLS models estimate that retirement is significantly associated with decreases in reading test performance by 0.058 SD (.062 SD) for women (men). Retirement was not associated with working memory or information processing speed. Each additional year in retirement is significantly associated with a 0.041 SD reduction in men's working memory. IV models estimate that retirement decreases men's reading test performance by 0.378 SD, but there are no significant effects for women.	Low
Bianchini, L., & Borella, M. (2016). Retirement and memory in Europe. Ageing & Society, 36(7), 1434–1458. https://doi.org/10.1017/S0144686X15000434	Longitudinal IV (2SLS) - early and full pension eligibility ages	Aged 50-70 / Europe / 2004-2012	Inclusion: working at age 50. Exclusion: sick, homemakers, returned to work	Total word recall	IV results suggest no significant, immediate impact of retirement on word recall. When the exposure is changed to having spent at least one year in retirement, the model estimates that being retired for at least one year causes a marginally significant increase of 0.6 words per year. Each additional year of retirement is associated with a significant increase of 0.3 words recalled than when they were working.	Low

Bingley, P., & Martinello, A. (2013). Mental retirement and schooling. European Economic Review, 63, 292–298. https://doi.org/10.1016/j.euroecorev.2013.01.004	Cross-sectional IV (2SLS) - early and full pension eligibility ages	Aged 60-64 / US, Europe / 2004	No selection criteria described	Total word recall	Before accounting for education, retirement leads to a significant decrease of 5.60 points in word recall. After controlling for education, the effect of retirement shrinks to a significant reduction of 3.01 points in word recall.	Low
Celidoni, M., Dal Bianco, C., & Weber, G. (2017). Retirement and cognitive decline. A longitudinal analysis using SHARE data. Journal of Health Economics, 56, 113–125. https://doi.org/10.1016/j.jhealeco.2017.09.003	Longitudinal IV (2SLS) - early and full pension eligibility ages	Aged 50+ / Europe / 2004-2011	Inclusion: started in wave 1/2, reinterviewed in wave 3/4 Exclusion: proxy interviews	High (> 20%) decrease in total word recall	For early retirees, retirement significantly decreases the immediate odds of a high decline in word recall by 18 percent. For statutory-age retirees, retirement insignificantly increases the immediate odds of a high decline, and causes a significant cumulative increase in cognitive decline. A long period in retirement is associated with experiencing high declines in cognition.	Low
Coe, N. B., & Zamarro, G. (2011). Retirement effects on health in Europe. Journal of Health Economics, 30(1), 77–86. https://doi.org/10.1016/j.jhealeco.2010.11.002	Cross-sectional IV (2SLS) - early and full pension eligibility ages	Males aged 50-69 / Europe / 2004	Exclusion: Parkinson's, brain cancer, a vascular incident, taking medication for depression, psychiatric hospitalization, never worked, not worked since age 50, incomplete survey records	Total word recall, verbal fluency	There was a significant negative correlation between retirement and cognitive function. However, after controlling for endogeneity of the retirement decision, the relationship is no longer significant. Therefore, this study finds no causal relationship between work status and cognitive decline.	Low

Coe, N. B., von Gaudecker, H. M., Lindeboom, M., & Maurer, J. (2012). The effect of retirement on cognitive functioning. Health economics, 21(8), 913–927. https://doi.org/10.1002/hec.1771	Pooled cross-sectional IV (2SRI) - offers of early retirement windows	Males aged 50+ / US / 1996-2008	Inclusion: first two HRS cohorts Exclusion: aged 80+ in a given wave	Self-rated memory; immediate, delayed and total word recall; working memory; and numeracy	OLS estimates for white-collar workers show a significant decline for all memory categories except working memory with greater years worked. For example, an additional year spent in retirement is associated with an average reduction of .0188 correctly recalled words (out of 10). For blue-collar workers, OLS only found significant decreases for self-rated memory and working memory. However, for the IV models, there were no significant relationships between retirement and memory for white-collar workers, and significant positive relationships for blue-collar workers (an increase of 0.155, 0.151, 0.298, and 0.132 points for immediate, delayed, total, and working memory, respectively).	Low

Ebeid, M., & Oguzoglu, U. (2023). Short-term effect of retirement on health: Evidence from nonparametric fuzzy regression discontinuity design. Health Economics, 32(6), 1323–1343. https://doi.org/10.1002/hec.4669	Longitudinal Fuzzy RDD (2SLS) - full pension eligibility age	Aged 50-75 / US / 1994-2014	Inclusion: HRS cohorts through 2010, five years work experience Exclusion: AHEAD Study born before 1924, returned to work, not working due to disability, homemaker, retired at 62, missing retirement data	Total word recall	The unadjusted model estimates that retirement causes a decrease of 0.814 points in total word recall (equivalent to an approximately 8% decline). When covariates are included, the retirement leads to a 0.728-point drop in total recall. Retired females experience a reduction in cognitive ability by about 0.794 points, corresponding to a 7.1% score decrease. The effect of retirement on males' total word recall is 1.010 points, which corresponds to a 10.18% score decrease. Less-educated retirees experience a 1.667-point total word recall reduction compared with a 0.749-point drop in the cognitive score of high-educated retirees (equivalent to 18% and 6.4% declines, respectively). However, this estimate is sensitive to change in the selected bandwidths.	Low

Fé, E. (2021). Pension Eligibility Rules and the Local Causal Effect of Retirement on Cognitive Functioning. Journal of the Royal Statistical Society Series A: Statistics in Society, 184(3), 812–841. https://doi.org/10.1111/rssa.12683	Cross-sectional fuzzy RDD (2SLS) - early pension eligibility age	Men aged 50-75 at baseline / US / 2012-2013	Exclusion: never worked, returned to work	Total word recall	The point estimate for LATE suggests that retirement insignificantly decreases total word recall by 0.58 s.d. (1.7 points, or 8.6%). When the author allows for a failure in the exclusion restriction, average drops in total word recall beyond 8% are unlikely. Improvements in the word recall following retirement of up to 16% cannot be ruled out.	Low
Kajitani, S., Sakata, K., & Mckenzie, C. (2017). Occupation, retirement and cognitive functioning. Ageing and Society, 37(8), 1568–1596. https://doi.org/10.1017/S0144686X16000465	Pooled cross-sectional IV (2SLS) - pension eligibility age and mandatory retirement policies	Men aged 60+ / Japan / 1987-2002	Exclusion: proxy interview, retirement duration outliers	Memory questionnaire	Increasing time spent in retirement leads to decreases in cognitive function. This effect is reduced for careers involving complex data tasks. Interaction terms of eight job characteristics with duration of retirement are marginally significant, and except for physical demand, have positive coefficients, indicating that complex jobs lead to slower post-retirement decline.	Low
Mazzonna, F., & Peracchi, F. (2017). Unhealthy Retirement? Journal of Human Resources, 52(1), 128–151. https://doi.org/10.3368/jhr.52.1.0914-6627R1	Longitudinal IV (2SLS) - early and full pension eligibility ages	Aged 50-70 at baseline / Europe / 2004-2006	Inclusion: data on past employment status; in the labor force at age 50; classified themselves as employed, unemployed or retired, data	Cognitive score (numeracy, immediate and delayed word recall, verbal fluency)	Each year in retirement significantly decreases cognitive score by 6 percent of a S.D. Retirement corresponds to an immediate significant increase of about 1/2 of an S.D. for the cognitive score for those employed in physically demanding jobs. For jobs at all	Low

			from both waves		levels of physical burden, time spent in retirement corresponded to a significant decrease in the cognitive score of 4.7-7.4% of a S.D. per year.	
Mizuochi, M., & Raymo, J. M. (2022). Retirement Type and Cognitive Functioning in Japan. The journals of gerontology. Series B, Psychological sciences and social sciences, 77(4), 759–768. https://doi.org/10.1093/geronb/gbab187	Pooled cross-sectional IV (2SLS) - full pension eligibility age, and mandatory retirement	Aged 50-76 / Japan / 2007-2013	Inclusion: worked full-time at age 54, was in one of the first three study areas. Exclusion: proxy interviews, left job the year before the survey, missing work status or outcomes	Cognitive score (immediate and delayed word recall, numeracy, and orientation)	Using the cognitive score from principal component analysis, IV models estimate partial retirement to decrease cognitive score by 0.46 S.D. Partial retirement with the same employer decreases cognitive score by 0.47 S.D., while partial retirement with a different employer or full retirement have no significant effect. Using the raw cognitive score, partial retirement with the same employer decreases cognitive score by 1.63 points (0.40 S.D.). Other retirement pathways did not have a significant effect. When retirement was considered as a single binary variable, neither OLS nor IV results were significant.	Low

Nishimura, Y., Oikawa, M., & Motegi, H. (2018). What Explains the Difference in the Effect of Retirement on Health? Evidence from Global Aging Data. Journal of Economic Surveys, 32(3), 792–847. https://doi.org/10.1111/joes.12215	IV (2SLS) - pension eligibility ages	Aged 50+ / US, Europe, Japan, Korea / 1996-2014	Selection criteria varies throughout	Immediate, delayed, and total word recall	Results of causal studies on the effect of retirement on health (including cognitive function) are not sensitive to definition of retirement, but they are sensitive to the country studied and the analysis method. In the US, retirement caused a decrease of 0.781 points in men's total word recall, but there was no significant effect for women or the full sample. In Korea, retirement led to a 1.895-point (1.316-point) increase in total word recall for the full sample (men); a female-only sample was not used. In other countries,there was no significant effect of retirement on cognition.	Low
Rose, L. (2020). Retirement and health: Evidence from England. Journal of Health Economics, 73, 102352. https://doi.org/10.1016/j.jhealeco.2020.102352	Longitudinal fuzzy RDD & IV (2SLS) - pension eligibility age	Aged 50+ / England / 1990-2013 (2002-2013 for cognitive results)	No selection criteria described	Orientation in time, immediate and delayed word recall, memory score, verbal fluency	There were no significant effects of retirement on any cognitive outcomes for men or women.	Low

Baumann, I., Eyjólfsdóttir, H. S., Fritzell, J., Lennartsson, C., Darin-Mattsson, A., Kåreholt, I., Andel, R., Dratva, J., & Agahi, N. (2022). Do cognitively stimulating activities affect the association between retirement timing and cognitive functioning in old age? Ageing & Society, 42(2), 306–330. https://doi.org/10.1017/S0144686X20000847	Longitudinal, propensity score matching	Aged 70+ by 2014 / Sweden / 1974-2014	Exclusion: <9 years work experience, duplicates from overlapping birth cohorts, missing retirement age	Cognitive score (abridged Mini-Mental State Examination)	Retiring after age 65 was not associated with significantly different cognitive scores than retiring before or at age 65. When broken down into job characteristics and types, there were still no significant associations.	Medium
Bonsang, E., Adam, S., & Perelman, S. (2012). Does retirement affect cognitive functioning?. Journal of health economics, 31(3), 490–501. https://doi.org/10.1016/j.jhealeco.2012.03.005	Longitudinal IV (2SLS) - early and full pension eligibility ages	Aged 51-75 / US / 1998-2008	Exclusion: proxy interviews, never worked, retired before age 50, returned to work, missing work status or outcomes	Total word recall	Being retired for at least one year causes a significant 0.942-point decrease in total word recall Most of the drop in word recall occurs at the beginning of retirement. The difference in word recall between the early and the late retirees is likely to be relatively small at later stages of the retirement period.	Medium
Carmel, S., & Tur-Sinai, A. (2022). Cognitive decline among European retirees: Impact of early retirement, nation-related and personal characteristics. Ageing & Society, 42(10), 2343–2369. https://doi.org/10.1017/S0144686X21000064	Longitudinal	Aged 50+ / Europe / 2005-2011	Inclusion: follow-up four years after baseline	Memory decline (change in immediate and delayed word recall)	Early retirement at baseline was associated with 0.048 points greater memory decline compared to continuing to work. Each additional year of retirement was associated with 0.023 points greater memory decline per year. Returning to work after retirement was associated with less memory decline over time.	Medium

Carr, D. C., Willis, R., Kail, B. L., & Carstensen, L. L. (2020). Alternative Retirement Paths and Cognitive Performance: Exploring the Role of Preretirement Job Complexity. The Gerontologist, 60(3), 460–471. https://doi.org/10.1093/geront/gnz079	Longitudinal, propensity score matching	Aged 50+ / US / 1996-2010	Inclusion: working full time at baseline Exclusion: cognitive impairment in the first two waves	Change in total word recall	Remaining a continuous full-time worker was significantly associated with 0.613 points less decline in word recall relative to fully retiring. Retiring then returning to work was significantly associated with experiencing 70% less decline. Partially retiring was not associated with less decline. For individuals with high complexity jobs, retiring and returning to work was associated with a significant, slight cognitive benefit compared to fully retiring. For individuals with low complexity jobs, retiring and returning to work was not associated with a different rate of decline.	Medium
Clouston, S. A., & Denier, N. (2017). Mental retirement and health selection: Analyses from the U.S. Health and Retirement Study. Social science & medicine (1982), 178, 78–86. https://doi.org/10.1016/j.socscimed.2017.01.019	Longitudinal	Aged 50+ / US / 1998-2012	Inclusion: retired during study period Exclusion: missing work status or outcomes	Total word recall	Retirees had worse baseline cognitive functioning, but also experienced more rapid declines after retirement that was associated with an increase in the rate of aging by two-fold. Retirement was associatde with yearly losses of 3.7 percent of one s.d. in functioning. The rate of decline in those who retired was, on average for someone aged 65 years at baseline, about 2.2x as fast as among those who did not retire.	Medium

de Grip, A., Dupuy, A., Jolles, J., & van Boxtel, M. (2015). Retirement and cognitive development in the Netherlands: Are the retired really inactive?. Economics and human biology, 19, 157–169. https://doi.org/10.1016/j.ehb.2015.08.004	Longitudinal	Aged 24-81 at baseline / Netherlands / 1993-2007	Exclusion: chronic neurological pathology, chronic psychotropic drug use, or intellectual disability at baseline	Immediate and delayed memory, cognitive flexibility, information processing speed	In fixed-effects regressions, retiring is associated with a significant improvement in cognitive flexibility of 5.66 points, but a significant decline in information processing speed of 1.88 points. Less-educated individuals experience a significant 3.66-point greater decline in information processing speed after retirement compared to their highly-educated counterparts. Mood and health-related lifestyle do not explain the difference between retirees and workers. The magnitude of both changes in cognition resembles the difference in cognition between the age of 65 and 70 years old.	Medium
Denier, N., Clouston, S. A. P., Richards, M., & Hofer, S. M. (2017). Retirement and Cognition: A Life Course View. Advances in life course research, 31, 11–21. https://doi.org/10.1016/j.alcr.2016.10.004	Longitudinal	Aged ~53 / Wisconsin / 1992-2011	Inclusion: employed at baseline Exclusion: Left work without indicating retirement in a subsequent interview, missing study variables	Abstract reasoning, total word recall, and verbal fluency	Working in a blue-collar occupation was associated with lower word recall and verbal fluency scores. Being retired was associated with lower verbal fluency scores relative to individuals who remained working. Retirement duration was significantly, negatively associated with verbal fluency. Retirement was significantly associated with better abstract	Medium

					reasoning, especially in the short term. This association persisted when restricted to individuals who retired voluntarily, as well as for family-related reasons.	
Dufouil, C., Pereira, E., Chêne, G., Glymour, M. M., Alpérovitch, A., Saubusse, E., Risse-Fleury, M., Heuls, B., Salord, J. C., Brieu, M. A., & Forette, F. (2014). Older age at retirement is associated with decreased risk of dementia. European journal of epidemiology, 29(5), 353–361. https://doi.org/10.1007/s10654-014-9906-3	Longitudinal	Old-age pensioners / France / 2006-2011	Inclusion: craftworkers and shopkeepers, had healthcare information Exclusion: still working, dementia/cognitive impairment at baseline, Parkinson's, non-self-employed insurance beneficiaries	Age at dementia diagnosis	An increase of 1 year in the age at retirement was significantly associated with a 3.1 percent lower risk of dementia. The association was stronger in men than women.	Medium

Fisher, G. G., Stachowski, A., Infurna, F. J., Faul, J. D., Grosch, J., & Tetrick, L. E. (2014). Mental work demands, retirement, and longitudinal trajectories of cognitive functioning. Journal of occupational health psychology, 19(2), 231–242. https://doi.org/10.1037/a0035724	Longitudinal	Aged 51-61 at baseline / US / 1992-2010	Inclusion: worked in an occupation they held for at least 10 years at the time of retirement, data for 2+ waves, retired between the ages of 50 and 71 Exclusion: only selected one individual per household	Total word recall, mental status	Retiring was not associated with declines in memory in the surrounding retirement years. The rate of change in memory after retirement was significantly, slightly less steep compared to the years leading up to retirement. Individuals who were in occupations characterized by more mental activities were more likely to exhibit better memory and less steep declines in memory in the years after retirement.	Medium
Hale, J. M., Bijlsma, M. J., & Lorenti, A. (2021). Does postponing retirement affect cognitive function? A counterfactual experiment to disentangle life course risk factors. SSM - population health, 15, 100855. https://doi.org/10.1016/j.ssmph.2021.100855	g-formula	Aged 55-75 / US / 1996-2014	Inclusion: self-responses for outcomes, participated in the labor market at some point 1996–2014 Exclusion: retired at baseline, missing covariates	Cognitive score (immediate and delayed word recall, working memory, processing speed)	Delaying retirement to age 67 allows men to retain a cognitive function score 0.31 points higher than if their retirement had not been delayed, and for women, 0.36 points higher. Relative to average decline over the age 61-67 period, this represents approximately a one-third reduction in cognitive decline. Among those who retire before 67, postponed retirement had a substantial effect on men (0.42 points higher) and women (0.44 points). Men and women do not seem to benefit differentially. Workers in non-professional (0.45 points higher) and professional occupations (0.37	Medium

					points higher) appear to benefit from postponed retirement, with a greater but non-significant benefit to the former.	
Hamm, J. M., Heckhausen, J., Shane, J., & Lachman, M. E. (2020). Risk of cognitive declines with retirement: Who declines and why?. Psychology and aging, 35(3), 449–457. https://doi.org/10.1037/pag0000453	Longitudinal, propensity score matching	Aged 50+ / US / 2004-2013	Inclusion: retired during the study Exclusion: missing study variables	Total word recall, executive functioning	Retiring was associated with steeper declines in episodic memory only for those who were high in goal disengagement (β = −0.20) compared to continuing to work. When disaggregated by gender, results were only significant for women. There were no significant associations with executive functioning.	Medium
Hwang, I. C., Ahn, H. Y., & Suh, H. S. (2022). Retirement is not associated with age-related cognitive impairment in Korean adults. American Journal of Industrial Medicine, 65(9), 762–767. https://doi.org/10.1002/ajim.23408	Longitudinal	Aged 45+ / South Korea / 2006-2018	Exclusion: cognitive impairment or psychiatric disorder at the second survey, missing retirement data	Cognitive score $\leq$ 24 (orientation, registration, attention and calculation, memory recall, language, and	Unadjusted models indicated a significant association between retirement and cognitive impairment compared to continuing to work. However, this became insignificant after controlling for age.	Medium

				visual construction)		
Jung, D., Lee, J., & Meijer, E. (2022). Revisiting the Effect of Retirement on Cognition: Heterogeneity and Endowment. Journal of the economics of ageing, 21, 100361. https://doi.org/10.1016/j.jeoa.2021.100361	Longitudinal IV (2SLS) - early and full pension eligibility age	Men aged 60-69 / US / 1996-2014	Inclusion: pre- and post-retirement data Exclusion: proxy interviews.	Total word recall	Continuing to work is associated with approximately 0.07 S.D. greater word recall. However, IV models estimate an effect more than ten times larger than OLS models do. Physical demand of a career is not significant, but cognitive demand of a job is tied to higher cognition.	Medium
Kim, J. H., Muniz-Terrera, G., & Leist, A. K. (2023). Does (re-)entering the labour market at advanced ages protect against cognitive decline? A matching difference-in-differences approach. J Epidemiol Community Health, 77(10), 663–669. https://doi.org/10.1136/jech-2022-220197	DID, propensity score matching	Aged 61+ at baseline / South Korea, US / 2006-2020	Inclusion: worked during study period, 5+ consecutive waves of data Exclusion: missing outcomes	Cognitive score (orientation, registration, attention and calculation, memory recall, language, and visual construction)	For Koreans, entering the labor market led to an immediate 0.653-point increase in cognitive score; for Americans, no effect was noted. For Koreans (Americans), retiring led to an immediate 0.483-point (0.432-point) decrease in cognitive score. In subgroup analyses with the HRS data, retiring led to greater decreases in cognitive score for individuals with below-median baseline asset level, low education, and men.	Medium

Lee, Y. J., Gonzales, E., Wu, Y., Braun, K. L., Martin, P., Willcox, B., & Andel, R. (2024). The association between activities and cognitive health: Stratified analysis by APOE ε4 status. Journal of Alzheimer's disease reports, 8(1), 1502–1515. https://doi.org/10.1177/25424823241290528	Longitudinal	Aged 51+ / US / 2010-2016	Exclusion: proxy interviews, poor cognition at baseline, missing outcomes	Cognitive score (immediate and delayed word recall, working memory, processing speed)	Being employed part-time/partially retired was associated with a 0.32-point higher cognitive score compared to working full-time; being fully retired was not associated with a significantly different cognitive score. In individuals without an APOE ε4 allele, part-time work/partial retirement was associated with a 0.38-point higher cognitive score compared to full-time work; full retirement was still not significantly different from full-time work. Among individuals with at least one APOE ε4 allele, there were no significant associations between employment and cognition.	Medium
Lee, Y., Chi, I., & Palinkas, L. A. (2019). Retirement, Leisure Activity Engagement, and Cognition Among Older Adults in the United States. Journal of aging and health, 31(7), 1212–1234. https://doi.org/10.1177/0898264318767030	Path analysis	Aged 50+ / US / 2004-2008	Exclusion: cognitive impairment at baseline, never worked, returned to work, missing study variables	Cognitive score (immediate and delayed word recall, working memory, processing speed)	Remaining retired was associated with a 0.321-point lower cognitive score relative to continuing to work. However, transitioning to retirement was not associated with different cognitive scores. High level of engagement in mental leisure activities was associated with a 0.191-point higher cognitive score compared to low level of engagement. A high level of	Medium

					engagement in physical, social, and household activities was not significantly associated with cognition.	
Lei, X., & Liu, H. (2018). Gender difference in the impact of retirement on cognitive abilities: Evidence from urban China. Journal of Comparative Economics, 46(4), 1425–1446. https://doi.org/10.1016/j.jce.2018.01.005	Pooled cross-sectional IV (2SLS) - mandatory retirement and its differential enforcement between public and private sectors	Urban adults aged 45-70 / China / 2011-2015	Exclusion: self-employed, informally employed, never worked, women who retired before age 40, men who retired before age 45, missing study variables	Total word recall and mental status (serial 7 subtraction, orientation in time, drawing)	For men, IV models estimate that retiring increased word recall by 0.829-0.871 points, but had no significant effect on mental status. OLS models estimate that retiring is associated with no significant change in word recall and a 0.290-point decrease in mental status. Blue-collar workers especially pursue an active lifestyle that improves their cognition upon retirement. For women, retiring decreased word recall by 0.559-0.936 points, but the result was only weakly significant. Retiring also significantly decreased mental status by 0.982-1.021 points. OLS models estimate that retiring was associated with a 0.415- and 0.374-point reduction in word recall and mental status, respectively. Females appear to be much less active upon retirement.	Medium

					The effect of retirement appears to be delayed, not instantaneous.	
Liu, A. C., Patel, M. D., Gross, A. L., Mosley, T. H., Schneider, A. L. C., Kucharska-Newton, A. M., Sharrett, A. R., Gottesman, R. F., & Koton, S. (2024). Occupation, Retirement Age, and 20-Year Cognitive Decline: The Atherosclerosis Risk in Communities Neurocognitive Study. Neuroepidemiology, 58(4), 292–299. https://doi.org/10.1159/000534791	Longitudinal	Aged 45-64 / North Carolina, Minnesota, Mississippi, Maryland / 1990-2013	Inclusion: Black or White, working at baseline Exclusion: Black participants in Maryland and Minnesota, missing work status	Cognitive score (delayed word recall, verbal fluency, and digit symbol substitution)	Retirement by 70 years of age was significantly associated with lower baseline cognitive scores and with less 21-year cognitive decline in White women, White men, and Black men. E.g., compared to White women not retired by age 70, White women who retired by age 70 had on average 0.257 SD less 21-year cognitive decline. Retirement by age 70 was insignificantly associated with less cognitive decline in Black women.	Medium

Mäcken, J., Riley, A. R., & Glymour, M. M. (2021). Cross-national Differences in the Association Between Retirement and Memory Decline. The journals of gerontology. Series B, Psychological sciences and social sciences, 76(3), 620–631. https://doi.org/10.1093/geronb/gbaa223	Longitudinal	Aged 50-65 at baseline / Europe / 2004-2017	Inclusion: in paid work at baseline, in country with sufficient # of retirement transitions Exclusion: worked past age 70, missing retirement or outcomes data	Total word recall	Retirement was associated with a 0.044-point decrease in the age-slope for memory compared to continuing to work. There was a pronounced short-term decline after retirement and a more subtle change in rate of decline over the long term. There was substantial cross-country variation in the association between retirement and memory decline. Delaying retirement for a year was associated with 0.045-point better word recall.	Medium
Mazzonna, F., & Peracchi, F. (2012). Ageing, cognitive abilities and retirement. European Economic Review, 56(4), 691–710. https://doi.org/10.1016/j.euroecorev.2012.03.004	Cross-sectional IV (2SLS) - early and full pension eligibility ages	Aged 50-70 at baseline / Europe / 2004-2006	Inclusion: data on past employment status; in the labor force at age 50; classified themselves as employed, unemployed or retired, in country that participated in 2004 wave	Numeracy, immediate and delayed word recall, verbal fluency, and orientation in time	The rate of cognitive ability decline increased after retirement. Retirement causes a significant decrease in numeracy, orientation, and immediate recall scores for men; and numeracy, fluency, immediate recall, and delayed recall for women. However, the female sample may be biased. IV estimates are larger than OLS estimates, though this effect is only sizeable for women.	Medium

Mosca, I., & Wright, R. E. (2018). Effect of Retirement on Cognition: Evidence From the Irish Marriage Bar. Demography, 55(4), 1317–1341. https://doi.org/10.1007/s13524-018-0682-7	Cross-sectional IV (2SLS) - marriage bar and its differential enforcement between public and private sectors	Women aged 50+ / Ireland / 2014-2015	Exclusion: never worked	Colour Trail Tasks 1 & 2 (CTT1/2), Choice Reaction Time (CRT), and Choice Reaction Time Variability (CRTV) tests.	An additional year of retirement causes an insignificant 0.2 percent reduction in CTT1, a 0.1 percent reduction in CTT2, a 0.1 percent reduction in CRT, and a 0.3 percent reduction in CRTV. After control variables are added, the size of the this coefficient is approximately 20-25 percent the initial estimate.	Medium
Oi K. (2019). Does Gender Differentiate the Effects of Retirement on Cognitive Health?. Research on aging, 41(6), 575–601. https://doi.org/10.1177/0164027519828062	Longitudinal IV (2SLS) - early and full pension eligibility ages	Aged 50+ / US / 1992-2014	Inclusion: 2+ periods of outcomes data Exclusion: missing demographics	Cognitive score (immediate and delayed word recall, working memory, processing speed, object naming test, date recall, attention and processing speed, language, temporal orientation)	Fixed-effects OLS models suggest that retirement is associated with a 0.1470-0.1536-point decrease in cognitive score for women, but there was no significant association for men. IV models estimate that retirement leads to a 1.530-2.201-point decrease in cognitive score for women, but no significant effect for men. After adjusting for mobility issues and CESD score, IV models estimate that retirement leads to a 2.168-point decrease in cognitive score for women. When analyzed by subdomain of cognitive score, similar results were found for mental state and vocabulary. However, effects on delayed memory were negative in both men and women.	Medium

Oi, K. (2021). Does Retirement Get Under the Skin and Into the Head? Testing the Pathway from Retirement to Cardio-Metabolic Risk, then to Episodic Memory. Research on Aging, 43(1), 25–36. https://doi.org/10.1177/0164027520941161	Longitudinal IV (2SLS) - early and full pension eligibility ages	Aged 50+ / US / 2006-2014	Inclusion: data on episodic memory and cardio-metabolic risk (CMR) biomarkers	Total word recall	Fixed-effects OLS models estimate that being retired for 1+ year (<1 year) is associated with a 0.782-point (0.673-point) decrease in total recall. Fixed-effects IV models do not find that retirement significantly affects recall. When investigating the path from retirement to CMR to total recall, IV models estimate that being retired for 1+ year leads to a 1.999-point decrease in CMR, which leads to a 0.851-point increase in total recall (thus, a 1-point decrease in CMR increases recall by 0.426 points). When broken out by gender, retirement causes a 2.923-point decrease in CMR but does not affect recall. For women, retirement causes a 1.403-point decrease in CMR, which then leads to a 0.593-point increase in total recall.	Medium
Okamoto, S., Okamura, T., & Komamura, K. (2018). Employment and health after retirement in Japanese men. Bulletin of the World Health Organization, 96(12), 826–833. https://doi.org/10.2471/BLT.18.215764	Longitudinal, propensity score matching	Men aged 60-75 at baseline / Japan / 1987-2002	Exclusion: cognitive dysfunction, stroke, or diabetes at baseline; outlier weight	Memory questionnaire	Being in paid work was associated with a 2.22-year delay in experiencing cognitive decline compared to not being employed. When the paid work group was separated into self-employed individuals and employees, there were no significant associations between employment and time	Medium

					until experiencing cognitive decline.	
Peng, X., Yin, J., Wang, Y., Chen, X., Qing, L., Wang, Y., Yang, T., & Deng, D. (2022). Retirement and elderly health in China: Based on propensity score matching. Frontiers in Public Health, 10. https://doi.org/10.3389/fpubh.2022.790377	Cross-sectional, propensity score matching	Aged 45+ / China / 2018	Exclusion: missing study variables after supplementing with 2015 CHARLS wave	Cognitive score (date cognition, calculation and drawing ability)	Being retired was associated with a 0.57-point higher cognitive score compared to being employed. For low-educated men (women), being retired was associated with a 0.89-point (0.99-point) higher cognitive score; other combinations of gender and education level did not display a significant association between retirement status and cognitive function.	Medium
Rodriguez, F. S., & Saenz, J. (2022). Working in old age in Mexico: Implications for cognitive functioning. Ageing & Society, 42(11), 2489–2509. https://doi.org/10.1017/S0144686X2100012X	Longitudinal, propensity score matching	Aged 50+ / Mexico / 2001-2015	Exclusion: missing education, occupation, or outcomes; could not be processed with propensity score matching	Delayed word recall, verbal learning, and visual scanning	Accounting for age and occupation, continuing to work was associated with 0.55-point (0.61-point) lower verbal learning (delayed recall) scores compared to retiring, but 0.01-point slower declines for both verbal learning and delayed recall. Compared to production workers, domestic workers had a 0.02-point faster decline in verbal learning and verbal fluency if they continued working instead of retiring; those working in administration, sales, and	Medium

					education experienced a slower decline in visual scanning by 0.03, 0.02, and 0.03 points per year, respectively, if they continued working instead of retiring.	
Rohwedder, S., & Willis, R. J. (2010). Mental Retirement. The journal of economic perspectives : a journal of the American Economic Association, 24(1), 119–138. https://doi.org/10.1257/jep.24.1.119	Cross-sectional IV (2SLS) - early and full pension eligibility ages	Aged 55-65 / US, Europe / 2004	No selection criteria described	Total word recall	Among 60-64 year-olds, retirement is estimated to cause a significant, 4.7-point reduction in word recall (z≈1.5) compared to continuing to work. After adjusting for age, the estimated effect of retirement to a 5.7-point reduction in word recall. When the sample is expanded to include 55-65 year-olds, retirement is estimated to cause a 4.4-4.5-point drop in word recall.	Medium

Romero Starke, K., Seidler, A., Hegewald, J., Klimova, A., & Palmer, K. (2019). Retirement and decline in episodic memory: Analysis from a prospective study of adults in England. International Journal of Epidemiology, 48(6), 1925–1936. https://doi.org/10.1093/ije/dyz135	Longitudinal	Aged 50-75 at baseline / England / 2002-2010	Inclusion: retired during study period Exclusion: dementia or Alzheimer's in the study period; unemployed, permanently sick, or at home taking care of family at baseline.	Rates of change in immediate, delayed, and total word recall	There was little to no evidence of pre- and post-retirement differences in the rate of decline in immediate, delayed, or total word recall. Lower occupational classes were associated with greater pre- and post-retirement decline compared to higher occupational class.	Medium
Sundström, A., Rönnlund, M., & Josefsson, M. (2020). A nationwide Swedish study of age at retirement and dementia risk. International journal of geriatric psychiatry, 35(10), 1243–1249. https://doi.org/10.1002/gps.5363	Longitudinal	Born in 1930 / Sweden / 1990-2014	Exclusion: zero income, dementia diagnosis prior to 1990, missing education	Dementia diagnosis	An increase in retirement age by 1 year was associated with a 1.02-fold lower risk of dementia. Retiring at age 66+ was associated with a 2.9-fold lower risk of dementia compared to retiring at age 65. However, the association was attenuated over time. There was no significant association with dementia for those who retired between ages 61-64.	Medium

Vercambre, M. N., Okereke, O. I., Kawachi, I., Grodstein, F., & Kang, J. H. (2016). Self-Reported Change in Quality of Life with Retirement and Later Cognitive Decline: Prospective Data from the Nurses' Health Study. Journal of Alzheimer's disease, 52(3), 887–898. https://doi.org/10.3233/JAD-150867	Longitudinal	Females who retired between ages 60-69 / 11 US states / 1982-2004	Inclusion: nurses Exclusion: baseline outcome evaluation before the 1996 questionnaire or more than 5 years after the 1996 questionnaire, did not retire, missing work history or retirement quality of life	Rate of cognitive decline (based on mean z-score of immediate and delayed memory, cognitive status, attention, executive functioning)	In the study sample, there was no association between age at retirement and rate of cognitive decline. In the larger sample of all women who retired before 1996, retiring between ages 65-69 was associated with slower cognitive decline than retiring before age 65. Compared with women who reported no change in quality of life (QOL) at retirement, women who reported improvement showed a significantly slower rate of decline in cognitive score (+0.011 standard unit/year). No significant differences in cognitive decline rates were observed for the women who reported worsened QOL when compared to those who reported no change.	Medium

Wang, T., Liu, H., Zhou, X., & Wang, C. (2024). The effect of retirement on physical and mental health in China: A nonparametric fuzzy regression discontinuity study. BMC Public Health, 24(1), 1184. https://doi.org/10.1186/s12889-024-18649-w	Pooled cross-sectional fuzzy RDD - mandatory retirement and pension eligibility age	Males aged 50-70 and females aged 45-65 / China / 2011-2018	Inclusion: pensioners Exclusion: never worked, retired due to health reasons; missing outcomes or covariates	Total word recall, cognitive score (orientation, serial 7 subtraction, drawing)	For the full sample, retirement has no significant effect on total word recall or cognitive score. Female retirees experience insignificant 2.33- and 8.83-point drops in cognitive score and total recall, respectively; male retirees experience insignificant 1.91- and 1.98-point drops in cognitive score and total recall score, respectively. High-educated retirees experience an insignificant 1.39-point increase in cognitive score, while low-educated retirees experience an insignificant 3.28-point decrease in cognitive score. Low-educated (high-educated) retireees experience an insignificant 2.121-point (2.576-point) increase in total recall.	Medium
Wickrama, K. (K. A. S.), & O'Neal, C. W. (2013). The influence of working later in life on memory functioning. Advances in Life Course Research, 18(4), 288–295. https://doi.org/10.1016/j.alcr.2013.09.001	Longitudinal	Aged 65+ in 2002 / US / 1998-2006	Exclusion: missing work status	Immediate and delayed word recall and their rate of change	Work status was not associated with the initial level of immediate word recall. Full retirement, partial retirement, and not working were associated with 0.17-, 0.16-, and 0.15-points per year greater decline in immediate recall, respectively, compared to continuing full-time work. There were no significant associations between work	Medium

					status and either initial or rate of change in delayed word recall.	
Wickrama, K. (K. A. S.), O'Neal, C. W., Kwag, K. H., & Lee, T. K. (2013). Is Working Later in Life Good or Bad for Health? An Investigation of Multiple Health Outcomes. The Journals of Gerontology: Series B, 68(5), 807–815. https://doi.org/10.1093/geronb/gbt069	Longitudinal	Aged 62+ at baseline / US / 1998-2008	Exclusion: unemployed, missing work status	Immediate word recall	Over three time intervals (1998–2000, 2002–2004, and 2004–2006), greater work involvement at one point in time was associated with subsequent, significant increases in immediate word recall of 0.04, 0.06, and 0.07 points, respectively, compared to being retired.	Medium

Xu, H., Zhang, Z., Yang, X., Yang, Q., & Chen, T. (2025). Effects of extended working lives on depressive symptoms, physical, and cognitive health in middle and later life: Evidence from China. Social Science & Medicine, 369, 117833. https://doi.org/10.1016/j.socscimed.2025.117833	g-formula	Aged 45-80 / China / 2011-2020	Exclusion: proxy interviews, missing study variables	Cognitive impairment (score $\geq$ 19; immediate and delayed word recall, temporal orientation, numerical ability, and visuospatial skills)	Continuing to work was associated with a 15.8 percent higher odds of experiencing cognitive impairment in the subsequent wave compared to not working. For men and women, extending working life by one year increased population risk of cognitive impairment. For men, the largest effect was at age 65, where extension caused a 11 percent increase in impairment risk. For women, the greatest effect was at age 59, where extension caused a 16 percent increase in impairment risk. Extended working lives increased the risk of cognitive impairment in individuals with a primary school education or below (men: PRR = 1.15 at age 65, women: PRR = 1.17 at age 59), had a smaller effect on those with a junior high school education (women: PRR = 1.10 at age 59), and had no significant association for on those with a high school education or above.	Medium

Xue, B., Cadar, D., Fleischmann, M., Stansfeld, S., Carr, E., Kivimäki, M., McMunn, A., & Head, J. (2018). Effect of retirement on cognitive function: the Whitehall II cohort study. European journal of epidemiology, 33(10), 989–1001. https://doi.org/10.1007/s10654-017-0347-7	Longitudinal	Aged 35-55 in 1985–1988 / England / 1997-2013	Inclusion: civil servants in the London offices of 20 Whitehall deparments, pre- and post-retirement outcomes Exclusion: retired 1997-1999, returned to work	Short-term verbal memory, abstract reasoning (AH4), and semantic and phonemic verbal fluency	Retirement was associated with a 38 percent increase in the rate of decline in verbal memory compared to pre-retirement years. Associations were not significant for other kinds of memory. Higher employment grade was associated with a lower rate of decline in verbal memory while working, but there was no difference in post-retirement rates of decline in verbal memory. Sex was not significantly associated with pre- or post-retirement rates of decline.	Medium
Xue, B., Pai, M., & Luo, M. (2022). Working beyond SPA and the trajectories of cognitive and mental health of UK pensioners: Do gender, choice, and occupational status matter? European Journal of Ageing, 19(3), 423–436. https://doi.org/10.1007/s10433-021-00644-4	Longitudinal	Males aged 65-74, females aged 60-69 at baseline / England / 2008-2019	Exclusion: never worked; dementia at baseline; missing outcomes, reason to retire/work, or certain covariates	Total word recall, verbal fluency	For women, retiring for ill health was associated with 0.10-point greater declines in word recall per year compared to those who retired at state pension age (SPA) with no other reason for retirement. However, no other work statuses and reasons were associated with word recall. The association between ill-health retirement and memory decline was concentrated among older women of the highest occupational status. For men, there were no significant associations between work status and word recall. Work status was not associated with verbal fluency for men or women.	Medium

Adam, S., Bonsang, E., Grotz, C., & Perelman, S. (2013). Occupational activity and cognitive reserve: implications in terms of prevention of cognitive aging and Alzheimer's disease. Clinical interventions in aging, 8, 377–390. https://doi.org/10.2147/CIA.S39921	Cross-sectional	Aged 50+ / Europe / 2004	Exclusion: Israel, proxy interviews, outliers, missing study variables	Cognitive score (immediate and delayed word recall, verbal fluency)	All else equal, individuals who are still working have significantly higher cognitive function than retirees and those who never worked. A 60-year-old continuing to work is significantly associated with a delay in cognitive aging by 1.38 years.	High
Carpenter, C. W., Loveridge, S., & Mickus, M. (2021). Research note: Age, retirement, and intertemporal resource decision ability. Journal of Consumer Affairs, 55(2), 542–555. https://doi.org/10.1111/joca.12353	Cross-sectional	Aged 18+ / Michigan / 2006-2014	No selection criteria described	Illogical vs logical response to intertemporal questions	Retiring was associated with an increased likelihood of logical responses to the intertemporal questions of 0.469 to 1.394 percentage points compared to continuing to work. The interaction between age and retirement was associated with a decrease in the probability of a logical response of 0.006 to 0.019 percentage points.	High

Gosselin, C., & and Boller, B. (2024). The impact of retirement on executive functions and processing speed: Findings from the Canadian Longitudinal Study on Aging. Aging, Neuropsychology, and Cognition, 31(1), 1–15. https://doi.org/10.1080/13825585.2022.2110562	Longitudinal, propensity score matching	Aged 45-85 at baseline / Canada / 2012-2018	Inclusion: working at baseline Exclusion: cognitive problems at baseline, never worked, worked after retirement/ partially retired, unemployed, cognitive scores of 0, outliers on Choice Reaction Time, Mental Alternation Test score below 8, missing work status or demographics	Mental Alternation Test, Stroop Test (color naming, word reading, interference), Choice Reaction Time	Retirement was associated with a significantly higher Choice Reaction Time score for the English-speaking sample (F-stat=5.63, $p\eta^2$ = 0.01), but not the French-speaking sample. Retirement was not associated with Mental Alternation Test scores; the interaction between retirement and time was associated with significantly greater decline among English-speaking retirees compared to workers (F-stat=4.27, $p\eta^2$ = 0.01), but not French-speakers. Retirement was not associated with Stroop scores; the interaction between retirement and time was associated with significantly greater decline for color-naming and interference among English speakers, but not French speakers.	High

Grotz, C., Letenneur, L., Bonsang, E., Amieva, H., Meillon, C., Quertemont, E., Salmon, E., Adam, S., & ICTUS/DSA group (2015). Retirement age and the age of onset of Alzheimer's disease: results from the ICTUS study. PloS one, 10(2), e0115056. https://doi.org/10.1371/journal.pone.0115056	Longitudinal	Patients w/ probable AD / Europe / 2003-2005	Exclusion: never worked, did not retire, retired before age 50, retired after Alzheimer's onset	Age at onset of cognitive impairment and age of diagnosis w/ probable AD	Each additional year of employment was associated with a delay in the age at onset of symptoms by 0.30 years and the age at diagnosis by 0.31 years. For those who retired before 65, each additional year of employment was associated with delayed age at onset of symptoms and diagnosis by 0.15 years. For those who retired before 65 and were diagnosed with Alzheimer's disease after 75, the association was much weaker and no longer significant.	High
Grotz, C., Meillon, C., Amieva, H., Stern, Y., Dartigues, J. F., Adam, S., & Letenneur, L. (2016). Why Is Later Age at Retirement Beneficial for Cognition? Results from a French Population-based Study. The journal of nutrition, health & aging, 20(5), 514–519. https://doi.org/10.1007/s12603-015-0599-4	Longitudinal	Aged 65+ / France / 1999-2012	Inclusion: from center of Bordeaux Exclusion: housewife, dementia at baseline, dementia diagnosis within 10 years of retirement, missing work history	Dementia diagnosis	Retiring between the ages 60-65 years and over 65 years was associated with 28% and 43% lower risk of dementia, respectively, compared to individuals who retired at 60 years old. For an equal age at retirement, the number of working years was not associated with the risk of dementia.	High

Ihle, A., Grotz, C., Adam, S., Oris, M., Fagot, D., Gabriel, R., & Kliegel, M. (2016). The association of timing of retirement with cognitive performance in old age: the role of leisure activities after retirement. International psychogeriatrics, 28(10), 1659–1669. https://doi.org/10.1017/S1041610216000958	Cross-sectional	Retirees aged 65+ / Switzerland / 2011-2012	Inclusion: fully retired, completed the Mill Hill vocabulary test.	Trailmaking Test (TMT) A & B; Mill Hill vocabulary test	Performance on TMT A & B was significantly better in early retirees compared to those with retirement at legal age (TMT A: $\beta = -0.12$; TMT B: $\beta = -0.11$) and to late retirees (TMT A: $\beta = -0.11$; TMT B: $\beta = -0.08$). For Mill Hill, performance was significantly better in early retirees compared to those with retirement at legal age ($\beta = 0.08$) and in late retirees compared to those with retirement at legal age ($\beta = 0.06$). A higher cognitive level of job, low physical demand of job, higher educational attainment, and a higher number of leisure activities were significantly associated with better performance in the three cognitive domains.	High
Li, J., Yuan, B., & Lan, J. (2021). The influence of late retirement on health outcomes among older adults in the policy context of delayed retirement initiative: An empirical attempt of clarifying identification bias. Archives of Public Health, 79(1), 59. https://doi.org/10.1186/s13690-021-00582-8	Longitudinal	Males aged 60+; females aged 55+ / China / 2015-2018	Exclusion: missing study variables	Self-reported problems of cognitive status	Non-late retirees have a significantly higher mean value of problems of cognitive status than late retirees (Mean non-late retirees = 3.632, and Mean late retirees = 3.559). Becoming a late retiree in 2015 is associated with a 0.089-point reduction problems of cognitive status in 2018.	High

Lupton, M. K., Stahl, D., Archer, N., Foy, C., Poppe, M., Lovestone, S., Hollingworth, P., Williams, J., Owen, M. J., Dowzell, K., Abraham, R., Sims, R., Brayne, C., Rubinsztein, D., Gill, M., Lawlor, B., Lynch, A., & Powell, J. F. (2010). Education, occupation and retirement age effects on the age of onset of Alzheimer's disease. International journal of geriatric psychiatry, 25(1), 30–36. https://doi.org/10.1002/gps.2294	Cross-sectional	Males w/ late-onset AD. / England, Ireland, & Wales / No time period described.	Inclusion: Caucasian	Age-of-onset of AD	Each additional year of employment (or each delay of a year in retirement) was associated with a significant 0.13-year later age-of-onset for Alzheimer's disease.	High
Oi, K. (2020). Disuse as time away from a cognitively demanding job; how does it temporally or developmentally impact late-life cognition? Intelligence, 82, 101484. https://doi.org/10.1016/j.intell.2020.101484	Longitudinal	Aged 50+ / US / 1996-2016	Exclusion: never worked	Total word recall, vocabulary test	For total word recall scores, the extent of decline that occurs over a period away from work peaks in the first 5–6 years but wanes after. Each year of disuse is associated with a 0.012-point increase in vocabulary score compared to continuing to work Leaving work is associated with faster decline in word recall and vocabulary scores relative to those who continue working; the gap between retirees and workers is greater for jobs with low cognitive demand than for jobs with high demand.	High

Rennemark, M., & Berglund, J. (2014). Decreased cognitive functions at the age of 66, as measured by the MMSE, associated with having left working life before the age of 60: Results from the SNAC study. Scandinavian Journal of Public Health, 42(3), 304–309. https://doi.org/10.1177/1403494813520357	Longitudinal	Aged 60 at baseline / Sweden / 2001-2009	No selection criteria described	Cognitive score (orientation, registration, attention and calculation, recall, and language), cognitive score decline	Work status at age 60 was not associated with differences in cognitive status at age 60. However, upon follow-up six years later, having been working at age 60 was associated with higher cognitive function than having retired before age 60 for either disability or another reason. Having retired before age 60 for any reason was associated with a 141 percent increase in the odds of experiencing cognitive decline, compared to still having been working at age 60.	High
Roberts, B. A., Fuhrer, R., Marmot, M., & Richards, M. (2011). Does retirement influence cognitive performance? The Whitehall II Study. Journal of epidemiology and community health, 65(11), 958–963. https://doi.org/10.1136/jech.2010.111849	Longitudinal	Civil servants aged 35–55 working in the London offices of 20 Whitehall departments in 1985–1988 / England / 1991-1999	Inclusion: pre- and post-retirement outcomes Exclusion: missing study variables	Short-term verbal memory, abstract reasoning (AH4), and semantic and phonemic verbal fluency	In fully adjusted models, retirement was associated with improvement in abstract reasoning that was 0.7 T-score points slower than those who remained in work. Other associations were not significant, but also negative. The association between percentage of time spent in retirement and cognitive function did not show a linear trend. Thus, there was no evidence of a dose-response effect for cognitive scores in relation to time spent in retirement.	High

Strickhouser, J. E., & Sutin, A. R. (2021). Personality, Retirement, and Cognitive Impairment: Moderating and Mediating Associations. Journal of Aging and Health, 33(3–4), 187–196. https://doi.org/10.1177/0898264320969080	Longitudinal	Aged 50+ / US / 2008-2018	Exclusion: cognitive impairment at baseline, missing retirement or personality data at baseline	Dementia, cognitive impairment without dementia (CIND; based on immediate and delayed word recall, working memory, and processing speed)	Controlling for FFM personality traits and conscientiousness, being retired was associated with a 18-22 percent increased risk of developing dementia compared to not being retired. Retirement did not moderate associations between FFM personality traits and dementia risk, but moderated associations between the industriousness and self-awareness facets of conscientiousness and dementia risk. Controlling for FFM personality traits and conscientiousness, retirement was associated with a 6-9 percent increased CIND risk. Retirement did not moderate associations of FFM personality traits, but did moderate relationships between the virtue and responsibility facets of conscientiousness and CIND risk.	High

Zotcheva, E., Strand, B. H., Bowen, C. E., Bratsberg, B., Jugessur, A., Engdahl, B. L., Selbæk, G., Kohler, H.-P., Harris, J. R., Weiss, J., Grøtting, M. W., Tom, S. E., Krokstad, S., Stern, Y., Håberg, A. K., & Skirbekk, V. (2023). Retirement age and disability status as pathways to later-life cognitive impairment: Evidence from the Norwegian HUNT Study linked with Norwegian population registers. International Journal of Geriatric Psychiatry, 38(7), e5967. https://doi.org/10.1002/gps.5967	Longitudinal	Aged 69-86 at time of cognitive assessment / Norway / 1984-2019	Inclusion: employed for at least one year 1967–2019, employed until age 55+, retired at time of cognitive assessment Exclusion: missing retirement age or outcomes	Mild cognitive impairment (MCI) and dementia diagnoses	In adjusted models, for men who retired via the disability pathway, each year of postponed retirement was associated with an 8 percent lower risk of dementia. Retiring one year later via the on-time or late pathway was associated with an 8 percent lower risk of MCI, but was not associated with dementia. Retiring one year later via the early pathway was unrelated to either dementia or MCI. For women, retiring one year later via any pathway was unrelated to dementia and MCI after adjusting for potential confounders. For men (women), disability retirement was associated with a 64 (70) percent increased risk of dementia compared to on-time retirement. For men, the late retirement group had a 24 percent lower risk of MCI than the on-time group. Late retirement was unrelated to dementia risk for men or women.	High

Table 2: Characteristics of Notable Datasets and Dataset Families

Dataset/Family	Description	Example Datasets
Health and Retirement Study (HRS) International Family of Studies	Harmonized, nationally representative panel surveys of older adults in over 20 countries. Includes data on aging, health and finances, and in some countries may be linked to healthcare claims.	HRS, China Health and Retirement Longitudinal Study (CHARLS), Malaysia Ageing and Retirement Study (MARS)
Harmonized Cognitive Assessment Protocol (HCAP) Network	Older adult cohort studies that use harmonized cognitive and neuropsychological assessment instruments. Overlaps substantially with the HRS International Family of Studies.	HRS, Chile Cognitive Aging Study (Chile-Cog), Longitudinal Study of Health and Ageing in Kenya (LOSHAK)
National Alzheimer's Coordinating Center (NACC)	Centralized data repository for the Alzheimer's Disease Research Centers (ADRCs). Includes longitudinal clinical evaluation, neuroimaging, biospecimen, and demographic data from cognitively normal, cognitively impaired, and ADRD participants in the U.S.	—

Global Alzheimer's Association Interactive Network (GAAIN)	Data platform that enables researchers to share, find, and connect international ADRD-related datasets. Datasets are not perfectly harmonized, but may be connected by using the GAAIN platform to search for specific variables. Includes datasets with demographic, clinical, genetic, imaging, and other types of data.	HRS, French National Alzheimer Database (FNAD), Argentina-Alzheimer's Disease Neuroimaging Initiatve (Arg-ADNI)
Connecting Cohorts to Diminish Alzheimer's Disease (CONCORD-AD) collaboration network	Research collaboration network of seven longitudinal dementia cohort studies from North America, Europe, and Australia. Studies are not harmonized, but each includes at least one of: biomarker, imaging, cognitive impairment or ADRD diagnosis, or cognitive assessment data in addition to demographics.	Australian Imaging, Biomarker, and Lifestyle Flagship Study of Ageing (AIBL), Mayo Clinic Study of Aging (MCSA), Three-City Study Bordeaux (3C Bordeaux)