



Research paper

Retirement and cognition: A life course view

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ABSTRACT

This study examines the relationship between retirement and cognitive aging. We build on previous research by exploring how different specifications of retirement that reflect diverse pathways out of the labor market, including reason for leaving the pre-retirement job and duration spent in retirement, impact three domains of cognitive functioning. We further assess how early-life factors, including adolescent cognition, and mid-life work experiences, condition these relationships. To do so, we draw on longitudinal data from the *Wisconsin Longitudinal Study*, a cohort study of Wisconsin high school graduates collected prospectively starting in 1957 until most recently in 2011 when individuals were aged 71. Results indicate that retirement, on average, is associated with improved abstract reasoning, but not with verbal memory or verbal fluency. Yet, when accounting for the reason individuals left their pre-retirement job, those who had retired for health reasons had both lower verbal memory and verbal fluency scores and those who had retired voluntarily or for family reasons had improved abstract memory scores. Together, the results suggest that retirement has an inconsistent effect on cognitive aging across cognitive domains and that the conditions surrounding the retirement decision are important to understanding cognitive functioning at older ages.

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1. Introduction

The life course is commonly delineated by economic activities: early life is spent in school, mid-life in work, and old age in retirement (Settersten, 2003). Such patterning almost inextricably links working, or leaving work, to the process of aging. At the same time, developmental research shows that most cognitive abilities develop along a similar path, expanding in early life, plateauing in mid-life, and beginning to decline as early as age 45 (Richards & Deary, 2014; Richards, Shipley, Fuhrer, & Wadsworth, 2004; Singh-Manoux et al., 2012). Given the coincidence of these patterns, scholars have turned to examining whether retirement – a key life course transition marking the onset of old age – hastens cognitive aging.

This growing body of research proposes that retirement constitutes a period of “disuse,” wherein workers leave the labor force, and as retirees, cease using their full cognitive capabilities. While this account is compelling, it conceptualizes retirement as a single and standard transition out of the labor force. Recent evidence on the life course of retirement itself suggests that the retirement transition is increasingly destandardized, producing wide unevenness in the timing of and reasons for exit from the labor force later in life (Raymo, Warren, Sweeney, Hauser, & Ho, 2011; Szinovacz & Davey, 2005; Warner, Hayward, & Hardy, 2010). Those who choose to retire may be fundamentally different from those who cannot afford to retire or those who cannot expect to retire. To date, little research has examined how associations between retirement and cognitive aging might vary across different specifications of retirement that reflect the diverse pathways and contexts under which people make their final exit from the labor force.

This study aims to fill that gap. To do so, we draw from data on a cohort of Wisconsin high school graduates in the Wisconsin Longitudinal Study (WLS) and examine the longitudinal

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association between retirement and cognitive aging. We conceptualize retirement status in terms of participation in paid work, main reason for leaving pre-retirement employment (e.g. family/health/job loss), and duration of retirement. In addition to elaborating which aspects of the retirement transition are associated with cognitive aging, our use of the WLS offers important improvements over analyses of other common data. The WLS contains rich life course data beginning in adolescence across a broad range of measures relating to cognition and labor force engagement. This allows us to explore how early- and mid-life events condition the relationship between retirement and cognition in later life in a way that is not susceptible to recall bias. As a fairly age-homogenous cohort study, it also does not confound cohort- or period-effects, known to influence both retirement behavior and cognitive abilities, with age-effects (Flynn, 1984). We proceed by reviewing the literature on cognition and retirement.

1.1. Retirement and cognitive aging

Two separate bodies of research speak to the connections between retirement and cognitive aging. The first, largely conducted by economists, has been overwhelmingly concerned with identifying the causal effect of the retirement transition in precipitating cognitive decline. The second, largely conducted by psychologists, concerns understanding the age trajectory of cognition and then examining how retirement is associated with that trajectory. The focus in the economics literature on causality has led to identification strategies (paramount among them the use of instrumental variables to proxy retirement status) that differ from those employed in the psychology literature (primarily longitudinal growth curve analysis). We discuss each in turn below.

Early treatments in the economics literature identified large effects of retirement on cognition. In a seminal paper, Rohwedder and Willis (2010) drew on cross-sectional data from the United States (U.S.) and Europe, exploiting cross-national variation in pension eligibility ages to provide instruments for retirement status. With this approach, the authors found that not working is associated with a 37% reduction in a combined measure of immediate and delayed word recall. Bingley and Martinello (2013) demonstrated that this effect is biased by a failure to control for education, as pension eligibility ages are correlated with cross-national variation in educational attainment. Cross-sectional studies accounting for education show smaller negative effects (Mazzonna & Peracchi, 2012). Mediation may also be due, in part, to variation in association between retirement and cognition by occupational class. Coe, von Gaudecker, Lindeboom, and Maurer (2012) showed using pooled cross-sections of the U.S. Health and Retirement Study (HRS) that duration spent in retirement has no impact on a number of measures of cognition for white-collar workers, and that retirement may actually benefit cognitive function for blue-collar workers. Evidence from longitudinal data adds further nuance to this picture. Using Social Security eligibility ages as instruments for retirement to analyze six waves of the HRS, Bonsang, Adam, and Perelman (2012) find that not working is associated with a 9% reduction in verbal memory, and that the effect occurs shortly after retirement (exhibiting duration effects only in a logarithmic rather than linear specification of years since retirement). Celidoni, Dal Bianco, and Weber (2013) use longitudinal data from the Survey of Health, Ageing, and Retirement in Europe (SHARE), and find that duration spent in retirement, not retirement status per se, was associated with an increased likelihood of large (>20%) declines in verbal memory. At the same time, Bianchini and Borella (2015) find that retirement has a positive effect on verbal memory when allowing for a non-linear effect of age on cognition, using the same SHARE data.

Together, economic research on the links between retirement and cognition is mixed, but generally shows that there are small and negative effects of retirement on verbal memory, in particular. Most of this research has relied on surveys of individuals at older ages, precluding analysis of longer trajectories. As such, it also does not consistently take into account how life course events, especially those that occur in early life, relate to cognition, or mediate the relationship between retirement and cognition, at older ages.

Mapping cognitive change over the life course has been a central aim of a large body of research in psychology (Hofer & Clouston, 2014; Hofer & Sliwinski, 2001; Sliwinski, 2010). Understanding cognition at older ages has thus led scholars to study retirement as one, among many, possible changes in daily activity patterns that shape trajectories of cognitive aging. As such, this research employs primarily longitudinal methods. Roberts, Fuhrer, Marmot, and Richards (2011) for instance, examined the Whitehall II cohort of U.K. civil servants and found that retirees showed lower growth in scores on cognitive tests than those who remained working. Wickrama and O'Neal (2013) use the 1998–2006 HRS to model how a change in work status from 1998 to 2002 impacted subsequent cognitive aging. Their growth curve analysis shows that individuals who transitioned to retirement displayed greater deterioration in verbal learning, but not verbal memory, than those who continued to work.

While studies in both fields suggest that retirement influences cognition, the characteristics of retirement that are meaningful to cognitive health remain unclear, at least in part because of variability or lack of specificity in the definition of retirement across studies. Research often specifies retirement as a “lack of work,” equating retirees with those not working for any other reason (Bonsang et al., 2012; Rohwedder & Willis, 2010). As discussed in the next section, non-employment is a poor proxy for retirement: labor force participants are often healthier than non-participants because unhealthy people have fewer opportunities to, and more barriers involved in, working. Even when researchers use a more fine-grained definition of retirement (e.g. Wickrama & O'Neal 2013), few studies have accounted for the reasons individuals retire, which may provide insight into their subsequent cognitive health. In the next section we discuss the meaning of retirement in contemporary labor markets and how it may impact understanding of aging-related processes.

1.2. The retirement life course

Retirement has historically been viewed as a single and irreversible exit from work, in part because statutory pension eligibility ages commonly influence the decision to retire, even defining one's retirement status (Gruber and Wise 1998). Recent economic and policy-related changes away from career employment have meant that retirees experience labor force exits that vary in timing, degree, and income shock. Contemporary research on the retirement life course conceptualizes it as a multi-faceted and dynamic process that comprises interrelated transitions, and may be characterized by considerable heterogeneity in age at first retirement, duration of retirement, and likelihood of re-entry to the labor force (Kail & Warner, 2013; Warner et al., 2010). For instance, Warner et al. (2010) find that over 70% of men's retirement transitions occur outside the framework of Social Security eligibility ages in the U.S., a result supported by Raymo et al. (2011). Individuals increasingly re-enter the labor force after retiring by engaging in “bridge” jobs, especially if they retired earlier than anticipated (Heinz, 2003).

Such differences may be informative to complexity in aging-related processes: not only is involuntary job loss at older ages associated with deterioration in mental health and increased

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