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Background. Non-employment periods during working life may hinder the development of cognitive reserve but may also provide time for engaging in cognitively stimulating non-work-related activities. This study examines whether different types of non-employment periods during working life predict cognitive function in old age.

Methods. Cognitive function of 18,419 participants from 13 countries in the *Survey of Health, Ageing, and Retirement in Europe* (age 50-73) was assessed in 2004 and 2006. Type and duration of non-employment spells were derived from complete work histories reported in 2008.

Results. Non-employment spells due to sickness, unemployment or homemaking predicted higher odds of cognitive impairment (for sickness: odds ratio (OR) = 1.73, 95 % confidence interval (CI): 1.53, 1.96), whereas spells due to training, retirement and maternity leave were associated with lower odds of cognitive impairment (for training: OR = 0.54, 95 % CI: 0.44, 0.66). Longer non-employment periods in sickness were associated with higher odds of impairment, while longer non-employment periods in training were associated with lower odds of cognitive impairment. Adjustment for early life factors such as childhood socioeconomic status, school performance, and education attenuated but did not eliminate associations between non-employment spells and cognitive function. Late-life factors such as occupation, income, wealth, and health mediated part of the associations between non-employment spells and cognitive function.

Conclusions. The association between non-employment and later cognitive impairment varies according to the type of activity during periods of non-employment. Cognitively demanding activities such as training during non-employment periods might prevent cognitive impairment.