Gerontological Research and Theories on Cognitive Abilities

Yong Lu

Faculty of Theology, Cardinal Stefan Wyszyński University in Warsaw

luyong@tju.edu.cn
www.lu-yong.com

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Overview

Cognitive Abilities in Old Age — Outline and Interindividual Differences

Cognitive Aging and the Recognition Heuristic

Cognitive Aging and Strategy Selection Learning

Evidence from the Field of Geriatric Neuropsychology
Empirical findings suggest that cognitive development across adulthood may be described as a process of linear decline that accelerates into old and very old age. However, age-related changes in cognitive ability are best characterized as being multidirectional, with some, but not all cognitive abilities following a pattern of decline [Zimprich et al., 2008]. For instance, in old age, measures of processing speed usually show the largest age decrements, and fluid abilities, such as reasoning, typically exhibit the second largest age decrements. By contrast, knowledge-based measures often mainly largely stable [Hofer and Sliwinski, 2001].

The related findings, taken together, suggest that performance changes depend considerably on the cognitive domain examined: Decrements are small, on average, in familiar tasks that rely on existent knowledge, whereas decrements are more pronounced in new tasks that require the acquisition of knowledge.
There are systematic interindividual differences in intraindividual changes in cognitive abilities, which implies that the process of cognitive aging is an individual-specific or differential one [Zimprich and Martin, 2002].

A number of explanatory variables of the modeling of individual differences on cognitive aging have been proposed in the last several decades, for example, a general cognitive slowing [Lu et al., 2013], a reduction in attentional capacity [McAvinue et al., 2012], a decline in the neural integrity of the cognitive system [Wirth et al., 2013], and a decrement in cognitive inhibition [Romberg et al., 2013].

Several researchers focus on unsystematic or random cognitive performance fluctuations within the individual differences therein, by examining whether individual differences in intraindividual variability or inconsistency in cognitive functioning are more pronounced in older adults [Nesselrode and Salthouse, 2004]. [Zimprich et al., 2008] found that cognitive aging is not a completely uniform process driven by a single causal variable.
The recognition heuristic, which predicts that a recognized object scores higher on some criterion than an unrecognized one, is a simple inference strategy and thus an attractive mental tool for making inferences with limited cognitive resources [Goldstein and Gigerenzer, 2002].

[Pachur et al., 2009] investigated the impact of cognitive aging on the applicability, accuracy, and adaptive use of the recognition heuristic. The results show that (a) young and old adults’ recognition knowledge is an equally useful cue for making inferences about the world; (b) as with young adults, old adults adjust their use of the recognition heuristic between environments with high and low recognition validities; and (c) old adults, however, show constraints in their ability to adaptively suspend the recognition heuristic on specific items.
[Mata et al., 2010] examined younger and older adults’ strategy selection learning in a probabilistic inference task and found that older adults showed poorer decision performance compared with younger adults, especially in an environment favoring the use of a more cognitively demanding strategy. However, in another research conducted by [Mata et al., 2007], both young and older adults seemed to be equally adapted decision maker in that they adjusted their information search and strategy selection as a function of environment structure.

[Mata, R. and Nunes, L.] conducted a meta-analysis of age differences in predecisional information search ($N = 1,304$) and found that less information search may be enough for the aging consumer to make a qualified decision because the neglected information may lead to only small losses in decision quality.
Evidence from the Field of Geriatric Neuropsychology

A growing number of scholars and theorists suggest that the cognitive processes supported by the frontal lobes, and more specifically the prefrontal cortex, are among the first to decline with increasing age. The age-related decline in item recall and recognition suggests that the frontal lobe hypothesis of aging provides a useful but incomplete neuropsychological model of cognitive aging [West, 1996]. For instance, the Self-Ordered Pointing Task [Guild et al., 2013] and Object Alternation Task [Lamar et al., 2013] have consistently been found to reveal age-related performance decline as early as the 6th decade of life.


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