

Longitudinal Relationships Between Cognitive and Functional Aging

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Even though conceptions of successful aging have taken dozens of forms, most conceptualizations acknowledge multiple components of successful aging that include, but are not limited to, maintenance of physical and cognitive functioning. Because of the possible implications for intervention and thus successful aging, researchers have striven to determine whether the age changes in physical and cognitive functioning are coincident, or does functioning in one domain change before, and possibly contribute to, functioning in the other.

Two methods for measuring physical functioning have been developed in SATSA. First, SATSA collected 20 performance measures functioning, which can be reduced to three factors assessing: balance, flexibility, and fine motor movement. In a second approach, SATSA researchers combined functional biomarkers of aging (sensory abilities, pulmonary function, grip strength, and gait speed) to create a measure of functional biological age. The aim was to create a measure of functional aging that could be used to predict outcomes in other domains.

Multiple methods have been used to examine aging of functional abilities in SATSA. Latent growth curve models identify trajectories of change with age and twin data allows us to estimate genetic and environmental influences on rates of change. The development of dual change score models (DCSM) to characterize age changes has facilitated specification and testing of dynamic hypotheses about patterns of aging. DCSM assist with identification of leading indicators of change by leveraging longitudinal data to examine the extent to which changes in one variable influence subsequent changes in a second variable, and vice versa.

Results from these approaches suggest a cascade of effects from physical functioning to cognitive functioning. For practitioners designing targeted interventions to prevent or slow cognitive decline, these data indicate that interventions focusing on improving or maintain physical function should have the added effect of maintaining cognitive function.