Changes in Old Age of Neurocognitive Functions and Everyday Functions Together

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Editorial

Although neurocognitive functions are known to decline normatively with adult age, there is a common belief that everyday functions are unaffected by these changes. This hypothesis was examined by applying longitudinal growth models to data from a community-based sample of 698 adults (ages 65 to 94 years and living independently at baseline) who were repeatedly measured over 5 years on neurocognitive tests of executive reasoning, episodic memory, and perceptual speed, and on a number of tasks that adults should be reasonably expected to be able to perform in their day-to-day lives. Individual differences in changes in neurocognitive performance strongly correlated with individual differences in changes in performance on the everyday tasks. Alternatively, changes in self-reports of everyday functions were only weakly correlated with changes in performance on the neurocognitive tests and the everyday tasks. There are at least three types of evidence potentially relevant to testing the independence versus interdependence of neurocognitive functions and everyday functions. First, one could examine the correlations between individual differences in cognition and everyday functions in older adults. In community-based cross-sectional samples of older adults a number of researchers have reported that such concurrent relations between performance on cognitive tests and objective tests of everyday functions range from approximately r = .30 to r = .70. However, while positive concurrent correlations could be indicative of a interdependence between cognition and everyday functions during late adulthood, they could also be reflective of a interdependence that existed earlier on in life, but no longer exists. Examination of concurrent relations between cognitive functions and everyday functions is therefore only likely to be of limited value for resolving the question of interdependence. Second, one could examine the extent to which everyday functions exhibit negative average age trends similar to those exhibited by neurocognitive functions. Using cross-sectional data, for example, reported that the correlation between age and everyday functions was −.23 in older adults ages 60 to 92 (compared to a correlation of −.26 between age and general cognitive ability in these same adults). Moreover, using seven-year longitudinal data, Willis reported that average levels of performance by healthy community-dwelling individuals on an objective measure of everyday functioning significantly declined from baseline to follow-up. However, while the finding that average levels of both cognition and everyday functions decline similarly with age could reflect a interdependency between changes in the two functions, it could also simply reflect the fact that many different functions, both psychological and physical, worsen with adult age. That is, similar average age trends in two variables do not necessarily indicate that the two variables change together for specific individuals. For example, that the proportions of gray hair and poor vision in a population increase with adult age does not necessarily mean that the individuals who go gray are also the same individuals who end up needing glasses. In fact, one could envision a circumstance in which the two subpopulations are entirely nonoverlapping, even while average age trends for the two prevalence rates in the aggregate population are identical. Examination of mean age trends is therefore only likely to be of limited value for resolving the question of interdependence.

Third, one could examine whether individual differences in rates of longitudinal changes in neurocognition correlate with individual differences in rates of longitudinal changes in everyday functions. Although there do not appear to be any previous examinations of this sort, such an examination would be a quite rigorous test of the interdependency hypothesis. Strong positive correlations between rates of changes in measures of the two constructs would indicate that individuals who change considerably in their neurocognitive functions tend to be the same individuals who change considerably in their everyday functions, whereas individuals who maintain their neurocognitive functions tend to be the same individuals who maintain their everyday functions. Because such longitudinal correlations involve individual differences in a process that is actually occurring in old age, this form of evidence is not subject to the criticism that the correlations may simply reflect a historical interdependence from earlier on in life. Correlations among longitudinal changes were therefore the focus of the current study. These three rationales presuppose an independence between cognition and everyday functions that must be explained. The current study seeks to examine this presupposition by investigating the extent to which neurocognitive declines and everyday functions are interdependent in old age.

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