Older Adults' Abstract Reasoning Ability Predicts Depressive Symptoms Over Time

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Age-related declines in abstract reasoning ability predict increasing depressive symptoms in subsequent years, according to data from a longitudinal study of older adults in Scotland. The research is published in *Psychological Science*, a journal of the Association for Psychological Science.

"Mental health in later life is a topic of increasing importance given aging populations worldwide," says researcher Stephen Aichele of the University of Geneva. "Our findings suggest that monitoring for cognitive decrements in later adulthood may expedite efforts to reduce associated increases in depression risk."

Many adults will experience some degree of cognitive decline in the latter decades of life. Research has also shown that cognitive impairments and depression are correlated in older adults – generally, as cognitive abilities decline, depressive symptoms increase. Yet, researchers have not been able to conclusively determine the direction of causation. That is, does cognitive decline lead to depression, does depression lead to cognitive decline, or do the phenomena mutually reinforce each other?

To achieve a clearer picture of the dynamics of this relationship over time, [Aichele and colleagues examined data collected as part of the Lothian Birth Cohort 1936](), a longitudinal study of adults in Scotland. Their analyses included data from 1,091 adults who were assessed at age 70 and up to three additional times in roughly 3-year intervals until age 79.

Although other work has examined depression risk in relation to memory deficits and other cognitive impairments associated with Alzheimer's disease and dementia, the researchers chose to look at participants' abstract reasoning, a cognitive ability that is closely related to functioning in daily life. Participants in the study completed several measures of abstract reasoning, performing tasks such as identifying missing elements from geometric patterns and reproducing visuospatial models using component parts.

The participants also provided information about their depressive symptoms via the Hospital Anxiety and Depression Scale.

On average, participants' abstract reasoning ability and depressive symptoms worsened over the course of the study. Additionally, relatively lower cognitive function at each assessment was associated with subsequent increases in depressive symptoms, and this association became stronger over time.

Aichele and colleagues used advanced statistical models to analyze the dynamic relationship between these two measures over time. They found that lower abstract reasoning scores at one assessment were associated with increased depressive symptoms at later assessments; increased depressive symptoms at a given assessment were not linked with subsequent changes in abstract reasoning.

Sociodemographic and other health-related factors — such as education level, socioeconomic status, and diagnoses related to cardiovascular disease, stroke, and diabetes – did not appear to influence the relationship between abstract reasoning and depressive symptoms.

Understanding why age-related decrements in abstract reasoning lead to increased depressive symptoms remains a question for future research. Aichele and colleagues note that there are several potential mechanisms that could be at work, including unmeasured disease processes, genetic susceptibility, and declines in daily functioning.

The researchers hope to continue this work by examining factors such as training, treatment, and social support that might weaken the link between cognitive decline and depression.

"We hope this research will be of broad interest, both for individuals directly affected by age-related cognitive decline and also for family members and care providers who wish to help older persons adversely affected by changes in mental health," Aichele says.

Coauthors on the research include Paolo Ghisletta of the University of Geneva and Janie Corley, Alison Pattie, Adele Taylor, John Starr, and Ian Deary of the University of Edinburgh.