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## Slowing Symptoms as Early Markers of Decline in Older Adults

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In this issue, Sanders and colleagues<sup>1</sup> present findings from the Longitudinal Aging Study Amsterdam (LASA) to show that processing speed and gait speed, indicators of slowing across different domains, can be combined to predict persistent cognitive decline (PCD), falls, and mortality. Slowing of thought and slowing of movement should be considered clinical markers for future adverse health events. Questions remain, though, about the potential synergistic and/or additive effect of the two indicators of slowing and whether they share a common pathway in hastening disability and death. The authors explored depression as a potential mechanism, but depression symptoms did not mediate or moderate the association between slowing and any of the adverse health outcomes.

The authors examined data from an ongoing longitudinal population-based study of adults aged 65+ years in the Netherlands.<sup>2</sup> A major strength of this study is the use of a large representative community-based sample of older adults: a total of 3,107 adults were enrolled for the baseline examination in 1992–1993. For each adverse health outcome, a study sample was selected based upon those who had complete follow-up data. Persistent cognitive decline (N = 1271) and mortality (N = 1559) were analyzed over a 13-year period; incident falls (N = 1282) were analyzed over a 3-year period. Cox regression models were used to examine the associations between slowing and time to PCD, falls, and mortality. Slowing in processing and gait speed was standardized in four categories (cutoffs defined as 1 SD below the mean, mean value, and 1 SD above the mean) and then combined to yield a slowing sumscore. The slowing sumscore essentially tested the additive effect of both symptoms. Readers should take note of Table 2, which shows the frequency of PCD, falls, and mortality for each of the seven categories of the slowing sumscore. These raw scores show that the slowing sumscore is correlated with mortality; the greatest number of deaths occurred in the slowest category, and fewer deaths occurred with each subsequent faster category. The distribution of PCD and falls was less linear across the sumscore categories.

Slowed processing speed predicted PCD and mortality. Slowed gait speed predicted falls and mortality. An interaction or synergistic effect between the two slowing indicators emerged, but for falls only. Slowed processing speed predicted falls, but only among adults with the slowest gait speed. The authors conclude that this finding is in line with the dual-task literature: “while slowed gait speed represents (sub)clinical dysfunctioning in several organ

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systems, slowing of processing speed signals a reduced ability to cognitively adapt to new situations. The co-occurrence of slowed gait with slowed processing speed may therefore select a disproportional vulnerable group for falling.” A synergistic effect between processing speed and gait speed did not emerge for PCD or mortality.

The association between slowing and PCD, falls, and mortality was independent of age, sex, educational level, household composition, and alcohol use. This list of potential confounders is certainly not exhaustive; it would be valuable for future studies to consider physical health status, medical comorbidity, and disability, among others, as potential confounders. It may also be helpful to consider the developmental trajectory of slowing. The authors state that “processing speed is an especially early marker of cognitive decline and dementia, while slowing of gait speed follows in a later stage together with decline in other cognitive domains.” Another study<sup>3</sup> similarly suggests that “slowed gait speed occurs secondarily to slowed processing speed” in the path leading to decline, although the authors did not explore this question in the LASA cohort. Slowed processing and slow gait may be part of a common neural circuit. Further research on the relative timing of decline in the two domains would be very valuable.

Depression did not attenuate the associations between slowing and adverse health outcomes. This is an important negative finding consistent with other research.<sup>4</sup> It is surprising in that slowing in thinking and moving would be accompanied, one would think, by slowing in affective processes—the flattening often seen in depressed mood. In this study, the CES-D was used to measure depressive symptoms. It is possible that clinician-administered assessments or a clinical diagnostic interview would be helpful for clarifying the extent to which clinically significant depression (as opposed to psychological distress) affects the relation between slowing and health outcomes. It is also not clear if the authors used the CES-D as a continuous (symptoms count) or categorical variable (0–15 versus 16).

This was the first study to examine the combined contribution of cognitive and motor slowing to adverse health events in older adults. What is next in this line of work? The authors recommend the development of a “slowing index” in research and clinical practice with older adults. Both processing speed and gait speed are clinically relevant and easy to assess. The psychometric properties of the authors’ slowing sumscore were not examined, opening the door to greater refinement of slowing composite scores.

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