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Commentary on Aging and Positive Mood: Longitudinal Neurobiological and Cognitive Correlates

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Some of the most intriguing age-related changes seen in healthy adults are that emotional well-being improves throughout adulthood until leveling off in the 7th decade (Carstensen et al., 2011) and that, compared with younger adults, older adults show a positivity effect in attention and memory (Mather & Carstensen, 2005). Are these changes due to older adults increasing deployment of executive resources to regulate emotion (a 'cognitive-control' account) or to age-related decline in brain regions such as the amygdala that accentuate processing of negative stimuli (the 'aging-brain' account) (Nashiro, Sakaki, & Mather, 2012)? The cognitive-control perspective leads to the counterintuitive hypothesis that older adults who have the best executive functioning should look the most different from younger adults in terms of their emotional well-being and positivity preferences in attention and memory (Mather & Knight, 2005). Furthermore, it suggests that when cardiovascular disease triggers prefrontal white matter damage, older adults will have fewer cognitive control mechanisms available to regulate their emotions, making them more vulnerable to depression (Mather, 2012).

The paper published in this issue by Cotter et al. helps address these issues, as the first study to examine the linkages between declines in white matter integrity, executive function, and changes in well-being in a longitudinal sample of healthy non-depressed adults. In a sample of 716 (327 with neuroimaging data), participants generally showed fewer depression-related symptoms as they got older, an effect that leveled off and appeared to reverse at around age 71. One reason for this curvilinear pattern appears to be that the positive relationship between age and mood was countered by a negative relationship between mood and declines in white matter integrity, executive function and processing speed. Those older adults who showed maintained white matter integrity improved their mood through late life, whereas those with declining white matter integrity (and declining executive function and processing speed) showed declines in mood over time.

These findings are consistent with studies examining the phenomenon of 'vascular depression' in older adults, in which white matter hyperintensities associated with vascular disease lead to both declines in executive functioning and late-life onset of depression that is

Author Contributions

Mara Mather is responsible for the entire manuscript.

Conflict of Interest

There are no conflicts to report.

not responsive to anti-depressant medications (Taylor, Aizenstein, & Alexopoulos, 2013). The current findings provide a potential explanation for why the age-related trend of improved well-being levels off and starts to reverse at around the 7th or 8th decade in life. That is, as people get older, they increasingly prefer to allocate their executive resources to guide attention and memory in ways that optimize current mood. This shift in how executive resources are allocated continues throughout old age. But in some older adults, diminishing executive function capabilities mean that even if executive resources are preferentially allocated to help optimize mood, they are not up to the task and so age-related gains in emotional well-being start to reverse.

The current findings highlight the fascinating nature of emotion and aging. Contrary to most other age-related effects, it is those older adults who are faring best cognitively who differ most from younger adults in terms of their emotional well-being and how they process emotional stimuli (Mather & Knight, 2005). Furthermore, while older adults' positivity effect has been shown to depend on cognitive control resources, it is not something they consciously report focusing on - and it is evident in quite early stages of attention (Kennedy, Huang, & Mather, 2019). Future longitudinal studies should incorporate not only measures of mood and well-being, but also measures of how positive versus negative emotional stimuli are preferentially processed both when cognitive resources are available and when they are consumed by a concurrent task to better understand the fascinating nature of how people use their brains to continue to thrive emotionally as they grow older.

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