# Older beats younger when it comes to correcting mistakes

October 28 2015

Findings from a new study challenge the notion that older adults always lag behind their younger counterparts when it comes to learning new things. The study, published in *Psychological Science*, a journal of the Association for Psychological Science, shows that older adults were actually better than young adults at correcting their mistakes on a general information quiz.

"The take home message is that there are some things that older adults can learn extremely well, even better than young adults. Correcting their factual errors—all of their errors—is one of them," say psychological

scientists Janet Metcalfe and David Friedman of Columbia University, who conducted the study. "There is such a negative stereotype about older adults' cognitive abilities but our findings indicate that reality may not be as bleak as the stereotype implies."

Metcalfe, Friedman, and colleagues were interested in exploring a phenomenon known as the "hypercorrection effect." According to the effect, when people are very confident about an answer that turns out to be wrong, they tend to correct it; when they're initially unsure about the answer, however, they're less likely to correct it. Previous research has shown that the effect is robust in college students and children, but not as strong in older adults.

It's possible that older adults don't show a strong hypercorrection effect because they're not very good at correcting so-called "high-confidence errors." But it could also be that the effect doesn't emerge for older adults because they're actually better than young adults at correcting low-confidence errors.

The researchers wanted to put these possibilities to the test, using both behavioral measures and measures of brain activity to understand participants' performance. They recruited 44 young adults (around 24 years old) and 45 older adults (around 74 years old) to participate in the study. None of the participants had any history or symptoms of neurological or psychiatric disorder or impairment.

The participants were fitted with an EEG cap and presented with a series of general information questions that covered a variety of topics (e.g., "In what ancient city were the Hanging Gardens located?"); they were encouraged to guess when they were unsure but they were allowed to say "I don't know." The participants were asked to rate how confident they were in their response on a 7-point scale, and were then given the correct answer (e.g., Babylon). The brain's electrical activity was measured

while the corrective feedback was displayed. This process continued until the participant had made errors on at least 20 high-confidence and 20 low-confidence answers—on average, this required about 244 questions for the older adults and about 230 questions for the younger adults.

The EEG cap was removed and participants were given a surprise retest. The retest included 20 questions that had led to high-confidence errors, 20 questions that resulted in low-confidence errors, and 20 questions that were not answered.

As expected, the results showed that older adults were better at answering the general knowledge questions—on average, they answered 41% of the questions correctly, while the young adults got only 26% right. Older adults also tended to be more confident in their answers, but both age groups reported greater confidence in the answers they ended up getting right than the ones that they got wrong.

The findings showed that older adults corrected more errors overall than the young adults did, indicating that they were better at updating their existing knowledge with new information. More importantly, they also corrected more of their low-confidence errors. Together, these findings indicate that the older adults were less susceptible to the hypercorrection effect than younger adults were.

And these behavioral results were mirrored by the participants' brain activity. Both age groups showed a larger P3a component—a brain wave indicating attentional processing—for feedback on high-confidence errors than for feedback on low-confidence errors. But, relative to the young adults, older adults produced a larger P3a to low-confidence-error feedback.

According to the researchers, this pattern of results suggests a focus of

attention that reflects the older adults' priorities:

"They care very much about the truth, they don't want to make mistakes, and they recruit their attention to get it right," Metcalfe and Friedman.

The findings may challenge common beliefs about older adults' cognitive abilities, but they also provide a bit of optimism for everyone, regardless of age.

"To be sure, older adults should be heartened by our results—the older adults did splendidly in our study," Metcalfe and Friedman note. "But we all grow old, so younger adults should be encouraged, too."

**More information:** *Psychological Science*, pss.sagepub.com/content/early/ … 97615597912.abstract

Provided by Association for Psychological Science