Metacognition

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Metacognition is thinking about cognition or thinking about thinking. It includes what you know about how your own cognition and cognition in general work. Metacognition also involves the judgments we make about our cognition and how accurate those judgments are. Metamemory and metacomprehension are the most studied areas of metacognition and refer to the judgments we make about our memory and about our reading comprehension, respectively.

Metamemory in the lab is studied by asking people to make one or more types of judgments about how well they think have learned a word or other item and then correlating these judgments with their actual learning. Researchers can look at whether people are overconfident, underconfident, or perfectly calibrated by comparing their average judgments of learning to their average performance. We can also look at how well they can discriminate between items they know well and items they do not know as well by using a special type of correlation called a gamma correlation. It is possible to be overconfident on a task overall but still be good at discriminating between items you know more and less well within a task.

Metamemory and metacomprehension are not abilities that automatically come easily to all of us. In fact, although our abilities naturally improve somewhat as we approach adolescence, people of all ages often need to be explicitly taught how to better judge their cognition. But these metacognitive skills are not always taught in school and many adults still show much room for improvement. Fortunately, metacognitive skills can be improved through training if people are willing to adopt the strategies they are taught.

The first major metacognitive skill that needs to be achieved is theory of mind (ToM), which doesn't occur until around age four. Until then, children mostly lack the ability to attribute mental states to others and to understand that others can have beliefs different from their own (or that others can have false beliefs). This means that very young children are not very good at predicting the behavior of others—they cannot even deceive others by implanting a false belief to get what they want. Even when young children do have some theory of mind ability, they may still have trouble inhibiting beliefs that compete with each other, such as their own and the different beliefs of someone else. (Sometimes children with autism spectrum disorder never achieve adequate theory of mind). The sooner ToM is achieved, the sooner other metamemory skills tend to develop, and language development seems to help facilitate the progress.

As children learn to read and begin studying for tests, they must not only have ToM but an ability to judge what they remember and understand. However, children, especially young ones, tend to be quite overconfident in their memory and comprehension and tend to stay that way even after several cycles of judging their performance. Overconfidence is partly due to wishful thinking, but it is also due to poor monitoring of experiences and performance. Overconfidence in children may be adaptive because if they accurately perceived their abilities they may be discouraged and not put forth the effort needed to develop. Despite overconfidence

in performance on a task overall, children are pretty good at discriminating between what parts of a task they know more and less well. Still, younger children do not usually allocate their study time effectively and choose to study the items they have already learned (especially the easiest ones) rather than spending more time on difficult items. Fortunately, better allocation of study time improves in early adolescence and older children are more likely to know and implement effective strategies as well as implement them more effectively.

You may think that metacognitive skills have been well-honed by the time we reach adulthood, but this is not the case. Although most adults have some ability to accurately judge what they remember and understand, most could benefit from significant improvements. The highest performing college students tend to be a little *underconfident*, but most other students are overconfident, especially the lowest-performing students. Young adults can be trained to improve their metacognition monitoring, which leads to improved regulation and performance, but not all students benefit from this training, for reasons researchers are still exploring. Of note, learning self-efficacy—the belief that you can improve your learning—is more highly correlated with GPA than many other factors. Of course, you have to use effective strategies and work hard, but believing you can improve and do well seems to be essential to good memory and comprehension.

Metacognition in older adulthood is still relatively intact, despite the memory deficits that many older adults experience. Remember that even younger adult metacognitive accuracy is far less than perfect, so older adults can still benefit from metacognitive training (and they usually do unless they are very old). One reason that older adults may not show adequate metacognitive accuracy is that they have lower memory self-efficacy. They tend to believe that their memory is declining and that they have less control over their learning than younger adults do, even when

this may not be true for every individual. Although those who have better memory tend to rate themselves as such, beliefs in cognitive decline may be more based on stereotypes than reality because they do not correlate well with actual abilities. That said, older adults tend to be overconfident when making predictions about their memory, but this is mostly because their memory is worse, as their judgments are not significantly different from those of younger adults. Although older adults are more overconfident when judging their overall performance, they are comparable to younger adults in their ability to judge which items they know more and less well. Older adults struggle most to judge their episodic memories (memories for personally experienced events), particularly the source of a memory, and especially if the frontal lobe of their brain is functioning inadequately. This is probably because older adults tend not to spontaneously orient to enough details (e.g., memory source) when learning and they tend to use a lax criterion for deciding whether their memory is correct or not. Although older adults are similar to younger adults in their ability to judge their memory and comprehension, they tend to be weaker in their ability to regulate their cognition. They are less likely to spontaneously use an effective strategy (like self-testing), but they can implement one effectively when they do. Also, like children, they do not always allocate their study time efficiently. Fortunately, training can improve the metacognition of older adults, but their lower self-efficacy sometimes keeps them from trying as much as they should.

Further Reading:

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