

Chewing Gum May Improve Test Scores

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In 2011, I conducted a study, with assistance from three undergraduates at St. Lawrence University, that showed an improvement in memory in participants who chewed gum for five minutes before completing a battery of cognitive tests, as compared to participants who did not chew gum.

Those who chewed gum showed improvements in their working memory (the ability to hold on to and manipulate information for brief periods of time,) their episodic memory (the ability to retain information long-term,) and in their perceptual speed of processing (a general index of cognitive functioning.) The performance benefits, however, lasted only for 15 to 20 minutes after the gum had been chewed, and were not apparent when gum was chewed throughout testing.

The performance improvement was attributed to a simple idea: Chewing causes an increase in arousal – it helps wake you up. Research suggests that chewing increases heart rate, blood pressure, and cerebral blood flow, and that those changes persist for 15 to 20 minutes afterwards, which coincides with the “window of benefit” revealed in our study.

However, there is some evidence that the act of chewing may also require some of the brain power necessary for maintaining performance, especially on attentionally demanding tasks. So, for those participants who chewed gum throughout testing, the benefits of increased arousal were negated by the need to share brain power between the chewing process and the thinking process.

But, if the chewing is stopped before the testing begins, the benefits due to arousal are more apparent, albeit also time-limited.

So, it may be true that you can't chew gum and think clearly at the same time.

The idea for the study was suggested by Timothy Carr, one of the study's co-authors. Tim developed a proposal to examine the cognitive effects of gum in a class I taught. At that time, I knew very little about the research on gum chewing and cognition, but I was intrigued by the possibility that something as commonplace as this might have tangible benefits on learning.

There have been other studies that observed beneficial effects of different and often unexpected manipulations on cognitive function. For instance, a 1993 study published in the journal *Nature* showed that students who listened to music by Mozart experienced a temporary (15 minutes or less) increase in performance on a spatial reasoning task.

Subsequent research proposed several explanations for this so-called “Mozart Effect,” including the idea that there may be arousal associated with enjoyment of the music – similar to the arousal experienced by gum chewers. Furthermore, a recent review of various studies found that cognitive

functioning improves after short bouts (20 minutes or less) of exercise, which could also be due to a state of arousal.

What are the practical implications of the results?

It seems that chewing gum can be an effective means to “get the blood flowing” before a demanding cognitive test, which could lead to improved test performance. The benefits, however, are of limited duration, and disappear if gum is chewed throughout testing.

Additional research is needed to determine how (and whether) gum chewing can be used as a performance enhancer during testing situations that are more typical of college courses, like exams that are 60 to 90 minutes long.