

# STUDY: Using Cove daily improves cognition

## Background

Your ability to think clearly depends on more than what's going on in your brain. Changes in heart rate or hunger level, for instance, can affect memory, focus, and other aspects of cognition. Indeed, even your most heady reflections are influenced by what's happening elsewhere in your body.

The brain collects data about the organs and limbs through a process called interoception. This "sixth sense" affects how you feel at any given moment and can contribute to a sense of comfort or, alternatively, to stress and anxiety. These feelings may, at times, get in the way of clear-headed thinking. As such, when your sense of interoception is out of whack, your cognition may suffer.

Research indicates that a specific form of physical contact, known as affective touch, can improve interoception. This stimulation promotes activity in a brain pathway that processes interoception and has been linked to feelings of wellbeing. Building on this field of research, our scientists set out to determine whether it is possible to improve cognition by leveraging the brain's affective touch response.

## Hypothesis

We hypothesized that a vibrating device, programmed to generate specific signals, could trigger the brain's affective touch response and, in doing so, enhance cognition.

## Methods

To test our hypothesis, we designed a device that delivers specific slow, light vibrations to the skin behind the ears (i.e., Cove). Earlier studies showed that the device successfully triggers the affective touch response, so we proceeded to more targeted trials. For the present study, we invited 32 volunteers to use Cove twice daily for one month, with each session lasting 20 minutes. The group included 17 females and 15 males, aged 24 to 56. Participation was entirely virtual.

To determine how the device affects cognition, we asked participants to complete a number of cognitive tasks at the beginning and end of the trial. Tasks included Rapid Visual Information Processing (RVP), which measures attention by asking participants to identify a specific number sequence when it appears on a screen. The volunteers also completed a Paired Associates Learning (PAL) challenge, which evaluates learning and visual memory by challenging subjects to remember where different symbols are hidden in virtual space. Finally, participants filled out surveys in which they rated their ability to focus, concentrate, and learn.

## Results

Participants receiving Cove's patented vibrations demonstrated significant improvements in multiple aspects of cognition. Results of the PAL task, for instance, show that after using Cove for one month, participants' visual memory improved by 39% (Figure 1).

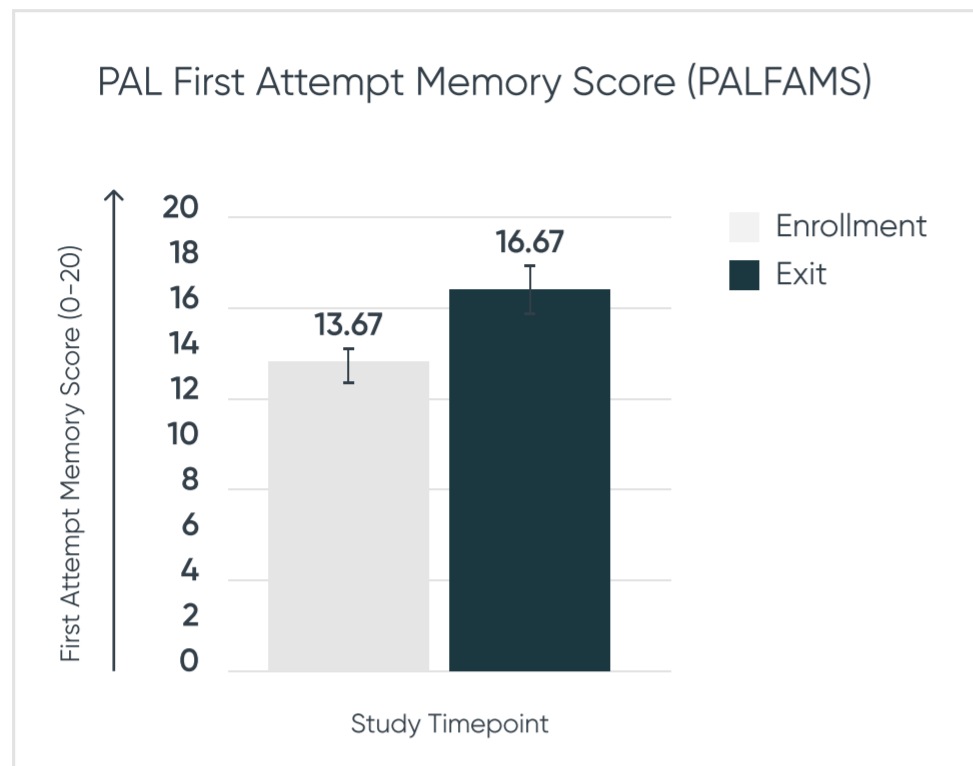


Figure 1. Ability to recall locations on the PAL task before and after one month using Cove.

By the end of the trial, participants also performed better on the RVP task: they responded faster, were more adept at detecting target sequences, and made fewer mistakes (Figure 2). These results indicate that, after using Cove for one month, the volunteers were better at paying attention for an extended period of time.

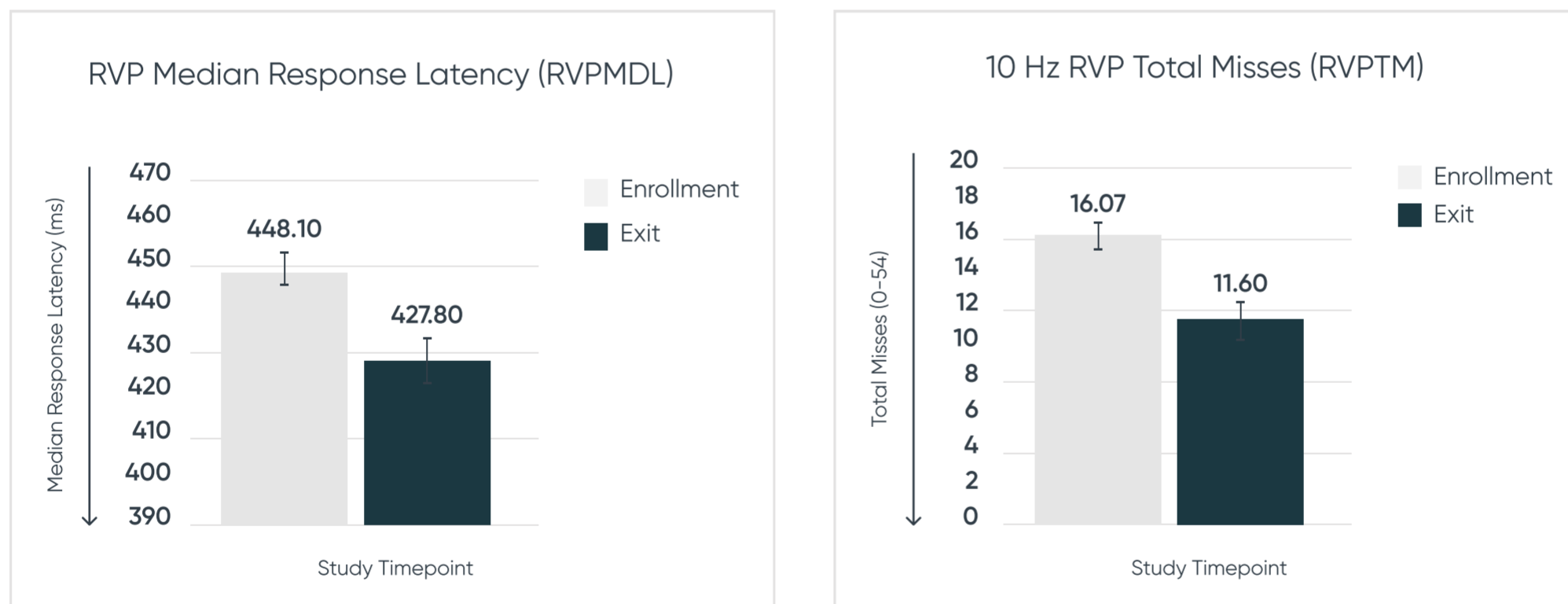


Figure 2. Performance on the RVP task before and after one month using Cove. Graphs show improvement in (a) response time; (b) total missed target sequences.

## Results

Survey results echo these findings. Participants reported that, after their month with Cove, their focus increased by an average of 39%, concentration increased by 16%, and learning capacity increased by 7.5%. When the group was surveyed again 30 days after the study's completion, their focus level remained higher than normal, a finding that may indicate lasting benefits (**Figure 3**). Participants reported no major side effects.

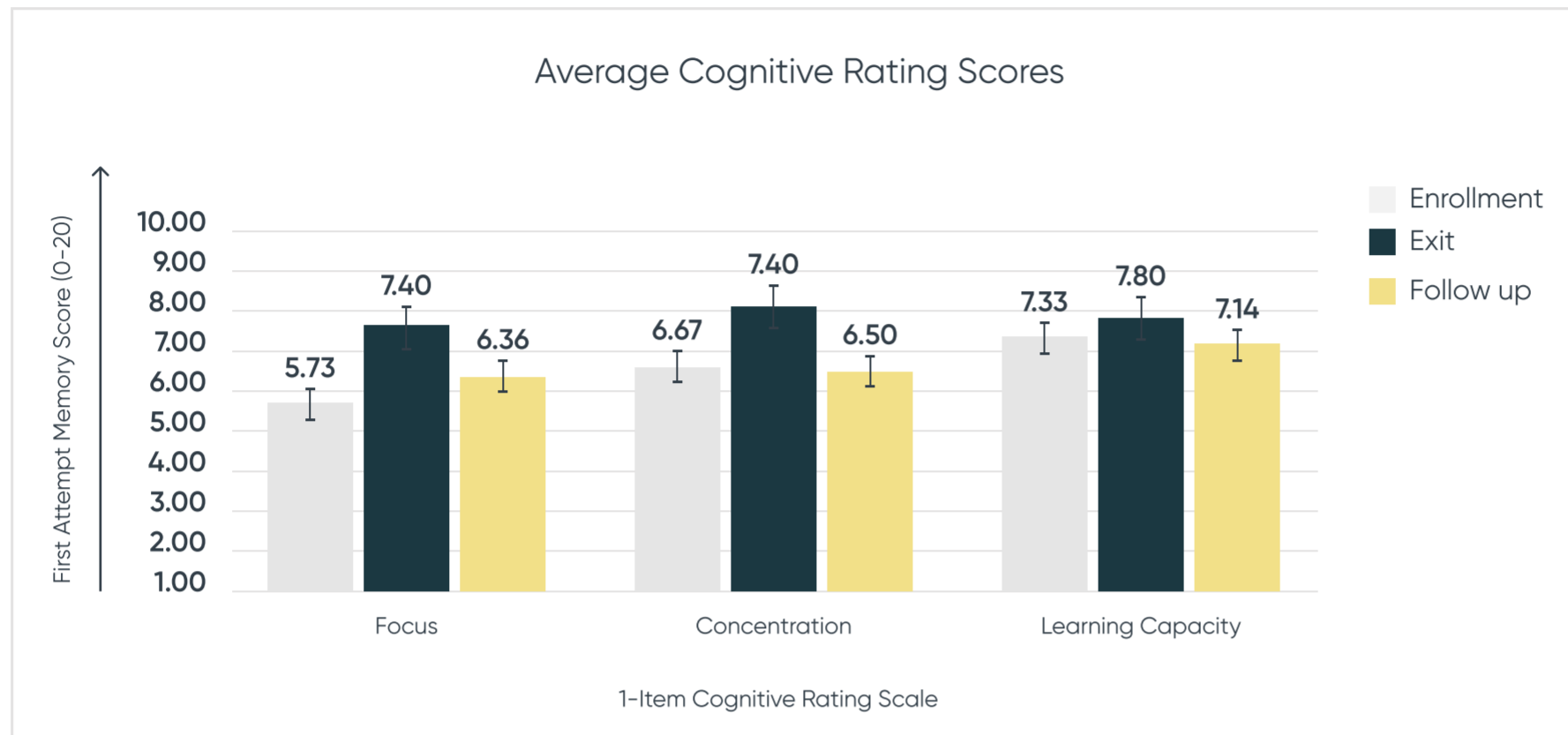


Figure 3. Self-reported ability to focus, concentrate and learn

## Conclusion

Our results show that using Cove consistently for 30 days can lead to several important cognitive benefits. These include improved focus, concentration, visual memory, and learning.