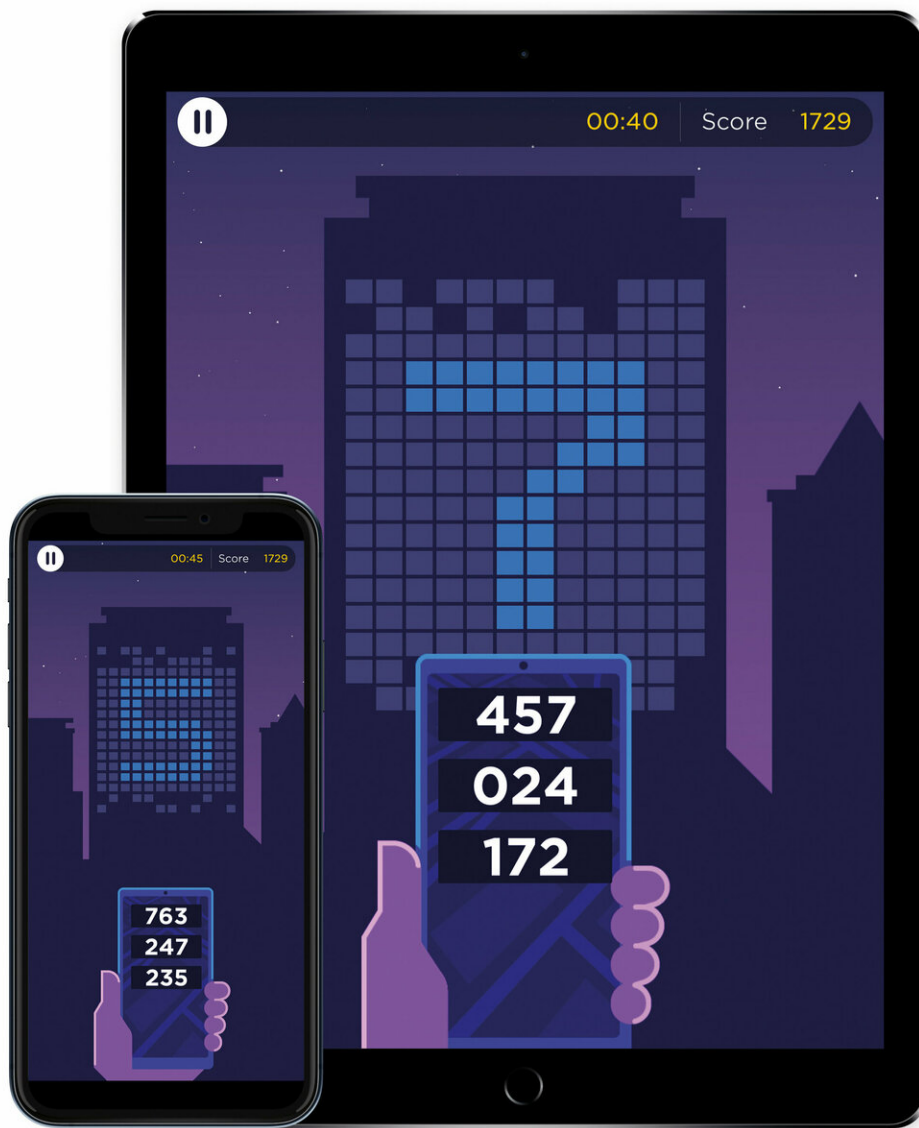


Brain training app improves users' concentration, study shows

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Decoder brain training game on Peak. Credit: Peak

A new 'brain training' game designed by researchers at the University of Cambridge improves users' concentration, according to new research published today. The scientists behind the venture say this could provide a welcome antidote to the daily distractions that we face in a busy world.

In their book, *The Distracted Mind: Ancient Brains in a High-Tech World*, Adam Gazzaley and Larry D. Rosen point out that with the emergence of new technologies requiring rapid responses to emails and texts and working on multiple projects simultaneously, [young people](#), including students, are having more problems with sustaining attention and frequently become distracted. This difficulty in focussing attention and concentrating is made worse by stress from a global environment that never sleeps and also frequent travel leading to jetlag and poor quality sleep.

"We've all experienced coming home from work feeling that we've been busy all day, but unsure what we actually did," says Professor Barbara Sahakian from the Department of Psychiatry. "Most of us spend our time answering emails, looking at text messages, searching social media, trying to multitask. But instead of getting a lot done, we sometimes struggle to complete even a single task and fail to achieve our goal for the day. Then we go home, and even there we find it difficult to 'switch off' and read a book or watch TV without picking up our smartphones. For [complex tasks](#) we need to get in the 'flow' and stay focused."

In recent years, as smartphones have become ubiquitous, there has been a growth in the number of so-called 'brain training' apps that claim to improve cognitive skills such as memory, numerical skills and concentration.

Now, a team from the Behavioural and Clinical Neuroscience Institute at the University of Cambridge, has developed and tested 'Decoder', a new game that is aimed at helping users improve their attention and concentration. The game is based on the team's own research and has been evaluated scientifically.

In a study published today in the journal *Frontiers in Behavioural Neuroscience* Professor Sahakian and colleague Dr. George Savulich have demonstrated that playing Decoder on an iPad for eight hours over one month improves attention and concentration. This form of attention activates a frontal-parietal network in the brain.

In their study, the researchers divided 75 healthy young adults into three groups: one group received Decoder, one control group played Bingo for the same amount of time and a second [control group](#) received no game. Participants in the first two groups were invited to attend eight one-hour sessions over the course of a month during which they played either Decoder or Bingo under supervision.

All 75 participants were tested at the start of the trial and then after four weeks using the CANTAB Rapid Visual Information Processing test (RVP). CANTAB RVP has been demonstrated in previously published studies to be a highly sensitive test of attention/concentration.

During the test, participants are asked to detect sequences of digits (e.g. 2-4-6, 3-5-7, 4-6-8). A white box appears in the middle of screen, of which digits from 2 to 9 appear in a pseudo-random order, at a rate of 100 digits per minute. Participants are instructed to press a button every time they detect a sequence. The duration of the test is approximately five minutes.

Results from the study showed a [significant difference](#) in attention as measured by the RVP. Those who played Decoder were better than those

who played Bingo and those who played no game. The difference in performance was significant and meaningful as it was comparable to those effects seen using stimulants, such as methylphenidate, or nicotine. The former, also known as Ritalin, is a common treatment for Attention Deficit Hyperactivity Disorder (ADHD).

To ensure that Decoder improved focussed attention and concentration without impairing the ability to shift attention, the researchers also tested participants' ability on the Trail Making Test. Decoder performance also improved on this commonly used neuropsychological test of attentional shifting. During this test, participants have to first attend to numbers and then shift their attention to letters and then shift back to numbers. Additionally, participants enjoyed playing the game, and motivation remained high throughout the 8 hours of gameplay.

Professor Sahakian commented: "Many people tell me that they have trouble focussing their attention. Decoder should help them improve their ability to do this. In addition to healthy people, we hope that the game will be beneficial for patients who have impairments in attention, including those with ADHD or traumatic brain injury. We plan to start a study with traumatic brain injury patients this year."

Dr. Savulich added: "Many brain training apps on the market are not supported by rigorous scientific evidence. Our evidence-based game is developed interactively and the games developer, Tom Piercy, ensures that it is engaging and fun to play. The level of difficulty is matched to the individual player and participants enjoy the challenge of the cognitive training."

The game has now been licensed through Cambridge Enterprise, the technology transfer arm of the University of Cambridge, to app developer Peak, who specialise in evidence-based 'brain training' apps. This will allow Decoder to become accessible to the public. Peak has

developed a version for Apple devices and is releasing the game today as part of the Peak Brain Training app. Peak Brain Training is available from the App Store for free and Decoder will be available to both free and pro users as part of their daily workout. The company plans to make a version available for Android devices later this year.

"Peak's version of Decoder is even more challenging than our original test game, so it will allow players to continue to gain even larger benefits in performance over time," says Professor Sahakian. "By licensing our [game](#), we hope it can reach a wide audience who are able to benefit by improving their attention."

Xavier Louis, CEO of Peak, adds: "At Peak we believe in an evidenced-based approach to brain training. This is our second collaboration with Professor Sahakian and her work over the years shows that playing games can bring significant benefits to brains. We are pleased to be able to bring Decoder to the Peak community, to help people overcome their [attention](#) problems."

More information: George Savulich et al, Improvements in Attention Following Cognitive Training With the Novel "Decoder" Game on an iPad, *Frontiers in Behavioral Neuroscience* (2019). [DOI: 10.3389/fnbeh.2019.00002](#)

Provided by University of Cambridge

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