

Our dependence on digital devices may affect sleep and memory

June 26 2014, by Clio Korn



Credit: Levent Simsek from Pexels

As smartphones have become ubiquitous, parents and teachers have [voiced concerns](#) that a technology-rich lifestyle is doing youngsters harm. Research on this question is still in its infancy, but other branches

of study can give us a clue to what we are likely to find. Studies on stress, sleep and memory suggest how modern technology might influence our brains and behaviour.

Need for speed

The speed of [modern technology](#) requires us to process more information in a given amount of time than before. This effect is enhanced when we use multiple devices at once. This intensity of stimulation, and the speed of [information processing](#) it requires, affect the nervous system in different ways.

Such stimulation activates the body's stress response system in order to allow us to deal effectively with the situation. That response evolved in humans to deal with immediate stressors, such as being chased by a predator. It is beneficial when the stress, or intense stimulation, is short term. For an athlete about to compete, a student about to sit an exam, or a lawyer about to cross-examine a witness, the burst of adrenaline and focus that the stress response provides are useful to successfully completing the task at hand.

However, there is a [growing body of evidence](#) that chronic activation of this system can be damaging to our health. The stress response affects all sorts of body functions, from how we store energy to how our immune systems work, and continuous activation of this response may influence our susceptibility to eating disorders, [autoimmune diseases](#), depression and addiction.

Given how continuous and rapid-fire this stimulation often is, it is likely that our use of technology is engaging our [stress response](#) system. If that's the case, this is a prime route by which technology could alter brain function and behaviour.

No rest, no peace

A second avenue by which technology use could affect our brains and behaviour is [sleep](#). Sleep deprivation and disruption affects [memory](#), [executive function](#) and [mood](#). People now sleep [significantly less](#) than they used to, and this is particularly true of [younger generations](#). Increased use of computers and mobile phones, especially just before bed, is [correlated](#) with increased [sleep disruption](#), suggesting that use of these technologies may be contributing to the epidemic levels of [sleep deprivation](#) our society is now experiencing.

Presented with the limitless information and entertainment available on the Internet, it can be hard to turn away from the next TV episode, YouTube video, or Facebook update and make ourselves go to sleep. The Onion's [recent satire](#) – Man honestly thinks he is going to bed early – rings awfully true.

Scattered memories

In addition to indirect effects on the brain via sleep and stress, [technology](#) could have more direct effects too. Working memory is a [limited resource](#), and the precision with which information is stored [decreases as working memory load increases](#). Our propensity to use different technologies all at once might therefore [affect memory and attention](#).

Sometimes the speed and intensity of our digital lifestyle may be useful. For example, research suggests that training on [working memory](#) tasks [enhances people's ability to focus their attention](#). So perhaps juggling multiple technologies simultaneously enhances our ability to multitask.

At the moment, we can't be sure whether our use of digital devices will have a positive or negative effect. The development of modern technologies has been too fast for research on their effects to keep up. But it should catch up before too much harm is caused.

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