

Brain drain – A smartphone side-effect

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Smartphone has become an essential part of our daily life since it was [first introduced in 1994 by the International Business Machines Corporation \(IBM\)](#) [1]. Since its beginning, researchers have conducted numerous studies on its effects on our daily life. Along with the development of new technologies applied to a smartphone, the frequency that users interact with their phones also increased, leading to more impacts on human behaviors.

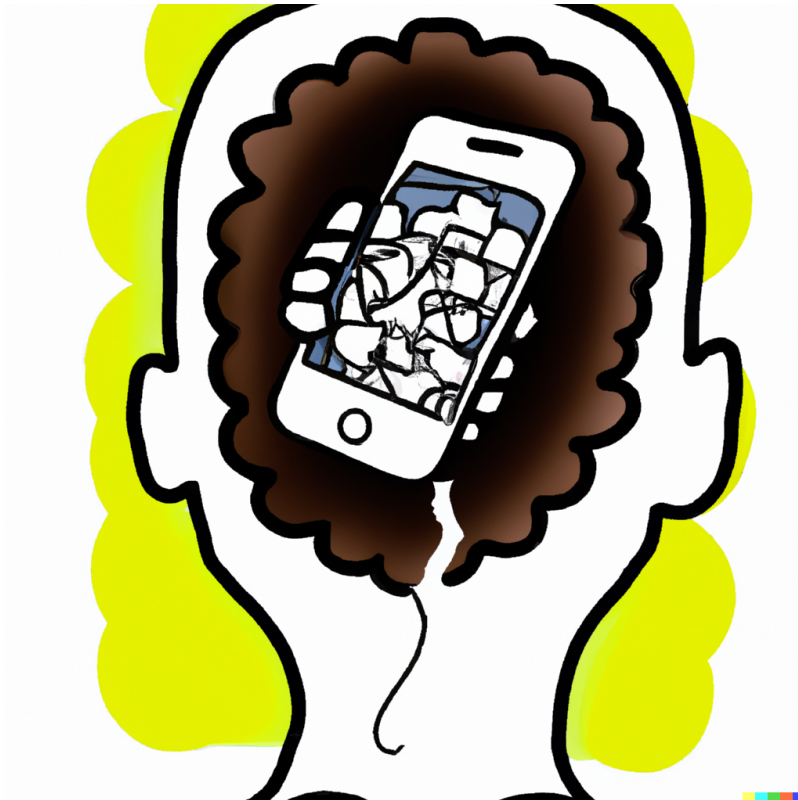


Illustration: Smartphone and brain drain, generated by openAI DALL•E 2, instructed by QH Vuong (January 31, 2023)

[A 2017 study published](#) in the *Journal of the Association for Consumer Research* discovered that the presence of smartphones adversely affects the human brain's cognitive capacity [2]. The researchers conducted two experiments.

In the first experiment, they tested the influence of the presence of a smartphone on the available cognitive capacity by asking the 520 undergraduates to place their devices in different places. Each place corresponds to a different level of salience; for example, nearby and in sight (high salience), nearby and out of sight (medium salience), or in a separate room (low salience). The second experiment replicated the design of the first experiment on a sample of 275 undergraduates and measured their reliance on the smartphone.

The results showed that the presence of a smartphone in working places adversely affects available cognitive capacity as measured by the available working memory capacity and functional fluid intelligence. Such an adverse effect becomes more substantial when smartphone salience increases. Even when people can sustain their attention, such as resisting checking their phones, the mere existence of the smartphone still diminishes their available cognitive capacity. The adverse effects were also found to be more significant among people with higher smartphone dependence.

Viewing the finding from the [information processing perspective](#) of the mindsponge theory is relatively reasonable. According to the theory, a human mind can be deemed an information collection-cum-processor, and its processing capacity (including cognitive capacity and energy) is limited [3]. Owning a phone makes the person process information relevant to the phone (e.g., expecting texts, phone calls, etc.), which consumes the mind's available cognitive resources and energy. When the phone's existence is more salient, or the person is more reliant on the phone, the phone-related information a mind processes will likely increase, leading to the more severe brain-drain effect.

References

[1] Smith R. (2018). [IBM created the world's first smartphone 25 years ago](#). *World Economic Forum*.

[2] Ward AF, et al. (2022). [Brain drain: The mere presence of one's own smartphone reduces available cognitive capacity](#). *Journal of the Association for Consumer Research*, 2(2), 137-266.

[3] Vuong QH. (2023). [Mindsponge theory](#). De Gruyter.



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