

# The mind as a sponge, cognitive artifacts, and being in the 21<sup>st</sup> century

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October 5, 2020

## The analogy of a mind as a sponge

In daily conversation, we often analogize the mind to a sponge, especially for people who excel at learning. Of course, the mind is much more complex than a sponge. But this analogy still intuitively captures three major aspects of learning: 1) If your mind is not flexible and open, it cannot learn effectively; similarly, a good sponge needs to be soft and flexible; 2) If your mind is soaked with new information, it has to “squeeze out” some of it in order to effectively absorb new things; 3) After learning new things, the mind changes, which is similar to the sponge as its color or shape changes, however slightly, after one cycle of absorbing and squeezing.

## The mindsponge model

In the mindsponge model, the mind is compared to a sponge that squeezes out unsuitable values and absorbs new ones that are compatible with its core value (Vuong, 2016; Vuong & Napier, 2015). The mindsponge process is conceptualized to address the

questions on innovation and creativity that emerge in the context of acculturation. Thus, it is first discussed in terms of the addition and subtraction of values.

The mindsponge model is much more complex and nuanced than the intuitive analogy of a mind as a sponge mentioned above. According to Vuong and Napier (2015), a mindsponge model has three layers. The innermost is the core, where core values reside. Next is the buffering zone, which serves two functions: sheltering the core from external cultural shocks caused by new values coming in and filtering these values. Finally, there is an external environment, which is the cultural and ideological setting of a mind. Every two layers have a contact point representing where the new values and beliefs are evaluated. This is where new values and beliefs are either acknowledged or rejected.

The mindsponge model goes beyond a mere analogy in that it shows there will also be novel cultural values that come around and get attached to the buffering zone. And whether consciously or not, a mind will have to decide whether to reject these values or integrate them as a part of the core. The mindsponge model represents the ever-changing, dynamic mental processes of values filtering and selection. They are constantly running in the background of one's mind.

Here, I think the model is well-equipped to address the questions of learning and information: How does a mindsponge filter out information? How does it absorb new information? How does the newly absorbed information become parts of the core mindset, determining the next learning process? Before moving further, I want to introduce the concept of cognitive artifacts.

## Cognitive artifacts: Our choices matter

David Krakauer, the president of one of the most advanced institutes of the scientific studies of complexity—the Santa Fe Institute, California, USA, is known for distinguishing two kinds of cognitive artifacts (CA): *complimentary cognitive artifacts* and *competitive cognitive artifacts*. The example Krakauer uses to illustrate a complementary cognitive artifact is the abacus. When one masters it, it will become an integral part of how his or her mind works and will facilitate his thinking. In contrast, a calculator is an example of a competitive cognitive artifact. When a person starts using this kind of tool, his ability to do the calculation in his mind is diminished (Krakauer, 2016).

Krakauer took the inspiration from Donald Norman (1991), the director of the Design Lab, California, San Diego, who is among the first to notice much of the scientific understanding in during his time had been devoted to the unaided mind: the issues of memory, attention, action, and thought. But careful works in cognitive science on how the artifacts of culture can shape the mind had been neglected. In recent years, there has been a substantial improvement in this field, with a large literature devoted to the extended mind and cognitive artifacts (Heersmink, 2013, 2017; Fasoli, 2018). Krakauer argues our relationship with AI will be defined by our choices in designing and using these smart recommender algorithms.

## Minds in the 21st century

We live in an age where some of the best minds on earth, spending all their time designing algorithms that are good at gaming our attentions. Billion of dollars has been

spent each year to further fine-tune these AI systems that read our emotions and suggest us what to buy, what to read, what to do, where to eat, and some worry, ultimately, what to think (McStay, 2018; Zuboff, 2015, 2019). These AI systems, or at least their future versions, might be considered the ultimate cognitive artifacts, the ones being are created to mirror our process of cognition. If Bostrom were right about the inevitability of superintelligence, AI would eventually replace us as thinkers (Bostrom, 2014).

But my issue with framing the problem as a strict binary category of complementary and competitive artifacts is that it seems to diminish the *human choice* in choosing what to do with his mind. Although to be fair, Krakauer devises such categories to warn us about the choices we make when designing and integrating the current AI systems into our lives. It seems to me whether an object can complement or compete with one's ability to think is entirely the choice of the subject. For example, once a scientist learns the art of statistics, he can either become a "*regression monkey*" or a "*p-hacker*" or a "*star-gazer*" (Vuong, Ho, & La, 2018). Or he can decide to leverage his new mastery to enhance her capacity to reason, analyze, and synthesize about problems that her statistical models might not be able to address (Vuong et al., 2018; Vuong et al., 2020).

To take care of your mind is all about allowing new ideas to get attached to the buffering zone and ensuring the core is flexible enough to let in good ideas. Here, one must be relentlessly self-reflectively disciplined to observe, question, and understand the core of his mind, and challenge himself to grow when new ideas come around. When new cognitive artifacts are being introduced to the mind, Vuong and Napier (2015) use the *inductive attitude* and the *3D method of creativity* (in-discipline expertise, out-of-

discipline insights, and disciplined process) to untangle this process of continual filtering and selecting of information.

Human beings in the 21<sup>st</sup> century, more than any other time in human history, face a unique set of challenges to flourish. Technologies have allowed us faster access to everything but also the existential angst of missing out. Technologies can afford us more time to do things that matter to us, but they are also presenting us with a sea of distractions from those exact things. If we let our core values being dominated by techno-determinism, our fate as being replaced by machines seems certain. The way forward is to reexamine our core values, observe and get to know our mind better, and to leverage the advanced cognitive artifacts afforded for us by the Second Machine Age (Brynjolfsson & McAfee, 2014) to become more creative and productive thinkers.

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