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Op-Ed

Human memory: What did *you* do last Sunday?

Why is it so hard to recall mundane events? Because they are mundane.

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I recently enlisted a friend to sit down with me while waiting for our boys to finish a class one Saturday, and we each tried to remember what we had done on the previous Sunday. It was an agonizing exercise that resulted in a blank. I could almost feel the cognitive path my mind was taking, and it always ended with a wall.

Conversations with our respective wives revealed that my friend had spent most of his Sunday on the phone with a computer customer service representative, while I was navigating around giant ketchup bottles at Costco. No wonder we couldn't remember. We tried the same spontaneous memory test again the following week, with the same troubling outcome.

It seems that we are being robbed of the vast majority of our past on a regular basis. We live it and it's gone. Why doesn't more of it stick in memory?

One common assumption in cognitive psychology and neuroscience is that we cannot possibly remember everything because our brains would not be able to hold memories of each and every experience and perception over a lifetime. Instead, we store in long-term memory only what is important. But how does the brain determine what is "important" enough to remain in memory?

Before thinking of memory as a scientist, I used to view it as a mental photo album, there to help me reminisce about precious moments (or dwell on negative ones). But memory is actually more a survival tool than an entertainment platform. We use our experiences, as captured in memory, to anticipate and prepare for upcoming events and encounters. We are all pretty successful fortune tellers: We know what to pack when going on a beach vacation in a new destination; we know which friends will get along well when planning a dinner party. And when an old "friend" from high school finds us on Facebook, we have a good idea of how the interaction will unfold, from the "Is it really you?" to the "Let's meet for coffee."

This ability to predict is inherent to the way our brains work. We find analogies between new situations and familiar scenarios, and prepare to act with high precision. Let's say you get a phone call and an unfamiliar voice asks how you are doing. The background noise tells you that it is a telemarketing call. It does not matter that it is a new person, or that what he is offering is new to you, the situation is similar to many you have already experienced. Once you have recognized this similarity, you execute the same series of actions you have executed numerous times before (apologizing for being too busy to talk, say, or expressing your lack of interest and then hanging up). You do not need much time to weigh your options. You act automatically based on a template of behavior built from experience and stored in memory. This tendency to connect with memory, generate predictions and then perform a familiar action saves us a lot of time and energy, and in some cases, saves our lives.

The scaffoldings for predictions are built on experiences, but these do not necessarily have to be real experiences. Another way to generate "experiences" is through simulated, imagined scenarios, which can later be retrieved as needed just like actual memories.

As we all know from daydreaming, the brain is a spectacular screenwriter. But mind wanderings are not as aimless as they might seem, and discovering their function has been the focus of exciting new research.

When your mind wanders, it often wanders to imagining plausible scenarios that have not yet happened, like what you would do if upon landing you discover that the airline has lost your luggage and you are scheduled to give a talk in two hours. It has not happened, but if it does, you will be ready. Better yet, if you ran this simulation in your mind early enough, you might have packed extra clothes and other essentials for your talk in your carry-on. Such mental simulations are the vehicle of our planning abilities.

Because the brain is such a proactive, relentless generator of predictions, it is always on the lookout for something new. Other than cues of threat in our surroundings, novelty is the most attractive type of input for our brains. (Like many other facts about the human mind, our attraction to novelty has been known to advertisers for ages, judging by the omnipresent "New!" labels on so many not-so-new products.)

In fact, novelty is the primary, if not the primal, trigger of learning. What we learn, what stays in memory, are novel bits of information about our universe, which enrich the pool of scenarios on which we can later produce predictions. And thus, our ability to produce accurate predictions and minimize uncertainty increases with exposure to the new.

So the simple answer to why my friend Roman and I could recall so little from last Sunday is that there was no reason to etch the day into memory; not much had happened that had not happened before. Certainly, nothing is wrong with a pleasant routine, except that there is nothing memorable about it.

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