

Opinion: How the brain stops us learning from our mistakes, and what to do about it

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You learn from your mistakes. At least, most of us have been told so. But science shows that we often fail to learn from past errors. Instead, we are likely to keep repeating the same mistakes.

What do I mean by mistakes here? I think we would all agree that we quickly learn that if we put our hand on a hot stove, for instance, we get burned, and so are unlikely to repeat this mistake again. That's because

our brains create a threat-response to the physically painful stimuli based on past experiences. But when it comes to thinking, behavioral patterns and decision making, we often repeat mistakes—such as being late for appointments, leaving tasks until the last moment or judging people based on first impressions.

The reason can be found in the way our [brain](#) processes information and creates templates that we refer to again and again. These templates are essentially shortcuts, which help us make decisions in the real world. But these shortcuts, known as heuristics, can also make us repeat our errors.

As I discuss in my book [Sway: Unravelling Unconscious Bias](#), humans are not naturally rational, even though we would like to believe that we are. Information overload is exhausting and confusing, so we filter out the noise.

We only see parts of the world. We tend to notice things that are repeating, whether there are any patterns or not, and we tend to preserve memory by generalizing and resorting to type. We also draw conclusions from sparse data and use cognitive shortcuts to create a version of reality that we implicitly want to believe in. This creates a reduced stream of incoming information, which helps us connect dots and fill in gaps with stuff we already know.

Ultimately, our brains are lazy and it takes a lot of cognitive effort to change the script and these shortcuts that we have already built up. And so we are more likely to fall back on the same patterns of behaviors and actions, even when we are conscious of repeating our mistakes. This is called confirmation bias—our tendency to confirm what we already believe in, rather than shift our mindset to incorporate new information and ideas.

We also often deploy "[gut instinct](#)"—an automatic, subconscious type of

thinking that draws on our accumulation of [past experiences](#) while making judgements and decisions in new situations.

Sometimes we stick with certain behavior patterns, and repeat our mistakes because of an "[ego effect](#)" that compels us to stick with our existing beliefs. We are likely to selectively choose the information structures and feedback that help us protect our egos.

One experiment found that when people were reminded of their successes of the past, they were more likely to [repeat those successful behaviors](#). But when they were conscious of or actively made aware of their failures from the past, they were less likely to overturn the pattern of behavior that led to failure. So people were in fact still likely to repeat that behavior.

That's because, when we think of our past failures, we are likely to feel down. And in those moments, we are more likely to indulge in behavior that makes us feel comfortable and familiar. Even when we think carefully and slowly, our brains have a bias towards the information and templates we had used in the past, regardless of whether these resulted in errors. This is called the [familiarity bias](#).

We can learn from mistakes though. In one experiment, monkeys and humans had to watch noisy, moving dots on a screen and judge their net direction of movement. The researchers found that both slowed down after an [error](#). The larger the error, the longer the post-error slowing, showing more information was being accumulated. However, the quality of this information [was low](#). Our cognitive shortcuts can force us to override any new information that could help prevent repeating mistakes.

In fact, if we make mistakes while performing a certain task, "frequency bias" makes us likely to repeat them whenever we do the task again.

Simplistically speaking, our brains start assuming that the errors we've previously made are the correct way to perform a task—creating a habitual "[mistake pathway](#)". So the more we repeat the same tasks, the more likely we are to traverse the mistake pathway, until it becomes so deeply embedded that it becomes a set of permanent cognitive shortcuts in our brains.

Cognitive control

It sounds bleak, so what can be done?

We do have a [mental ability](#) that can override heuristic shortcuts, known as "cognitive control." And there are some [recent studies in neuroscience with mice](#) that are giving us a better idea of what parts of our brains are involved in that.

Researchers have also [identified two brain regions](#) with "self-error monitoring neurons"—brain cells which monitor errors. These areas are in the [frontal cortex](#) and appear to be part of a sequence of processing steps—from refocusing to learning from our mistakes.

Researchers are exploring whether a better understanding of this could help with development of better treatments and support for Alzheimer's, for example, as preserved cognitive control is crucial for [well-being in later life](#).

But even if we don't have a perfect understanding of the brain processes involved in cognitive control and self-correction, there are simpler things we can do.

One is to become more comfortable with making mistakes. We might think that this is the wrong attitude towards failures, but it is in fact a more positive way forward. Our society denigrates failures and mistakes,

and consequently we are likely to feel shame for our mistakes, and try and hide them.

The more guilty and ashamed we feel, and the more we try and hide our mistakes from others, the more likely we are to repeat them. When we not feeling so down about ourselves, we are more likely to be better at taking on new information that can help us correct our mistakes.

It can also be a good idea to take a break from performing a task that we want to learn how to do better. Acknowledging our failures and pausing to consider them can help us reduce frequency bias, which will make us less likely to repeat our [mistakes](#) and reinforce the mistake pathways.

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