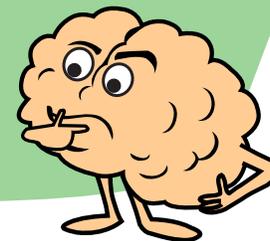


WHY DO PEOPLE KEEP GAMBLING EVEN WHEN IT'S NOT FUN ANYMORE?



Have you ever wondered why people who have a gambling problem continue to gamble even though they don't like it and don't want to do it anymore? Here, we'll describe what parts of the brain are involved in keeping a habit like gambling going, even when it's no longer enjoyable.

THE REWARD NETWORK

In our brains, we have a Reward Network that includes two important parts – the Ventral Striatum and the Dorsal Striatum (see *Figure 1*).

The **Ventral Striatum**, also known as the '**Reward Hub**', allows us to experience pleasure. The Reward Hub lights up when we want something or when we anticipate that something will be rewarding. The Reward Hub is much like the gas pedal in a car. When gambling becomes a problem, it's like we keep pressing that gas pedal to the extreme in order to feel pleasure.

The **Dorsal Striatum**, also known as the '**Habit Hub**', helps us to establish habits. When we over-engage in pleasurable behaviours, brain activity shifts from the Reward Hub to the Habit Hub as a habit is formed. These two parts of the brain normally work together in harmony. This way we can experience pleasure, but also quickly develop habits out of these experiences so that we can repeat them.

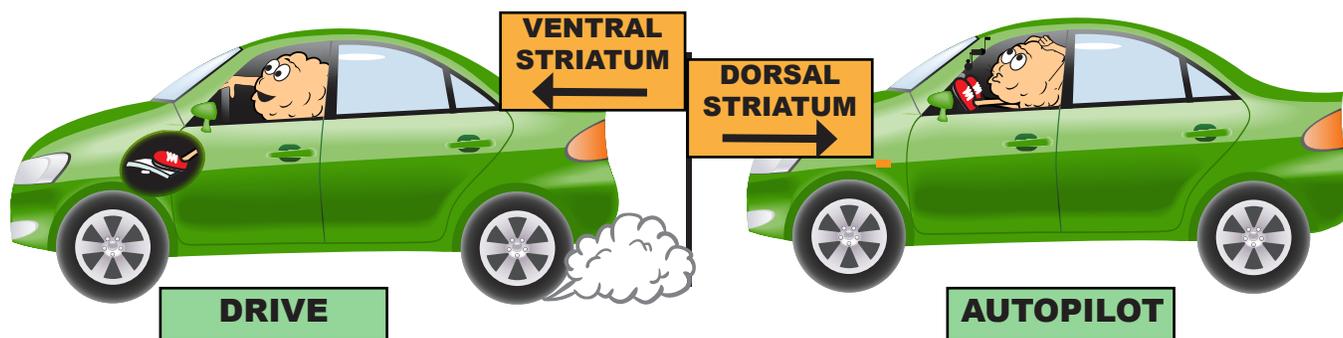


Figure 2

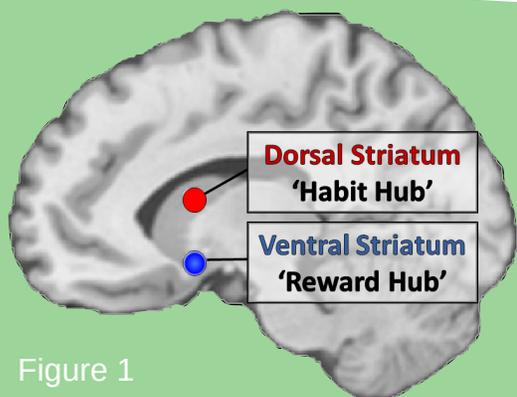


Figure 1

When gambling becomes a problem, researchers believe that the Reward Hub and the Habit Hub stop working together harmoniously. The gas pedal gets pressed too much and, all of a sudden, we are now in the habit of gambling. This change in the brain results in three things: (1) people with gambling problems become overly aware of gambling cues, (2) this over-awareness causes strong urges to gamble; (3) but when people actually gamble, they will feel less pleasure in gambling because it is now a habit. Let's take a closer look at these discoveries.

LESSONS FROM SUBSTANCE USE RESEARCH

Much of what we know about the shift from the Reward Hub to the Habit Hub comes from research in the field of substance use. Researchers find that the brain rapidly associates specific stimuli (such as seeing alcohol or drugs) with reward^{1,2}. For example, if someone with an alcohol use problem sees a bottle of wine, she associates past feelings of pleasure or reward with the wine and will want to drink it. This pleasurable association has been formed over many drinking occasions and is so strong that it can override other thoughts about why she should not drink.

The same thing can happen with a gambling problem. As a person gambles, she starts to associate gambling cues (e.g., the sounds of a slot machine, the feel of felt on a poker table, her favourite numbers) with a reward, such as money. She likes the feeling she gets with the reward, so she gambles again and again to feel that pleasure. She keeps pressing the 'gas pedal,' lighting up the Reward Hub.

GETTING IN THE HABIT

So, why doesn't the pleasure of gambling last? Because the brain quickly learns what it needs to do in order to get a reward. And, as behaviours become well-learned, engaging in them no longer lights up the Reward Hub. Instead, the Habit Hub is activated³. Once a behaviour becomes a habit, it is almost automatic – we don't really have to think about it anymore and it is not as pleasurable as it once was. Not only is gambling less pleasurable when the Habit Hub is in charge, but it is also more likely that one's attention will be hijacked by gambling cues (see *Figure 3*). For example, people with gambling problems are faster at recognizing gambling-related cues compared to neutral ones⁴. This explains why someone with a gambling problem would more quickly notice an advertisement for a new casino than one for a new restaurant.

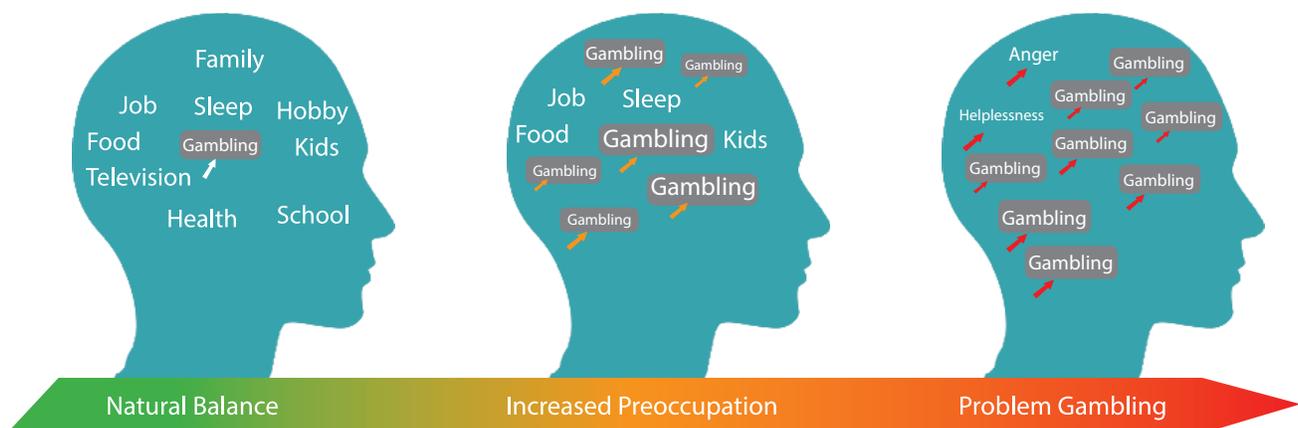


Figure 3 INCREASED ATTENTION TO GAMBLING CUES AS PROBLEM GAMBLING DEVELOPS.

¹ Everitt & Robbins (2005). *Nature neuroscience*, 8(11), 1481-1489.

² Robinson & Berridge (1993). *Brain research reviews*, 18(3), 247-291.

³ O'Doherty et. al., (2004). *Science*, 304(5669), 452-454.

⁴ Brevers et. al., (2011). *Psychology of addictive behaviors*, 25(4), 675; Brevers et. al., (2011). *Journal of behavior therapy and experimental psychiatry*, 42(3), 265-269.

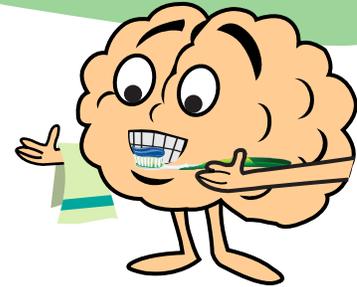
LIKING AND WANTING

When gambling becomes a habit, gambling cues are processed faster and they trigger very powerful urges to gamble.

Consider this example: if you have a gambling problem, just seeing money can be a trigger to gamble. As shown in Figure 4, when gambling becomes a habit, there is a switch from 'liking' to 'wanting'. This switch happens when the Habit Hub overrides the Reward Hub. At this point, you want to gamble (your Habit Hub is active) but you don't even like it anymore (your Reward Hub is weakened). People in problem gambling treatment often experience this effect – they feel a strong desire to gamble but it is no longer for fun or entertainment. Instead of feeling pleasure, gambling is used to ease the discomfort of urges.

SOME HABITS CAN BE GOOD

You might wonder why the Ventral-to-Dorsal Striatum shift happens at all, especially when bad habits or addictions can be so damaging. The reason is that many habits can actually be good for us, providing mental shortcuts so our brains can focus on other things. For example, as children, we quickly learned how to brush our teeth and it was fun. Now, as adults, brushing our teeth is fairly routine and automatic. This habit is a healthy shortcut – consider all the other things your brain was freed up to think about while brushing your teeth this morning!



Gambling Effects on the Brain

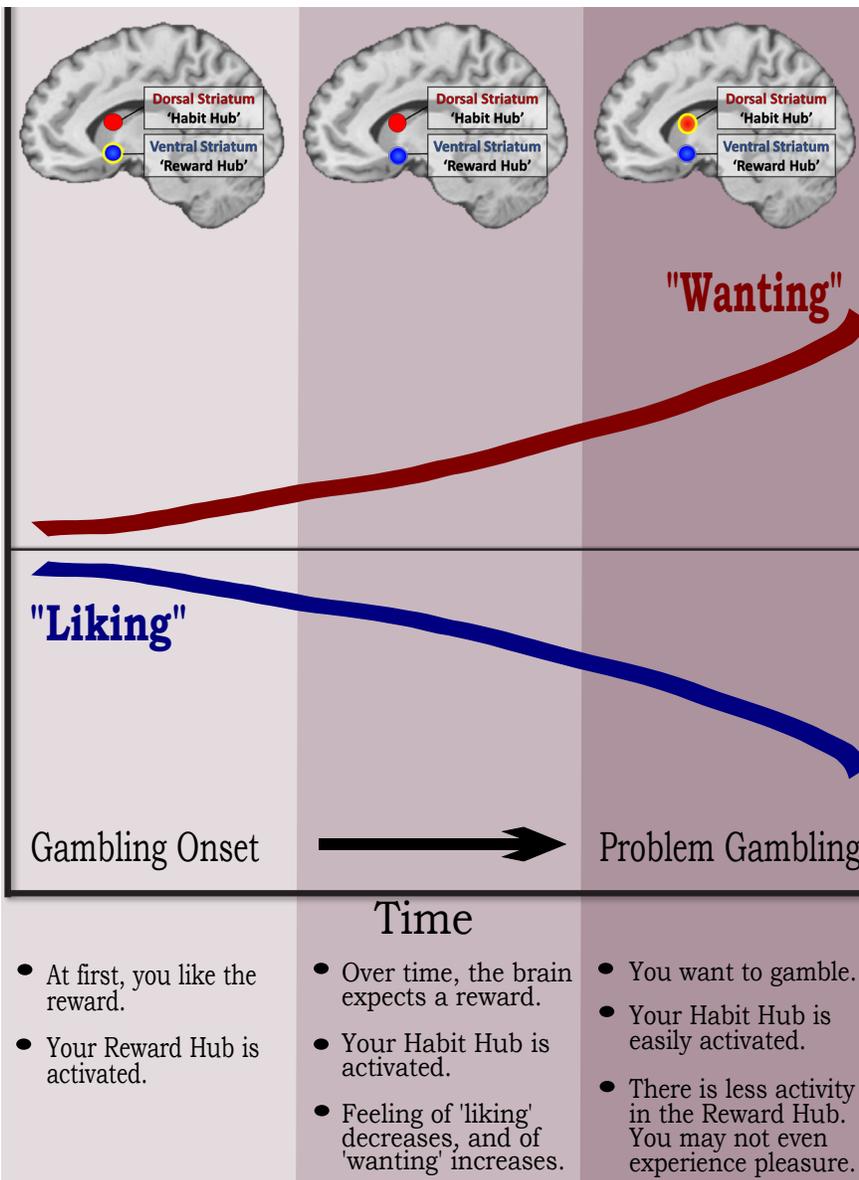


Figure 4
THE SHIFT FROM 'LIKING' TO 'WANTING'.

Initially, gambling is pleasurable but, over time and with increased gambling, the feeling of 'liking' decreases and the 'wanting' takes over.

ACTIVITY:

Can you see at what point the Habit Hub overrides the Reward Hub?

1. "This is my first time gambling – that was a fun night out!"
2. "I've gambled a few times this month and I'm excited to go again, whenever that might be."
3. "I gamble every Friday night – it's my main fun for the weekend."
4. "I have been gambling every day for months... it's not really fun anymore and I'm not sure why I'm still going."
5. "I hate gambling but I feel like I can't stop. The urges are so strong."

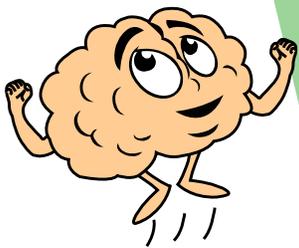
Answer: The third statement is the beginning of the Habit Hub override because gambling is now a habit. As the person keeps gambling habitually, gambling becomes less fun but there are still strong urges to keep going. By statement 5, the Habit Hub is in control.

GOING FURTHER:

Can you relate to wanting to gamble even if you don't like gambling anymore? Based on what you learned here, what can you tell yourself in order to get through an urge to gamble?

Why is it helpful to avoid gambling cues (e.g., seeing a gambling ad on TV) early on in treatment?

What good habits would you like to develop in your life?



TAKE HOME MESSAGE: As a person develops an addiction problem, there may be a shift in brain activity from the 'Reward Hub' to the 'Habit Hub' and a shift from 'liking' to 'wanting'. A person may want to gamble and not even like it anymore. The brain is also overly aware of the gambling cues which can trigger powerful urges to gamble. But gambling won't feel as fun as it used to because gambling is now a habit and habits don't give us the same pleasure as new experiences. Instead, gambling might have become a way to ease the discomfort of strong urges. **The good news is that our brain learns quickly, so over time we can form new associations to help develop healthy behaviours that we find pleasurable.**



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