Sex, drugs and … vocabulary? Hedonism not only thing that rewards the brain!

A recent study indicates that for some people, learning new words–such as in Scrabble games–activated the same machinery in the brain as sex, drugs, and possibly fatty and sugary foods. Indulging in these activities feels pleasurable because they activate reward circuits in our brain, especially those mediated by the neurotransmitter dopamine. This might help explain how humanity acquired language in the first place.

Dopamine's effect is fleeting: once it dissipates, we want to recapture the feeling it gave us. This reward seeking can motivate many human behaviors, and like many such motivators, its power can be used for good or for ill.

The search for another hit of dopamine manifests in drug and gambling addicts. Unfortunately, due to a combination of genetic predisposition and their behavior, these people have malfunctioning dopamine reward circuits. They probably start out less sensitive to dopamine's effects than others, and the risky behaviors they therefore pursue deaden their responsiveness to it even further. They must constantly seek more and more stimulation to feel the same "high" from their brain.

The same reward-seeking impulse that goes awry in addicts may, in light of the latest evidence, be part of what spurred early humans to begin developing the huge vocabularies we use today to communicate with each other. Many other species, especially social primates, use sophisticated communication – but human language represents an enormous leap in the evolution of humankind and our societies. Our seemingly limitless capacity to develop and learn new words allows us to share our observations and ideas, whether we're leveraging it to win a board game or to explain relativity. Despite its obvious importance, how and why language evolved in early humans has been a mystery.

Pablo Ripollés, a PhD student who conducted this language study, noted that "Those with higher myelin concentrations – or a better connection to the reward area –were able to learn more words." This jibes with a theory of human evolution that is currently in vogue: it is not the types of neurons or neurotransmitters that we have that distinguish our brains from those of apes and other primates – they have all the same stuff we do. The cells and regions of our brains are just more interconnected than theirs. And this interconnectivity is another essential element of our proclivity for language.

According to Chet Sherwood, a biological anthropologist at George Washington University who studies how the human brain is unique and how it came to be so:

> What has been most significantly changed in human brain evolution hasn't been the distribution of different cell types or even necessarily the expression of neurotransmitters but rather the long-range connectivity … human brains have more promiscuous connectivity along pathways that are also present in our close relatives. These pathways in humans reach out and connect more widespread areas.

Combine the heady dopamine reward for learning a new word and the brain's heavily interconnected architecture and you have a recipe for the development of a complex language with an ever-growing lexicon. According to Ripollés and his new work, the people who most loved learning new words were those whose reward region was most tightly linked to their language areas. For these highly connected types, expanding their vocabulary is just a huge turn on; it feels so good they can't resist. Fortunately for contemporary wordsmiths, the same may have held true for some early humans, spurring them to develop the languages we have to play with today.

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Additional Resources:

- Gambling behavior linked to dopamine regulation genes, Genetic Literacy Project
- Rethinking addiction and the brain on drugs, Genetic Literacy Project
- Genetics of being a daredevil, Genetic Literacy Project