MIND & BRAIN

Getting Hooked on Sin

A neuroanthropologist explains what Colombian teenagers can teach neuroscientists about addiction

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Daniel Lende is a neuroanthropologist at the University of Notre Dame. He and Jonah Lehrer, the editor of Mind Matters*, discuss what this new field can teach us about craving, capoeira and the link between the brain and culture.*

LEHRER: You're a neuroanthropologist. What's that?

LENDE: Someone who thinks that both brains and culture make us who we are, so good research needs to create bridges between anthropology and neuroscience.

The problem is that most modern science is still full of dichotomies. Culture versus biology is one of the biggest. I see it as the new nature-nurture debate. Our genes and our brains make us who we are. No, it's language and history. The argument often degenerates from there.

How can we escape such useless dichotomies? As a neuroanthropologist, I have found it important to focus on concrete problems where we can build interdisciplinary understanding step-by-step. Anthropologists are generally trained to focus on practices, meaning, embodiment, inequality, social contexts and relationships. The trick is figuring out how these categories match up with new discoveries in the brain sciences.

LEHRER: One of those concrete problems that you've studied is craving. What can neuroanthropology teach us about craving and its most extreme form, addiction?

LENDE: Let's begin with the neuroscience. In the scientific literature on addiction, dopamine has often been made out as the "bad boy" behind substance abuse. Although dopamine is often associated with the experience of pleasure—it represents "rewards," such as chocolate cake or crack cocaine—it also helps make us want stuff. Wanting just needs a little push to get to craving.

There is one small problem: much of the dopamine research is done through lab work with rats and monkeys. As I tell my students, that is not the same as getting a late night pizza craving and picking up the phone to dial Dominos.

But I did see in my work with Colombian adolescents that research on incentive motivation and dopamine could help me understand how some adolescents got so deeply involved with drug use.

So I asked myself: How could I put this genuine advance in neuroscience into practice to actually understand people? As with almost all neuroscience research, the results are exciting, but they suffer from a serious translation problem.

This predicament is where neuroanthropology can be so helpful. In order to draw connections between neuroscience and real world situations, I went out and talked to people to understand craving and addiction from their point of view. This type of real-world data can both challenge and inform ideas based on animal models and neuroimaging studies.

In translating the dopamine research, my work with adolescents proved crucial. They knew what they experienced far better than I did. Using systematic interviews across a range of involvement with drugs (hard-core users to having never tried drugs), I saw three areas of overlap between research on dopamine and compulsive involvement with addictive substances.

First was the emphasis that researchers placed on "wanting." I was lucky in Colombia; addicted adolescents often described their experiences as "querer más y más," to want more and more. Second, dopamine affects shifts in attention, which meant that some adolescents couldn't focus on anything else when they knew an opportunity to consume was about to come along. Third, adolescents described a sense of being pushed toward something—an urge that rose up without conscious desire.

I created an eight-item scale based on this ethnographic research. High endorsements of wanting, attention and urge were some of the best predictors of being addicted in my sample. The items in the scale also held together well, providing more evidence that linking brain function with actual experience represented a valid way to examine this problem. Most scales that focus on craving or desire give us an outside view of the phenomenon; for example, they mark on a zero-to-100 scale how much craving an individual is experiencing at that moment. My scale, available at the Neuroanthropology blog in both Spanish and English, gives us a view from the inside looking out.

LEHRER: How should this change the way we think about addiction or craving?

LENDE: I'll answer that by telling you about Giovanni, one of my oldest informants whom I talked to extensively about craving and addiction. Giovanni was out of treatment at this point, struggling to get ahead. That night he was out of money, and he tried to bum a free ride off the bus driver. Now this bus driver remembered what Giovanni had once been—a very successful thief. He told Giovanni, steal me a watch and you can ride my bus all you want.

In that moment, Giovanni remembered the easy money from before, and how that meant easy drugs. He remembered the fame he had on the street, so different from what he was now facing working dead-end jobs. And he felt a surge in craving to go use. That night Giovanni was able to walk away, but he did relapse soon thereafter.

That was the story Giovanni told me when he was coming out of that relapse. Although the dopamine research represents one way to describe what was happening inside parts of his brain as he felt that surge of craving, that description misses out on a range of other causes: Giovanni's interaction with a bus driver, the tough situation he faced at that point in time, his desire for a past life linked to drugs. This combination—linking brain function to context, meaning and relationships—is an extremely exciting step forward in building scientific explanations that get at more than one "why," or look at reality through a prism that isn't an oversimplified dichotomy, such as nature-nurture or brain-culture. That is what neuroanthropology is about. Not a disease model of addiction or a moral model of addiction. A people model of addiction.

LEHRER: What are some of the other issues neuroanthropology can teach us about?

LENDE: Sports is a great example. Greg Downey, who co-founded the blog neuroanthropology.net with me, has done research on how different athletes learn balance. Having balance in a particular sport is a highly skilled activity, relying on hours and hours of practice. But there is no doubt that balance is also mediated through the brain. With his work on capoeira, a Brazilian martial art, he found that instructors taught in ways that matched well with work on neuroplasticity in the brain, for example, through the reorientation of perception as well as imitative learning and mirror neurons.

Memory is another area. Our neurological understanding of memory has advanced by leaps and bounds over the past several decades. At the same time, anthropologists and other social scientists have become increasingly interested in various forms of social memory. We can put those areas of research together. For example, Cameron Hay will give a paper on memory and ritual healing at the Encultured Brain session Greg and I have put together for the annual American Anthropological Association conference on November 20 in San Francisco.

There is a new generation of young scholars using neuroanthropology to examine stress, social cooperation, PTSD [post traumatic stress disorder] and more. These real problems already bridge the dichotomies in the science. We want our research to do the same.

Are you a scientist? Have you recently read a peer-reviewed paper that you want to write about? Then contact Mind Matters editor Jonah Lehrer, the science writer behind the blog The Frontal Cortex *and the book* Proust Was a Neuroscientist.