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By [Randy Dotinga](#)   Also by this reporter

02:00 AM Aug, 23, 2006

As a rock producer, Daniel Levitin worked with Stevie Wonder, the Grateful Dead and Chris Isaak. But the music business began to change, and a disillusioned Levitin turned to academia, where a career in neuroscience beckoned.

Sixteen years after he made the switch, [Levitin](#) is an associate professor at McGill University in Montreal and one of the world's leading experts in cognitive music perception.

In his new book, *[This Is Your Brain on Music: The Science of a Human Obsession](#)*, Levitin explores research into how our brains process the works of artists as varied as Beethoven, the Beatles and Britney Spears, and why they make us feel so good. Wired News picks his brain about how it all works.

Wired News: Are there any myths about music that neuroscientists have exposed?

Daniel Levitin: I think we've debunked the myth of talent. It doesn't appear that there's anything like a music gene or center in the brain that Stevie Wonder has that nobody else has.

There's no evidence that (talented people) have a different brain structure or different wiring than the rest of us initially, although we do know that becoming an expert in anything -- like chess or race-car driving or journalism -- does change the brain and creates circuitry that's more efficient at doing what you're an expert at.

What there might be is a genetic or neural predisposition toward things like patience and eye-hand coordination. (On the other hand), you can be born with a physiology that gives you a pleasant-sounding voice, but that doesn't guarantee you'll have a career as a singer.

WN: What does music tell us about the brain?

Levitin: Through studies of music and the brain, we've learned to map out specific areas involved in emotion, timing and perception -- and production of sequences. They've told us how the brain deals with patterns and how it completes them when there's misinformation.

What we're learning about the part in the frontal lobe called [BA47](#) is the most exciting. Music suggests that it's a region that helps us predict what comes next in a sequence.

WN: What have we learned about music perception from people with brain disorders or injuries?

Levitin: We've learned that musical ability is actually not one ability but a set of abilities, a dozen or more. Through brain damage, you can lose one component and not necessarily lose the others. You can lose rhythm and retain pitch, for example, that kind of thing. We see equivalents in the visual domain: People lose color perception or shape perception.

I think of the brain as a computational device: It has a bunch of little components that perform calculations on some small aspect of the problem, and another part of the brain has to stitch it all together, like a tapestry or a quilt.

WN: You write that you're more interested in the mind than the brain. What's the difference?

Levitin: The brain is a bunch of neurons, chemicals, water and blood.... The mind is the thoughts that arise from the brain. Anatomists and neuroanatomists are particularly interested in understanding how the brain is formed and how cells communicate. They're really looking at the architecture and geography of the brain....

What we're trying to do is figure out (which) parts of the brain do what and how they communicate with each other. But not simply on a level of description that discusses only neurons and cells, but one that also talks about real ideas, thoughts and memories.

WN: From an evolutionary perspective, why have humans developed music?

Levitin: There are a number of different theories. One theory is that music is an evolutionary accident, piggybacking on language: We exploited language to create music just for our own pleasure. A competing view, one that Darwin held, is that music was selected by evolution because it signals certain kinds of intellectual, physical and sexual fitness to a potential mate.

WN: How does that play out in rock 'n' roll, for example?

Levitin: (Research has shown that) if women could choose who they'd like to be impregnated by, they'd choose a rock star. There's something about the rock star's genes that is signaling creativity, flexibility of thinking, flexibility of mind and body, an ability to express and process emotions -- not to mention that (musical talent) signals that if you can waste your time on something that has no immediate impact on food-gathering and shelter, you've got your food-gathering and shelter taken care of.

WN: Do any animals show an appreciation for music?

Levitin: There's no evidence they do -- that birdsong is used in the same way we (use it, for instance, or) that animals use it for recreation. And some of the fundamental things we take for granted about music don't exist in the animal kingdom.

WN: What are we learning about the link between music and emotion in the brain?

Levitin: Music activates the same parts of the brain and causes the same neurochemical cocktail as a lot of other pleasurable activities like orgasms or eating chocolate -- or if you're a gambler winning a bet or using drugs if you're a drug user. [Serotonin](#) and [dopamine](#) are both involved.

WN: Could music be an antidepressant?

Levitin: It is already -- most people in Western society use music to regulate moods, whether it's playing something peppy in the morning or something soothing at the end of a hard day, or something that will motivate them to exercise. Joni Mitchell told me that someone once said before there was Prozac, there was her.

WN: What is an [earworm](#), and what doctor do I see if I get one?

Levitin: It's the name the Germans give to these songs that get stuck in your head that you can't get rid of. If they're really bothersome, you can do what Neil Young told me: Become a professional songwriter. He writes songs to get them out of his head.

Failing that, the second thing you can do is go to a doctor and have them prescribe an antidepressant or anti-anxiety drug like Prozac or Ativan. Or the most common option, find an equally annoying song that's not bothering you right now, and it will replace the earworm with another one.

Rants & Raves

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