THE MUSIC OF MY MIND: A NEUROSCIENTIST EXAMINES THE RECIPE FOR LISTENING ECSTASY

I have to admit a bias—I like brains, almost as much as I like blistering guitar solos or throat-shredding vocals. Most people don’t realize that music wouldn’t exist without this three-pound mass of cells and water. I’m not just talking about the brains required to compose a song, or to control the precision finger movements of a virtuoso guitarist— I’m talking about listeners’ brains.
Musicians exploit facts about the way our ears, and then brains, perceive music in order to create some of the most surprising, rewarding and pleasurable effects of listening to music. They do this in a variety of ways, often intuitively, without even knowing the mental principles involved. Here’s a list of some actions that lead to convergences between music and neuropsychology:

1) VIOLATE EXPECTATIONS: PITCH We’re used to melodies being composed of different notes. But in “Something” by The Beatles, the melody plays the same note—the tonic—for the song’s first six notes. When Harrison finally comes off the tonic, he hits the least likely note in the scale, the leading tone. He has masterfully violated our expectations that melodies need to move from one note to another and, further, that they need to move from a leading tone to a tonic. McCartney holds a single pitch for the first seven notes of “You Never Give Me Your Money” and the first six notes of “For No One.” Antonio Carlos Jobim’s “One Note Samba” takes this to an extreme.

2) VIOLATE EXPECTATIONS: RHYTHM A lifetime of musical experience has taught us that music contains steady beats, and that when the beat stops, the music’s over.

3) VARIATIONS ON A THEME Our brains have evolved to love variety—in food, sex and music. A classic trick is when musicians restate a musical idea on a different instrument. The guitar solo in “And I Love Her” by The Beatles—which plays the same melody as the vocal—does just this, as does the solo in Coldplay’s “Don’t Panic.”

4) PARADOX AND CONTRADICTION Another form of variation involves contradiction. Musicians often surprise us by playing songs we wouldn’t expect them to, or in a style we wouldn’t expect. When Van Halen was the newest, hippest group around it surprised fans by launching into a hard-rock version of an older not-quite-hit-at-the-time song by The Kinks, “You Really Got Me.” Unapologetically unsentimental rockers The Rolling Stones had done the opposite a few years earlier by using violins on “Lady Jane.” Tori Amos recorded a soft-ballad version of Nirvana’s abrasive classic “Smells Like Teen Spirit.” The inherent juxtaposition of styles is musically (and neurally) rewarding.

5) JUTXPAPOSE EXPECTATIONS: RHYTHM AND GENRE The Police made a career out of violating rhythmic expectations. Rock’s standard rhythmic convention is to have a guitar or piano play downbeats (ones and threes) while a snare drum plays backbeats on the two and the four. Reggae turns this around, putting guitar on two and four with the backbeat. The Police combined reggae with rock to create a new sound that simultaneously fulfilled some—and violated other—rhythmic expectations. Sting often played bass parts that were entirely novel, avoiding the rock clichés of playing on the downbeat or of playing synchronously with the bass drum. “Spirits in the Material World” from Ghost in the Machine takes this rhythmic play to such an extreme that it can be hard to tell where the downbeat even is.

6) VIOLATE STRUCTURAL EXPECTATIONS In “Yesterday,” the main melodic phrase is seven measures long. The Beatles surprise us by violating one of the most basic assumptions of popular music: the four-or-eight-measure phrase (nearly all rock/pop songs have musical ideas organized into phrases of those lengths). We’ve heard thousands of songs thousands of times and, even without being able to explicitly describe it, we’ve incorporated this tendency as a “rule” about music we know. So when “Yesterday’s” seven-measure phrase comes along, it’s a surprise. Even though we’ve heard the song 1,000 or even 10,000 times, it still interests us because it violates schematic expectations that are even more firmly entrenched than our memory of this particular song.

7) DON’T DO THE SAME THING TWICE Master musicians add subtle shadings of nuance and difference to their parts; each time they play a part, they change it a bit. In Stevie Wonder’s “Superstition,” for example, the beat on the hi-hat is never played exactly the same way twice. The genius of Wonder’s playing is that he keeps us on our mental toes by changing the pattern’s aspects every time, making just enough of it the same to keep us grounded and oriented.

8) UNFOLD CHORDS ONE NOTE AT A TIME Instead of playing the guitar chords all at once, composers will often spoon-feed them to us one note at a time. This builds tension and exercises our brains by forcing them to assemble the notes into a coherent harmonic object. We become participants in the music’s creation by creating in our heads the chords the guitarist implies. This is one of the oldest tricks there is, found in Beethoven’s sonatas, The Beatles’ “Because” (based on Beethoven’s “Pathétique” sonata), The Cure’s “Kyo Song,” Death Cab For Cutie’s “Technicolor Girls” and countless others.

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APPALACHIA MEETS THE HIMALAYAS
Folk-grasser Abigail Washburn will take her mountain music to new heights in October when she takes part in the first official U.S. cultural mission to Tibet. Accompanying Washburn will be The Sparrow Quartet, featuring acclaimed banjo man Béla Fleck, her longtime cellist Ben Sollee and fiddler Casey Driessen. Washburn, who’s already visited China and recorded two songs in Mandarin, learned a new pair of Chinese folk tunes for this trip and anticipates collaborating with local musicians.

“I’m a dreamer and an idealist, and I really want the world to be a better place,” she tells Paste. “We need the voice of culture. We need it to be as loud as possible.” Michael Berick