



Q&A Vijay Iyer

Jazz experimentalist

*Vijay Iyer is a New York jazz pianist who has academic roots in physics and music cognition. As he releases *Accelerando* — a follow-up to his 2009 world number one jazz album *Historicity* — he talks about the bodily origins of rhythm, the science of improvisation and the social function of music.*

How did you start out?

My father, a pharmaceutical chemist, was in the first wave of Indian immigrants to the United States. I was raised to value science, and I had a few piano lessons as a teenager. At Yale University in New Haven, Connecticut, where I studied physics and mathematics, I played music the whole time, but never considered it as a career. Then, as soon as I arrived at the University of California, Berkeley, to do a PhD in physics, I won a jazz-piano competition. I was pursuing research in solid-state physics, modelling defects in magnetic materials, but music was turning into a part-time job. Finally it took over.

How did you begin to study music perception?

At 24, I hit a wall with research and started taking courses outside physics. One was with David Wessel at Berkeley, who did important early research on timbre perception and computer music. I was ready to become an artist, but he helped me to create my own PhD programme in music perception and

Accelerando

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cognition. I began to see that the field can be dangerously monocultural. Most test subjects in the psychology literature are wealthy undergraduates at liberal-arts institutions. It is very hard to tease out the cognitive universals of music from a sample of white, suburban teenagers listening to Mozart.

What was your dissertation about?

I described cognition as intimately tied to the senses, situated and embodied in the body's many timescales. The breath has a flexible period of several seconds that corresponds to the lengths of typical musical phrases. The heartbeat and footsteps occur once or twice a second, close to the natural pulse of most music, and speech rhythms correspond pretty well to finger motions and to rapid rhythmic detail.

Why focus on rhythm?

At the primal level, music is rhythm first, the sound of bodies in synchronous action.

That is why there is a pulse in music. Rhythm perception is an imagined movement in the motor centres of the brain. Our skill for coordinating our actions is the real foundation of music, and possibly of civilization.

What kind of music research would you like to see?

I would like to see researchers collaborating with musicians, which doesn't happen much. Charles Limb, a surgeon at Johns Hopkins University in Baltimore, Maryland, does brain scans of people improvising on a piano. He has also taken scans of rappers freestyling. His findings — that improvisers turn down the part of the brain that governs inhibitions and turn up the part that governs creativity — are specific and plausible.

How do your research and music feed one another?

For a while, I tried to keep up with research conferences. But making music is its own kind of research. The musicians that I like are experimenting constantly, testing ideas with an audience night after night, and trying to push the boundaries of what they know.

How do you use scientific ideas in your music?

Some composers might write a string quartet 'about' string theory, but that is just inspiration, it is not really discovery. I'm more of an experimentalist. There is an auditory illusion of a constantly ascending pitch, known as Shepard tones: the musical equivalent of M. C. Escher's infinite staircase. As the pitch goes up, the distribution of harmonics shifts down, and your ear can't find the place where it doubles back on itself. I used this illusion in a string quartet by asking the players to perform a synchronized glissando in parallel octaves and imposing a bell curve on their amplitudes. It worked. After that, I asked, can we do this with tempo? At the end of the title track on *Historicity*, there is a rhythm that constantly decelerates. On *Accelerando*, there is a piece giving the illusion of constant acceleration, of a tempo that flexes.

What is the future of music?

People walk around with headphones on, thinking of music as a solitary, personalized pursuit. But it has connected us by synchronizing our actions throughout human history. Because we are so engrossed in the technical aspects, it is easy for scientists, and even for musicians, to forget that the effects of music are primarily emotional. That is why people keep it in their lives. ■

INTERVIEW BY JASCHA HOFFMAN