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Beat Science

Musicologist William E. Smith dissects hip-hop syllable by syllable.

By Sarah Godfrey

For a good part of 2001, William E. Smith was holed up in a back room in his parent's Pennsylvania home, listening to the first verse of Run-DMC's "Sucker MCs" over and over again—and despairing. With the help of a computer and some music-arranging software, he was trying to break the track down to its most basic elements, hoping that they could help him draw larger conclusions about hip-hop as an art form.

"I analyzed it measure by measure, counting syllables, notes, importing it into a chart, comparing charts," Smith says. "I was sitting there for hours. What does this mean? I don't know. What does this mean? When you're in the middle of it, you don't know."

But little by little, Smith began to make sense of his raw data. He decided that Run's style has "swing" because the MC emphasizes certain beats like a jazz drummer—specifically, by consistently placing rhyming words on every fourth quarter note. He deduced, too, that Big Daddy Kane's flow is dependent on placing rhyming words within lines rather than at their ends. Eventually, Smith says, "It all became better."

The findings from that frustrating but fruitful exercise are documented in Smith's new book, *Hip Hop as Performance and Ritual: Biography and Ethnography in Underground Hip Hop*. The text, adapted from the 33-year-old American University assistant professor's doctoral dissertation, compares the MC to the African griot and the Yoruba deity Eshu; traces hip-hop's lineage and its ties to blues, jazz, and Latin music; and characterizes the genre's live shows as an important cultural ritual.

But toward the back, all that ivory-tower theorizing gives way to the kind of bar-graphed figures that are a little harder to argue with. Both "Sucker MCs" and Kane's "RAW" get charts tracking their syllables per measure, the number of beats between rhymed syllables, and the average number of syllables per lyrical line. Ditto for Busta Rhymes' "Put Your Hands Where My Eyes Can See" and "Step Into My Life," a song by District-based MC Priest Da Nomad, who figures prominently in the book.

"It's another way to research hip-hop as a musical invention," Smith says. "People look at the lyrics, the social impact of hip-hop, its musicality, complexity—this is a scientific approach." What has science revealed? That the average number of syllables per hip-hop measure has been increasing over the years, while the



Professor Glyph:Smith pictures the progress of old-school hip-hop. (Photo by Darrow Montgomery)

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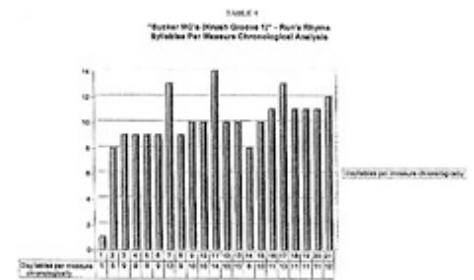
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average number of measures per hip-hop song has been decreasing. Whereas 1983's "Sucker MCs" contains an average of 9.75 syllables in each of its 21 measures, 1997's "Put Your Hands" averages only 12.82 syllables per measure for four fewer measures.

The contemporary rapper, Smith writes, is "trying to say more in a smaller amount of time"—just one indication, he argues, that hip-hop "has grown from the Run-DMC days to the underground hip-hop we have now. It grew not only in lyrics, metaphors, and analogies, but also in terms of rhythm and musicality. And then the technique—forming the words and forming the mouth to say so many words."

Most rap fans would probably agree with that conclusion—though, Smith suggests, they wouldn't necessarily embrace the methodology. "People think that you lose awe and wonder for something knowing how it was created," he says. "I disagree. I think you can appreciate it even more."

While going to New York's Fiorello H. LaGuardia High School of Music & Art and Performing Arts, Smith was an MC in a rap group called the Vigilantes of Hip-Hop. As he grew older—and more skilled at his instrument of choice, the saxophone—he shifted his focus from rap to jazz. But he remained interested in what he sees as similarities between the two types of music.



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"Once I really started learning jazz, I realized that the same thought process I was using to create in jazz, I was using to create in hip-hop—specifically in freestyle," says Smith, who's fronted his own jazz ensemble, the W.E.S. Group, for 12 years. "That was like a superfascination for me....It was inevitable I was going to do something on it researchwise."

In 1995, when Smith was beginning his doctoral studies at the University of Maryland, College Park, current United States Ambassador of Hip-Hop Toni Blackman was starting the D.C. rhyme collective Freestyle Union. Smith began attending the group's ciphers and was struck by the talent of Freestyle members such as Storm the Unpredictable, Sub-Z, Kokayi, and, especially, Larry Ware, better known as Priest Da Nomad.

"He had this dominating size—he was taller than everybody, all up in front of the crowd, getting everybody hyped," says Smith. "We started really making a connection, and I started focusing on him."

About a year after they met, Priest says, Smith approached him about being a part of his work. "He said, 'Do you mind if I use you as the basis of my dissertation? My thesis involves the connection of the MC to African griots and the evolution of the MC as a storyteller, and the way you do your thing is so picturesque, so vivid, I really wanna use you as a holographic model,'" Priest, 33, recalls. "At the time, I didn't know what that involved. I was like 'Aight—whatever.'"

Smith followed Priest around for the next seven years—even keeping up with him when he temporarily moved to Atlanta in 1999. He had the rapper assist him in defending his dissertation by freestyling in front of the committee. And when Smith was hitting his head against an analytical wall in his parents' house, it was Priest who helped him reach a breakthrough.

"I went to Priest and I said, 'It looks like you're not following any metric thing.' He said, 'Exactly. That's the whole point. The words are what's important,'" Smith recalls. "So I put that in there: 'Words im-por-tant.'"

In *Hip Hop as Performance and Ritual*, Smith positions Priest as a mold-breaking MC. He delves into the rapper's background, his place in the D.C. hip-hop scene, and his status on the national scene. But the most flattering portrait lies in all of those figures in the back of the book: Smith found that, of all the rappers he listened to for his project, Priest is the only one to rhyme a majority of his syllables on the final 16th note of a measure, rather than on the 12th or the 13th.

"Priest didn't respect the bar line," Smith says. "It's like, 'Forget the bar line—I'm gonna rhyme this phrase on whatever beat I feel like.' It's gonna come out; it's gonna rhyme. But the rhythm is gonna blow apart the whole metric-verse thing—that's what those charts show. There were guys breaking through that verse thing, but it's the level of complexity Priest was using. It's just free—just floating everywhere."

Although he jokes that he's not the "complex creature" the book depicts, Priest does acknowledge that Smith has revealed something essential about his music. "I don't think of [my work] in that way, but I do think about my flow when I approach writing music," he says. "I deal with my cadence before the words—spit a mush rhyme over the beat to figure out how I can attack it, if I can triple it up, spill over, or lay back behind the beat."

Attacking the beat is the challenge for every MC, of course. But Priest says that no up-and-comer should consider using *Hip Hop as Performance and Ritual* as a how-to guide. "Hip-hop is about what's new and fresh—always," he says. "If you say, 'This was done like that, I'm gonna study it'—well, we moved on from that five months ago. Or two years ago."

One of the bookcases in Smith's Brookland apartment holds a copy of 1982's *Charlie Parker Omni Book*, the first collection of sheet music to transcribe the work of the jazz great so that anyone could appreciate—or duplicate—his style. "This made it possible for everyone to do what Bird was doing," Smith says. "It gives the chords—everything....Before, if someone wanted to copy something he was doing, they had to sit down and figure it out bit by bit."

Of course, seeing Parker's work on paper is nothing like actually hearing it—which is nothing like actually hearing it played by Parker. Which is nothing like hearing it played by Parker with the right sidemen. So efforts such as *Hip Hop as Performance and Ritual*, which Smith self-published late last year, and the Music Genome Project, which launched at Pandora.com in an effort to create "the most comprehensive analysis of music ever," might actually be more useful for telling us about ourselves than for telling us about what we listen to.

Daniel Levitin, a McGill University associate psychology professor and author of the upcoming *This Is Your Brain on Music: Revealing the Secrets of a Uniquely Human Obsession*, says that our ability to appreciate music co-evolved with our brain. "The most primitive parts of the brain—parts we have in common with all other vertebrates—are responsive to beat," he says. "It's the relatively newer parts of the brain...that are more sensitive to pitch, harmony. We have a primordial urge for synchronization with beat. That's why I think we're drawn to electronica, trance, as well as hip-hop."

Levitin's own research on musical preferences suggests that one could indeed show a predilection for Priest over Kane because of those final-16th-note drops. "The lyrical content has some effect," Levitin says. "But the lyrics are carried by the music....And we are born with a body that imposes some constraints there, too.

"Just like somebody 7 feet tall isn't likely to become a jockey, and someone 4-foot-2 isn't likely to become an

NBA player, the physical ear—the shape of ear canal, the size of body—influences the way in which ears resonate, has an influence on what things sound like. For a variety of reasons, one can be drawn toward mandolins or accordions or tom-toms—some of that might be physiological; some might be neurological.”

Although Smith has toyed with the idea of building on his analysis, he’s been too busy to do so in the months since the book came out. He’s currently teaching a full course load at AU, working on another book, preparing the next release by the W.E.S. Group, and even attempting to start an association of hip-hop educators. But part of him is also content to leave some things unexamined.

“Your analysis can’t get to all the...nuances,” he says. “It can’t encapsulate the whole thing. It can give a brief description, but it can’t describe the emotion felt. It can’t describe what the experience was—it can describe about the experience.”

In other words: Awe and wonder are safe from charts and graphs. “Religious people will go against science,” Smith says. “They say it doesn’t account for God. My answer to that is, no, it just shows you how amazing and powerful that spirit is.” **CP**

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