10 Jazz Rhythm

The Challenge of "Swing"

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When we think about the musical features most characteristic of jazz, those that particularize its style and distinguish it from other kinds of music, we almost always think of rhythm first. There are other important features, to be sure – the centrality of improvisation, for example, or the blues foundation of jazz melodic practice. But rhythm has typically been the feature addressed first in most writings on jazz since its origins early in the twentieth century, pride of place signaling its significance to jazz fans, critics, and historians.

The word most centrally associated with the rhythmic component of jazz, of course, is *swing*. The term has a few interrelated meanings today. It is used rather superficially to designate a particular way of articulating eighth notes (understood in contrast to "straight" eighth notes), or to refer to the underlying "groove" of what has come to be called "straight-ahead" or "mainstream" jazz.[1] More substantively, however, *swing* refers to a mysterious but fundamental rhythmic quality historically thought to be the essence of true jazz; absent swing – irrespective of eighth-note articulation or the syntactical features of the rhythm section's groove – one presumably does not have jazz.[2]

And yet, characterizing this rhythmic quality, let alone explaining it, has proven to be extremely difficult, if not impossible. Definitions have varied widely, as have the connotations it carries. Prior to its use with jazz, the term referred to a lively, danceable rhythmic cadence in virtually any kind of music, as well as poetry. It came to be associated exclusively with jazz only in the 1930s, when it acquired an implicit racial meaning that it has never fully shaken.[3] Since then, scholars have taken a variety of approaches to defining swing and explaining its effects. Some have understood swing as the product of timing relationships between the instruments in a jazz ensemble, especially the rhythm section. Others have investigated the "swing ratio," seeking to better differentiate the timing profiles of individual artists or to generalize across instruments or historical periods. Ample data have been gathered, and yet we seem to be no closer to understanding the nature of swing than we were during the Swing Era itself.

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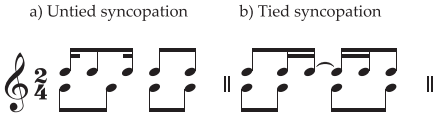
Why is swing so difficult to explain? It was intractable by design, a means of establishing a foundational and indisputable criterion of value for jazz as a whole, but also serving as a measuring stick by which to distinguish true jazz from false, good from bad. It emerged in the 1930s as *the* term to describe jazz rhythm, designating a rhythmic quality belonging to no other music, recognizable to those in the know and quantifiable in the sense of less or more, but otherwise, indefinable. As such, it answered a need in jazz criticism of that time as a defense against those who had claimed that jazz offered nothing new, nothing unique, to music.

Prior to the 1930s, discussion of rhythm in jazz differed little from that of its predecessor, ragtime – hardly surprising, since jazz was built on the rhythmic foundation of ragtime. Commentary on both tended to focus on two principal features: (1) the relentlessly steady pulse of the music (what Richard Waterman later famously described as the "metronome sense"), and (2) the extensive use of syncopation.[4] These were indeed the most salient rhythmic characteristics of both ragtime and early jazz, but there was nothing particularly distinctive or original about either one: most kinds of dance music required a fairly metronomic pulse, and syncopation was certainly not unique to jazz or other forms of African American music. Critics of ragtime and jazz frequently seized upon these facts as evidence of the music's lack of artistic merit. The reliance on syncopation was purportedly due to a lack of imagination, and thus the music was about rhythmic excess, not the exercise of good taste, as the anonymous author of an 1899 essay published in *The Étude* makes clear:

> Ragtime music has a respectable old genesis; an old, venerable one indeed. We need not go farther back than to the music of the god-like Beethoven to find examples of ragtime music; though formerly known under a more respectable technical name, that of syncopation. So ragtime music is simply syncopated rhythm maddened into a desperate iterativeness; a rhythm overdone, to please the present public music taste.[5]

David Stanley Smith, Dean of the Yale School of Music, said much the same thing about jazz in 1924:

> What is bound eventually to deaden the inventiveness of the "great American composer" is the fact that jazz is the exploitation of just one rhythm. This rhythm is the original rag-time of thirty years ago. There have been occasional captivating additions to it in the form of elaborate counterpoints in jarring rhythmic dissonance, but the fundamental "um-paugh, um-paugh" and the characteristic syncopation persist through the years. Without these there is no jazz.[6]



10.1 Conventional ragtime syncopations

Contrary to such criticisms, ragtime historian Edward A. Berlin finds it significant that "these rhythms were used with sufficient consistency to define the ragtime idiom, and that the intent of such rhythms, an intent made abundantly clear from the sheet-music covers and titles, was to reproduce the character of 'quaint' black music."[7] To that end, ragtime composers made extensive use of two specific varieties of syncopation thought to typify black rhythm, which Berlin refers to as "untied" and "tied," illustrated in Example 10.1.[8]

Untied syncopations remain within the separate halves of a measure, and are thus minimally disruptive to the perception of metric regularity. Whatever destabilization of the meter emerges on the weak second eighth-note beat is quickly dispelled through a return to metric congruence on the strong third beat, further confirmed on the fourth. Tied syncopations, by contrast, offer greater potential for disrupting perception of metric regularity over a greater span of time. Here, it is the strong third beat that is destabilized with syncopation; metric congruence returns on the weak fourth beat, and thus the ensuing downbeat is required for further stabilization.

Drawing data from a sample of 1,035 piano rags published between 1897 and 1920, Berlin found that untied syncopations were considerably more common than tied syncopations through about 1900. As the decade wore on, however, tied syncopations came to predominate. In 1900, the ratio of untied-to-tied-syncopation rags in Berlin's sample was 3:1. By 1902, it had flipped to 1:3, and then dropped to 1:7 by 1905 and 1:20 in 1908.[9] The untied syncopation figure was a relic of blackface minstrelsy, a rhythmic convention found in innumerable late nineteenth-century character pieces referencing antebellum black folk dances. The decline of its frequency correlates to the disappearance of "the more flagrantly abusive form of coon song" and a "deracialization" of ragtime song by 1906.[10]

Meanwhile, as the frequency of tied syncopations grew, they came increasingly to be used at the tail end of the "secondary rag" figure, another common feature in early ragtime first identified by Don Knowlton in 1926.[11] Essentially a 3×2 polyrhythm, the secondary rag generates what Harald Krebs describes as a grouping dissonance.[12] The opening measures

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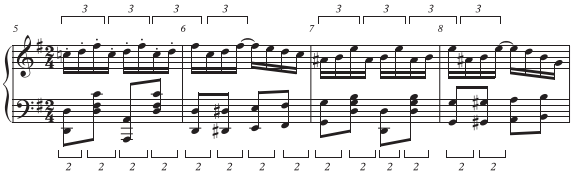

10.2 Botsford, *Black and White Rag*, mm. 5–8

of the A strain of George Botsford's *Black and White Rag*, shown in Example 10.2, provide a typical example.[13] In mm. 5–6, a 3-line (1=16th) is superimposed over a 2-line through four iterations over dominant harmony, at which time the pattern breaks with a tied syncopation. This pattern is repeated over tonic harmony in mm. 7–8.

Berlin also reports the growing use of dotted rhythms in the published rag repertory of the 1910s. In the first decade of the century, dotted rhythms appeared in less than 6 percent of published rags. This figure would grow to 12 percent in 1911, 23 percent in 1912, 46 percent in 1913, and 58 percent in 1916. Meanwhile, syncopation remained common in the ragtime repertory throughout this decade, but it was seldom used in dotted-rhythm passages.[14]

This increase in the use of dotted rhythms suggests an effort by ragtime composers to reflect in music notation the performance practices of itinerant black piano players like Jelly Roll Morton. By this time, these musicians were likely making use of what would later be termed "swing eighth notes," a practice hinted at a decade earlier in some of the few extent banjo recordings of rag tunes made in the early 1900s.[15] Dotted notation is simply an early effort to capture in writing the long-short durational patterning of swing eighth notes. Contrary to Berlin, I suggest the absence of syncopations in dotted-note passages is less indicative of a stylistic difference between dotted and non-dotted passages than a consequence of the difficulty of notating (and reading) both untied and tied syncopations in dotted rhythms. Compare, in Example 10.3, the ease of reading the untied syncopations in the passage shown in (a), as opposed to the same passaged rendered in dotted notation in (b). Parts (c) and (d) present a similar passage involving tied syncopations in straight and dotted rhythms, respectively. The notation of (b) and (d) is visually too busy and simply cumbersome. On the other hand, though examples (a) and (c) are notated "straight," as it were, it is easy enough to perform them in swing eighth notes.

Though ragtime and early jazz composers avoided rendering syncopations in dotted rhythms in the 1910s and beyond, they did not hesitate to

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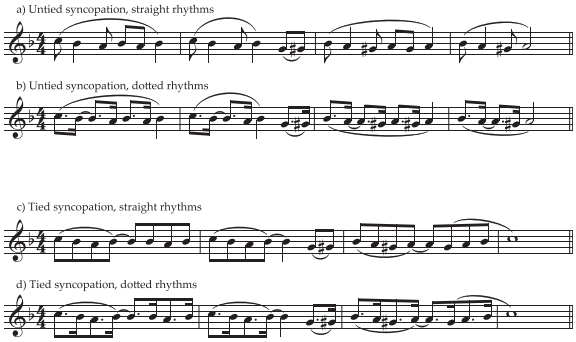
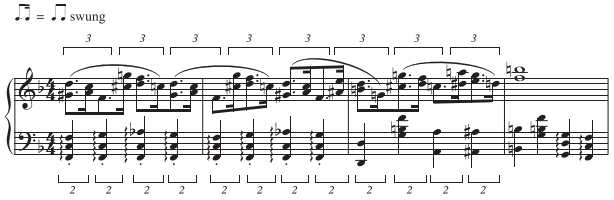
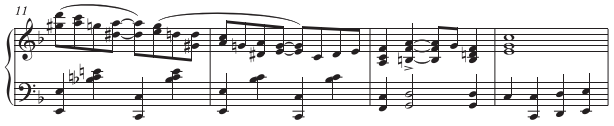


10.3 Comparison of syncopated passages using "straight" rhythms and dotted rhythms



10.4 Confrey, *Kitten on the Keys*, mm. 7–10



10.5 Confrey, *Kitten on the Keys*, mm. 11–14

write secondary rag passages in dotted rhythms, as can be seen in the A strain of Zez Confrey's *Kitten on the Keys*, shown in Example 10.4.[16] In notation, this passage appears to involve a very complex grouping dissonance seemingly impossible to define in terms of an intelligible ratio. But if the dotted rhythms are understood as swing eighth notes, it is clear enough that this is simply a durationally embellished version of a simple 3/2 grouping dissonance (1=8th). Confrey avoids writing dotted rhythms for the tied syncopations in the ensuing passage (Example 10.5), but in his recorded performance, the durational relationships of the notated eighth notes are indistinguishable from those of the dotted rhythms in the preceding passage.[17] Confrey was clearly working in terms of swing eighth notes. He used dotted rhythms in non-syncopated passages to convey this, but simplified the notation to plain eighth notes for clarity in the syncopated passages.

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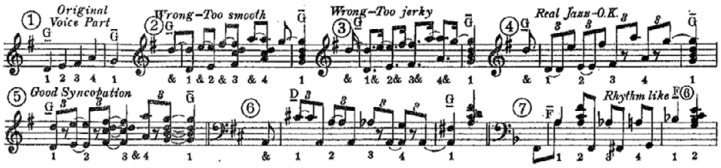

10.6 Possible representations of beat division in jazz performance from Waterman's *Piano Forms*

The term *swing eighth notes* would not enter the jazz vernacular for another few decades, but a few astute observers did recognize both the distinct character of beat division in late ragtime and early jazz and the inadequacy of dotted rhythms to convey the long-short durational relationship between downbeat/upbeat pairs. In 1923, Gilbert Seldes observed that the "fixed groups of uneven notes" in Zez Confrey's *Stumbling*, published in 1922, "are really triplets with the first note held or omitted for a time, then with the third note omitted and so on."[18] Seldes seems to be referring to the quarter-eighth (2:1) triplet rhythm that would later become a standard (if inaccurate) way of describing the "swing ratio." Glenn Waterman was more explicit a year later in rendering jazz rhythm explicitly in terms of triplets. In an explanation of how to syncopate a simple quarter-note melody, he describes dotted rhythms as "too jerky." Good jazz performance, according to Waterman, depends on "[t]he exact 'way' of striking these two-eighths (also *written* as dotted eighth and sixteenth). . . . They *must be played* as a triplet with the first note tied."[19]

Another early commentator, Don Knowlton, retained dotted notes in his discussion of jazz rhythm, but emphasized the difference between what he referred to as the "–*um*-pa-*tee*-dle" pattern of "the real jazz tune" and "the old *one-two, one-two* rhythm" of the march, found in much popular music of the day. The "–*um*-pa-*tee*-dle" pattern, according to Knowlton, serves as the real foundation upon which "are superimposed certain alterations of rhythm which are the true components of jazz."[20] Knowlton, like other advocates of jazz in the mid-1920s, recognized there was something truly distinctive about jazz rhythm, something non-jazz musicians, or even non-Americans, found very difficult to produce. Paul Whiteman, for example, found that "only Americans can really play syncopated music. Musicians of other countries do not seem able to get into the swing of it. They fail to accomplish by training what we do by nature."[21] Virgil Thomson, too, felt there was something quite particular about jazz rhythm. In a detailed

discussion of the expressive effects of jazz syncopation, he proposed that "the peculiar character of jazz is a rhythm, and that that rhythm is one which provokes motions of the body."[22]

Statements like these, which acknowledge the distinctiveness of jazz rhythm and seek to explain its expressive effects, stand in sharp contrast to the contemptuous writings of those like Oscar Thompson, who found little value in jazz and less still of interest in its rhythms:

> There was never a greater absurdity than the talk of rhythmic variety in jazz. Jazz is rhythm in a straight-jacket. Its so-called "variety" is the apogee of monotonous periodicity. . . . It is this very regularity that gives jazz its propulsively forward movement. Its measures are marked with the deadly certainty of a piston rod. Its rhythm is that of the exhaust of a noisy gas engine. No other music the world has known has so approached the mechanics of driven wheels.[23]

Thompson, like other critics, focused his ire on obvious surface features of jazz rhythm – the relentlessly steady pulse or the overabundance of syncopation. Advocates of jazz, however, felt there was something more to it, something deeper about its rhythm that was irreducible, undefinable, unrepresentable; they simply lacked the vocabulary to talk about it, and thus continued to refer to things like syncopation or the use of dotted rhythms – features that could easily be identified, belittled, and dismissed.

At any rate, Thompson's brand of criticism would largely disappear in the 1930s, at least in the United States. Changes in the jazz rhythm section and a more melodic style of performance less reliant on syncopation led to a music less raucous in its rhythmic effects. Jazz entered the commercial mainstream in the 1930s, as well, and with the repeal of Prohibition, its associations with illicit nightlife largely disappeared. Under these conditions, jazz appeared less of a threat to the social order, and its rhythms were no longer invested with as much anxiety.

Meanwhile, on the critical front, the emergence in the 1930s of the modern concept of swing through the activities of French jazz critic Hugues Panassié and the American impresario John Hammond served to redirect criticism of jazz rhythm from the superficiality of surface features to a deeper, more profound rhythmic core, a generative impulse presumably available and accessible only to a gifted elite.

The word *swing* had been employed in writing about music since at least the 1870s to refer to a danceable rhythmic cadence in styles as widely disparate as Verdi operas and Sousa marches. This breadth of usage continued into the 1930s, but by decade's end, the term had come to be associated exclusively with jazz.

There is evidence the word *swing* had entered American jazz musicians' argot by 1933 (it shows up in spoken passages on a few Louis Armstrong records recorded that spring),[24] but no indication they understood it to be a kind of foundational rhythmic essence, Duke Ellington's "It Don't Mean a Thing" notwithstanding. Though premiered in August 1931, recorded in February 1932, and widely popular by 1933, the "swing" of its subtitle and opening line, belted out with such verve by Ivie Anderson, generated virtually no commentary until well into 1935. Rather, its specialized meaning for jazz came from the efforts of Hugues Panassié to translate it into French around the time of Ellington's visit to Paris in July 1933. Finding no suitable French equivalent, Panassié used *swing* as a technical term, conceptually altering an American colloquialism to serve as a critical filter for distinguishing true jazz from false. His notion of swing was then reintegrated into the American understanding by his colleague and friend John Hammond, who wrote about it repeatedly in his column for the *Brooklyn Daily Eagle* in early 1935, when he was actively promoting Benny Goodman's band. By year's end, "What is 'swing'?" would be the question on everyone's lips.

In truth, no one had a good answer – and no one ever has. The problem of definition started with Panassié, who is most responsible for introducing the term to jazz critical discourse through his book *Le Jazz Hot*, published in 1934. Panassié's conception of swing was built on a constellation of five assumptions. First was the notion that swing was a rhythmic quality foundational to good jazz, what Panassié describes as "that essential element of jazz found in no other music." "All true jazz must have swing," he writes. "Where there is no swing, there can be no authentic jazz." Second, though ultimately undefinable according to Panassié, swing was nevertheless an "entirely objective" property, such that "there is almost always complete agreement among competent critics" regarding its presence and intensity in any given performance. Third, swing is a "gift." It is something innate, something a musician is born with: "either you have it deep within yourself," writes Panassié, "or you don't have it at all." Moreover, it cannot be learned: "neither long study nor hard work will get you anywhere in jazz if you do not naturally know how to play with a swing. You can't learn swing." Fourth, there is no single way to swing: "swing varies according to the instrument played," writes Panassié, but even "on the very same instrument, each musician will have his own ways of getting swing." And finally, for Panassié, *swing* was short for *Negro swing*, a property that "belongs to jazz alone and derives from those Negro musicians who first created it." Swing, in other

words, was a rhythmic quality that was ultimately the expression of a black racial essence.[25]

There is plenty to argue with in Panassié's formulation of the swing concept, but by and large, the five basic claims he lays out about swing in *Le Jazz Hot* in 1934, summarized above, continue to serve as the underlying assumptions of our everyday understanding of that concept even today – though most critics wouldn't be so baldly essentialist. This is the modern concept of swing in a nutshell. It crystallized in the popular imagination around 1935, largely as a consequence of Panassié's writings and promotional activities, along with those of his American counterpart, John Hammond.

As an explanation of swing or a guide to how to recognize it or produce it, Panassié's account was an utter failure. But what it made possible was the consolidation of thought about jazz rhythm around a single foundational concept. Swing offered an explanation for the rhythmic particularity of jazz that went beyond surface-level phenomena like syncopation. Swing was not the kind of thing that could be notated and thus co-opted by other forms of music. Syncopation wasn't unique to jazz, of course; it was ubiquitous in the music, to be sure, but not the thing that really distinguished it from other kinds of music. But swing did. It was a deep phenomenon, something rooted in racial essence, and thus something that particularized jazz and explained what made it categorically different from other kinds of music. Never mind that it couldn't be defined; it could be believed. Syncopation was a feature, an effect; swing was an essence, a prime cause.

Panassié's conceptual framework for swing – the five assumptions adumbrated above – served as the critical foundation for discussions of jazz rhythm for decades. Subsequent critics, historians, and scholars repeatedly sought to explain swing and the means of its production, but no one seemed to question Panassié's claim that swing was the essential element of jazz or that it was an objectively real rhythmic phenomenon – or that it was situated in a domain that is difficult, and perhaps even impossible, to access through the intellect. Its power, in Panassié's framework, lies in the mystery of its source and the means whereby it generates its effects, a process hidden from conscious awareness that good musicians can nevertheless actualize without thought or deliberate intention. For Panassié, that source was ultimately to be found in the putative rhythmic effects of race. Countless other scholars have followed his lead in that direction, some more explicitly essentialist than others.

Among the most important post-Panassié critics to undertake an explanation of the swing phenomenon was André Hodeir, who devoted

an entire chapter of his book *Jazz: Its Evolution and Essence* to outlining "the five optimal conditions for the production of swing." These included:

1. the right infrastructure
2. the right superstructure
3. getting the notes and accents in the right place
4. relaxation
5. vital drive[26]

The last of these, "vital drive," was Hodeir's most unique contribution to Panassié's conceptual framework, though his explanation of its character and source is as murky as his predecessor's explanation of swing. Hodeir described vital drive as "an element in swing that resists analysis." It stems from "a combination of undefined forces that creates a kind of 'rhythmic fluidity' without which the music's swing is markedly attenuated." It is, moreover, a "manifestation of personal magnetism, which is somehow expressed – I couldn't say exactly how – in the domain of rhythm." Like Panassié, however, Hodeir saw race as a relevant factor in the production of vital drive; white bands, he found, fail to swing adequately because "their vital drive is weak."[27]

In 1966, ethnomusicologist Charles Keil introduced perhaps the most consequential transformation of the Panassié model.[28] Keil abandoned the racial essentialism of earlier writers, but retained the mysterious nature of swing by situating it in a quality he called "engendered feeling," that certain something beyond notation that performers add to music to generate "vital drive." Engendered feeling, Keil proposed, stems not from syntactical processes – i.e., processes that can be represented in standard musical notation, in quarter notes or eighth notes, for example. It emerges rather from musicians' use of expressive microtiming at the sub-syntactical level in sustaining a rhythmic groove, a phenomenon he later dubbed "participatory discrepancies," or PDs.[29] PDs are a form of rhythmic displacement different from offbeat rhythms, syncopations, or anticipations. In the PD framework, engendered feeling (i.e., swing or vital drive) results from the cumulative tension acquired through "pulling against the pulse."[30] Onset discrepancies, typically on the order of less than about 50 milliseconds (about 1/20th of a second), between the pluck of the walking bass and the drummer's ride cymbal taps in their shared articulation of the beat purportedly generate some qualitative feeling of either rhythmic drive ("push") on the one hand, or relaxation ("layback") on the other.

PD theory thus assigns responsibility for the production of swing to the sub-syntactical realm of microtiming and downplays the significance of

more tangible and visceral events that take place on the syntactical plane of notatable musical phenomena.[31] Whether or not such discrepancies are robust and powerful enough to drive the groove and generate swing remains an open question, however.[32] At any rate, the belief that expressive microtiming has consequential effects in the realm of jazz rhythm has driven a good deal of scholarship in the last few decades. Studies have concerned two types of timing discrepancies in jazz performance: (1) those within a single instrument or part; and (2) those between the instruments of an ensemble. Research on the former has generally concerned the "swing ratio," whereas research on the latter has addressed the "hookup" between bass and drums in sustaining a steady groove, as well as soloists' timing in relation to the drummer's ride rhythm. Most of these studies, incidentally, have concerned timing in straight-ahead jazz, with the bulk of their data coming from laboratory contexts with currently active professional musicians or from recordings drawn from the hard bop repertory of the 1950s.

The "swing ratio" expresses the durational relationship between the long, downbeat eighth note and the short upbeat that follows it. The conventional assumption that successive swing eighth notes stand in a durational relationship of 2:1, traditionally represented in notation as a quarter-eighth triplet pair, has been shown to be largely inaccurate. In practice, swing ratios vary widely, ranging from an even 1:1 to as high as 3.5:1, varying with tempo and ensemble function (i.e., soloist vs. accompaniment).[33] Soloists tend to play minimally uneven swing eighths, typically ranging from about 1.2:1 to 1.5:1. They often vary their swing ratios over the course of a phrase for expressive purposes, either to drive momentum forward or to dissipate motional energy.[34] Soloist swing ratios tend to be most even in the middle of a phrase, but then frequently increase in value toward the end of a phrase, where what Fernando Benadon has referred to as a "BUR surge" tends to serve a closural function.[35]

By contrast, drummers tend to use relatively large swing ratios, particularly in maintaining time on the ride cymbal. Swing ratios in the "ride rhythm," the standard "ding-ding-a-ding" figure played on the ride cymbal since the bebop era, are typically in the neighborhood of 2:1. They tend to be larger at slow and medium tempos, but approach 1:1 in the fastest tempos.[36] Drummers also sustain remarkably consistent swing ratios in the ride rhythm, especially at moderate to fast tempos.[37]

Studies of timing relationships between instruments have revealed interesting practices also related to ensemble function. The "hookup" between bass and drums, in particular, has received a great deal of attention. Bass players tend to synchronize their downbeat attacks quite tightly with the

drummer's ride tap, with generally no more than a 20-ms gap between them.[38] Bass and drums may take turns in the lead, as it were, switching places on occasion for expressive purposes.[39]

Soloists tend to time their attacks with considerably greater flexibility in relation to the drummer's ride tap. They typically lay back on the beat by about 50–80 ms, but then synchronize their offbeat eighth notes quite tightly with the drummer's short tap. Consequently, the degree of delay varies inversely with the swing ratio they employ at any given moment: more delay entails a smaller swing ratio, indicative of more even eighth notes, while less delay entails a higher swing ratio, with greater unevenness.[40]

Eighty-five years have passed since Hugues Panassié published the first comprehensive account of swing in *Le Jazz Hot*. And yet it remains unclear what exactly swing is. Perhaps the most we can say is that it is a word we use to describe an attractive rhythmic quality in jazz, one that is often characterized by a sense of forward propulsion and that presumably has the effect of inducing movement on the part of the listener. However, the fact that no consensus has yet emerged on what exactly swing is or how it is produced suggests that the term has perhaps outlived its usefulness in designating the core component of jazz rhythm. It might be more productive to use Keil's term "engendered feeling," or even Hodeir's "vital drive," to refer to the motional qualities of jazz and other forms of groove-based music – qualities conditioned by the action of "participatory discrepancies." Microtiming studies of both the swing ratio and intra-ensemble "hookup" have begun to clarify at least some of the expressive features of jazz rhythm. But much work remains to be done in integrating the data, most often produced by specialists in music cognition, into a music-theoretical framework of use for music analysis. How do soloists, for example, manipulate microtiming over the course of a single phrase or through an entire solo to expressive effect? How do PDs in the domain of timing interact with those in the realm of timbre and articulation? And to what extent do the data gathered from studies of straight-ahead jazz translate into generalizable features of other jazz styles, or other forms of groove-based music beyond jazz? These and other questions suggest a promising future for the study of jazz rhythm.

Endnotes

1 A "straight-ahead" groove stems from the practices of rhythm-section players from the bebop era through hard bop. It involves "comping" in the piano and/or guitar parts, a walking bass line, and the ride rhythm played on the ride cymbal, with hi-hat snapped closed on beats 2 and 4.

2 For a thoughtful critique of the presumed necessity of "swing feeling" for jazz, see M. Gridley, R. Maxham, and R. Hoff, "Three Approaches to Defining Jazz," *The Musical Quarterly*, 73 (1989), 516–24.
3 M. W. Butterfield, "Race and Rhythm: The Social Component of the Swing Groove," *Jazz Perspectives*, 4 (2010), 301–35.
4 R. A. Waterman, "'Hot' Rhythm in Negro Music," *Journal of the American Musicological Society*, 1 (1948), 24–37.
5 "Ragtime," *The Étude*, June 1899; reprinted in K. Koenig (ed.), *Jazz in Print (1856–1929): An Anthology of Selected Early Readings in Jazz History* (Hillsdale, NY: Pendragon Press, 2002), 51.
6 D. S. Smith, quoted in "Putting Jazz in Its Place," *Literary Digest*, July 5, 1924; reprinted in *Jazz in Print*, 323.
7 E. A. Berlin, *Ragtime: A Musical and Cultural History* (University of California Press, 1980), 106.
8 Ibid., 83. For a catalog of additional rhythmic figures typically found in ragtime, see S. A. Floyd Jr. and M. J. Reisser, "The Sources and Resources of Classic Ragtime Music," *Black Music Research Journal*, 4 (1984), 22–59.
9 Berlin, *Ragtime*, 128.
10 Ibid., 5–6 and 123.
11 D. Knowlton, "The Anatomy of Jazz," *Harper's*, April 1926, 581.
12 H. Krebs, *Fantasy Pieces: Metrical Dissonance in the Music of Robert Schumann* (Oxford University Press, 1999), 31–9.
13 G. Botsford, *Black and White Rag* (Detroit and New York: Jerome H. Remick & Co., 1908).
14 Berlin, *Ragtime*, 147.
15 See, for example, E. Cantrell and R. Williams, "Mississippi River Song – Tapioca," recorded October 2, 1902, originally released as Gramophone 4267; reissued on track 1 of *Ragtime to Jazz, Vol. 3: 1902–1923*, Timeless Historical - CBC 1-085.
16 Z. Confrey, *Kitten on the Keys* (New York: Mills Music Inc., 1921).
17 Z. Confrey, pianist and composer, "Kitten on the Keys," recorded in February 1921, track 3 on *Zez Confrey: Creator of the Novelty Rag*, Folkways RF 28.
18 G. Seldes, "Toujours Jazz," *Dial*, August 23, 1923; reprinted in Koenig, *Jazz in Print*, 248.
19 G. Waterman, *Waterman's Piano Forms: A Course of Invention* (Los Angeles: Waterman Piano School, 1924), 32.
20 Knowlton, "The Anatomy of Jazz," 580–81.
21 Paul Whiteman, quoted in "Say Jazz Will Surely Live," *New York Times*, January 16, 1924; reprinted in Koenig, *Jazz in Print*, 270–71. It is important to note that Whiteman's use of *swing* does not carry the same meanings as the modern sense of the term, as described below. Here, it is synonymous with "get the hang of it."
22 V. Thomson, "Jazz," *Mercury*, August 1924; reprinted in Koenig, *Jazz in Print*, 342–3.

23 O. Thompson, "Jazz, as Art Music, Piles Failure on Failure," *Musical America*, February 13, 1926; reprinted in Koenig, *Jazz in Print*, 452.
24 See the spoken introduction to Louis Armstrong's recording of "High Society," by Porter Steele, recorded on January 26, 1933 (Victor 24232, mx. 74895-1), and the spoken interlude in "Laughing Louis," by Clarence Gaskill, also recorded in Chicago on April 24, 1933 (Bluebird B5363, 75422-2); both titles on *Louis Armstrong: The Complete RCA Victor Recordings*, BMG Classics (09026-68682-2), 1997.
25 H. Panassié, *Le Jazz Hot* (Paris: Editions R.-A. Corrêa, 1934), 4–9.
26 A. Hodeir, *Jazz: Its Evolution and Essence*, D. Noakes (trans.) (New York: Grove, 1956), 197.
27 Ibid., 207–8.
28 C. Keil, "Motion and Feeling through Music," *Journal of Aesthetics and Art Criticism*, 24 (1966), 337–49.
29 C. Keil, "Participatory Discrepancies and the Power of Music," *Cultural Anthropology*, 2 (1987), 275–83.
30 Keil, "Motion and Feeling," 341.
31 For a discussion of the relevance of syntactical pattern in the production of "engendered feeling," see M. W. Butterfield, "The Power of Anacrusis: Engendered Feeling in Groove-Based Musics," *Music Theory Online*, 12.4 (2006).
32 Several studies to date have found no evidence that microtiming variations generate significant impacts on the perceived quality of a rhythmic groove. See, for example, M. W. Butterfield, "Participatory Discrepancies and the Perception of Beats in Jazz," *Music Perception*, 27 (2010), 157–76; G. Madison, F. Gouyon, F. Ullén, and K. Hörnström, "Modeling the Tendency for Music to Induce Movement in Humans: First Correlations with Low-Level Audio Descriptors across Music Genres," *Journal of Experimental Psychology: Human Perception and Performance*, 37 (2011), 1578–94; J. Frühauf, R. Kopiez, and F. Platz, "Music on the Timing Grid: The Influence of Microtiming on the Perceived Groove Quality of a Simple Drum Pattern Performance," *Musicae Scientiae*, 17 (2013), 246–60; G. Madison and G. Sioros, "What Musicians Do to Induce the Sensation of Groove in Simple and Complex Melodies, and How Listeners Perceive It," *Frontiers in Psychology*, 5 (2014), 894; B. Merker, "Groove or Swing as Distributed Rhythmic Consonance: Introducing the Groove Matrix," *Frontiers in Human Neuroscience*, 8 (2014), 454.
33 See especially R. F. Rose, "Computer Assisted Swing!" *Jazz Educators Journal*, 17 (1985), 14–15; M. C. Ellis, "An Analysis of 'Swing' Subdivision and Asynchronization in Three Jazz Saxophonists," *Perceptual and Motor Skills*, 73 (1991), 707–13; A. Friberg and A. Sundström, "Swing Ratios and Ensemble Timing in Jazz Performance: Evidence for a Common Rhythmic Pattern," *Music Perception*, 19 (2002), 333–49; F. Benadon, "Slicing the Beat: Jazz Eighth-Notes as Expressive Microrhythm," *Ethnomusicology*, 50 (2006), 73–98.

34 M. W. Butterfield, "Why Do Jazz Musicians Swing Their Eighth Notes?" *Music Theory Spectrum*, 33 (2011), 3–26.
35 Benadon, "Slicing the Beat," 80–81.
36 Friberg and Sundström, "Swing Ratios."
37 H. Honing and W. Bas de Haas, "Swing Once More: Relating Timing and Tempo in Expert Jazz Drumming," *Music Perception*, 25 (2008), 471–6.
38 Friberg and Sundström, "Swing Ratios." See also Butterfield, "Participatory Discrepancies."
39 J. A. Prögler, "Searching for Swing: Participatory Discrepancies in the Jazz Rhythm Section," *Ethnomusicology*, 39 (1995), 21–54.
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