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CONFLICT, VAGUENESS, DISSOLUTION. CHALLENGES TO METER IN CONTEMPORARY JAZZ

Martin Pfleiderer

Music's temporal structure is organised at various time levels. While the level of musical form corresponds to longer time distances, rhythm refers to the small scale temporal structuring of sonic events. Musical rhythm can be defined as the time structure of a gestalt-like sequence of musical sounds that have differing degrees of salience or accentuation and lie within a time frame of a few seconds (Pfleiderer 2006: 154ff.). Since an event can be accentuated in various ways, e.g. loudness, duration, position within a musical phrase and within its pitch contour, relation to the harmonic and metric context, timbre etc., there are many ways of shaping and perceiving sound sequences as rhythms. Moreover, the temporal structure of what we listen to actively shapes our expectations of what we are going to hear—within a certain piece of music as well as within a musical style. Furthermore, musical expectations and anticipations seem to be a basis and prerequisite for surprise and enjoyment in music—with regard to form, harmony, and rhythm (Huron 2006).

Expectations that are built up in regard to small scale temporal regularities of sound sequences are widely supported and enhanced by our attentional, cognitive and bodily entrainment to music and are commonly referred to as musical meter. Meter is a recurring pattern of attentional energy resulting in more or less stable expectations of what will happen next, and *when* it will happen, respectively. If these attentional peaks are regular, they are perceived as a series of periodic pulses or beats and, if there is a coordinated set of two or more periodicities, as a metrical grid or scheme. In part, this comes naturally to us, not only because we are highly experienced in listening to music and are therefore familiar with various metric schemes or metric templates, but also because regular entrainment is generally widespread in human behaviour. If a regular pulse line or one of these metric templates is

established, we tend to continue to listen according to this pulse or template—even if musical events are in conflict with it or dissolve it temporarily. When we are entrained to music, we even fill in missing elements to mentally preserve our sense of regularity—depending on an ›internal oscillator‹ that generates peaks of expectation.

Meter builds the backbone for listening to and enjoying rhythms and rhythmic music. Moreover, in many music genres, it is the balance between metric simplicity and rhythmic variety, subtleties, and surprises that keeps listeners' attention alive and entails aesthetic as well as bodily pleasure (Pfleiderer 2006). Therefore, a theory of meter will play a crucial role for a general aesthetic and theory of musical rhythm. It has to provide a concise description of regularities and simplicity in music as a point of departure for a general theory of rhythm's complexity and variety. One of the most sophisticated and elaborated approaches to musical meter is Justin London's recent study *Hearing in Time* (London 2012). London's book makes use of a clear and concise terminology. A central merit of London's theoretical approach is his consideration of the empirical rhythm research of the last decades as well as a state of the art discussion of music theory and ethnomusicology. According to London, meter is a »set of periodic temporal cycles of sensorimotor attention« (London 2012: 91) that is organised hierarchically, i.e. within an overall cycle of pulses (or N cycle), there are various sub-cycles, most prominently the beat cycle. Since meter is grounded in recurring human perceptions, there are certain »metrical habits« leading to »metrical templates« that exist on an individual as well as on a culturally shared collective level. London refers to several veridical meters built up by individual listeners, which have the same cardinality and the same arrangement of beat cycle and sub-cycles, as »metrical types« (London 2012: 94ff.). However, according to London, tempo differences are relevant for a distinction between differing meters, too, and lead to so-called »tempo-metrical types«. (If one disregards these differences, several »standard meters«, which mainly refer to beat cycles, remain.)

With regard to the empirical validity of London's theory of meter, the limits of meter perception play an important role. According to London, metric sets of temporal cycles underlie not only stylistic habits but also certain perceptual and logical constraints: so-called »Well Formedness Constraints« (WFC). London formulates four constraint rules that govern the perceptual constraints I will be referring to in the following discussion of musical examples:

> WFC 1.1: Inter-onset intervals (IOIs) between attentional peaks on the N cycle must be greater than ≈ 100 ms.
> WFC 1.2: The beat cycle involves those attentional peaks whose IOIs fall between ≈ 400 ms and ≈ 1.200 ms.
> WFC 1.3: A meter may have only one beat cycle.
> WFC 1.4: The maximum duration for any or all cycles is ≈ 5.000 ms (London 2012: 92).

While these perceptual thresholds—a minimum IOI of 100 ms for pulse perception, 400-1200 ms or 50-150 bpm for beat perception and a perceptual present of around five seconds—are based on extensive empirical research, the declaration that a meter may have only one beat cycle (WFC 1.3) might be called into question by certain multi-part musical contexts characterized by sometimes very complex textures and polyrhythmic structures, e.g. in West African drum traditions. On the one hand, these contexts can be perceived as cross rhythms to a single stable beat, as is argued for instance by Agawu (2006); therefore, they do not necessarily question London's view. On the other hand, several beat cycles of similar salience can often be realised—as some authors implicitly argue (e.g. Locke 2010). London himself resolves this problem by proposing that despite these multiple potential beat cycles, only one beat cycle and therefore one meter can be realised at the same time (London 2012: 104 and 109). London calls these contexts »truly metrical ambiguous« or »latently metrical ambiguous« (i.e. with only a potential for metrical ambiguity). Setting these ambiguous contexts aside, he discusses further cases of metrical perturbation and vagueness (see London 2012: 106-109). According to London, there are short-term mismatches and local perturbations—e.g. offbeat accentuations, syncopation, hemiola, or a »loud rest«—as well as vague metric contexts where one or more normative levels of metrical structure (N cycle, beat cycle, sub-cycle) are absent.

In the following I will discuss several music examples from contemporary jazz where meter and its perceptual constraints are challenged by some of those mismatches, perturbations, and ambiguities, or where meter is only vaguely present or even dissolved and abandoned. While short-term mismatches and local perturbations are widespread in popular music in general—and especially in popular music derived from African American traditions—metrical vagueness seems to occur in more ›art-like‹ musical contexts such as contemporary jazz. Moreover, contemporary jazz serves as an interesting example for a discussion of meter and rhythm in general since it is a strongly rhythmic and metric music that also allows for rhythmic freedom and experimentation. I shall begin by presenting several strategies used to challenge

metric simplicity in more conventional modern jazz. After that, I shall discuss examples of non-isochronous meters in contemporary jazz that also tend to challenge perceptual constraints of meter. Finally, I will outline some examples of continuous tempo changes and strategies employed to dissolve meter, beat, and pulse in contemporary jazz. From these music examples I will draw conclusions concerning the expandability of metric organisation in music, some limitations to London's theory of meter, and perspectives for a general theory of rhythm.

Meter in jazz: short-term mismatches and local perturbations

Jazz is music meant for listening—as well as clicking one's fingers or tapping one's feet. Moreover, jazz performances are full of surprises in regard to their rhythmic structure, especially in some more advanced jazz styles. While people danced to traditional jazz, swing music and sometimes even to modern jazz styles like bebop, hard bop, or acid jazz, styles such as free jazz, avant-garde jazz, or contemporary jazz[1] are more likely to be just listened to. However, despite its bias towards artistic innovation and experimentation, contemporary jazz is still loved for its rhythmic energy and motional character, its rhythmic subtleties and intricacies, and, as I would like to show, the surprises and variety it evinces with regard to metric expectations.

In jazz music from the 1920s to the 1950s, meter is organised quite simply according to a few basic principles (see Berliner 1994: 147-159). Firstly, there is a regular beat and a clear metric framework. In jazz, meter is for the most part organised in 2-beat or 4-beat units. Secondly, beat and meter are marked schematically by a steady walking bass and by figurations in the ride cymbal and hi-hat; additionally, chord changes often mark the beginnings of metric units. Moreover, metric templates may include micro-rhythmic variations or »nuanced patterns« (London 2012: 171ff.) that are characteristic of certain musicians or jazz styles.[2] Thirdly, the tempo ranges from the very slow (ballads, less than 60 bpm) to the very fast (up tempo, up to 300 bpm and more). It is not clear how these very fast tempos that exceed the tempo threshold

1 In the following, I use »contemporary jazz« as an umbrella term for the vast range of avant-garde jazz (see DeVeaux/Giddens 2009: 445-483), i.e. jazz since the 1960s which features artistic innovation and sophisticated experimentation.

2 Although the issues of micro-timing, nuanced patterns and ›swing‹ are very important for jazz and its rhythmic feel, I cannot discuss micro-timing research here (see Berliner 1994: 150-152, Friberg/Sundström 2002, Busse 2002, Benadon 2006, Pfleiderer 2006: 262-273).

for beat IOIs of 400 ms or 150 bpm (see London's WFC 1.2) are processed. Presumably, every other beat is tapped mentally. However, many musicians do not tap beats 1 and 3 but instead beats 2 and 4. Here, as with the backbeat accents on 2 and 4 in many styles of popular music, regular metric mismatches become an essential part of genre-typical metrical habits. Fourthly, the hypermetric framework of most pieces is also quite regular, and often structured according to a strict hierarchy-ranging from 4-beat units to 16-, 32-, and even 64-beat units. Besides the harmonic logic that underlies these units, jazz drummers often emphasize the beginnings of 4- or 8-bar units, i.e. 16- or 32-beat units, with special markers. Additionally, there is some degree of liveliness or play within this metric framework, or rhythmic conflict with it, respectively, since many accents played by the drums, the piano or the soloist emphasize not the beats but rather points in time outside the beat level (so called off-beats). Furthermore, the hi-hat emphasizes beats 2 and 4 instead of the main beats at the start of a measure. These regular metric mismatches are also part of the common metric habit or template in jazz.

Conflict with and perturbation of a beat line or metric grid are essential to the rhythmic character of jazz. In general, mismatches such as syncopation, offbeat accentuation, and hemiola only occur temporarily—challenging the meter, but never neutralising it. However, even within a traditional context, jazz musicians can go very far in challenging the metric framework. A very advanced example of these strategies can be found in performances by African American drummer Elvin Jones. When playing with John Coltrane in the first half of the 1960s, Jones always adhered to the metric framework—even if in many cases one can barely discern this framework merely by listening to his playing without counting the beats. For example, at the peak of several high tempo performances of »Impressions«, Jones obscures the strict metric framework by playing many irregular accents on bass drum, snare drum and cymbals. Additionally, at these performance peaks Coltrane and Jones play a duo on the tenor saxophone and drums; neither the bass player nor the piano player emphasizes the beat or metric scheme. Actually, »Impressions« has a conventional 32 bar-form (AABA), and harmonically it is quite simple modal jazz—with the same modal build-up as »So what« by Miles Davis—even in the duo passage. And although Coltrane plays very complicated lines he clarifies the form by regularly changing the tonal center a half-step upwards when approaching the bridge. In a performance of »Impressions« recorded in Sweden in 1963 (see Putschögl 1993: 169-186) Jones regularly accentuates every third beat at the beginning of both the eighth and ninth chorus—superposing a much slower beat line onto the metric grid (cf. Putschögl 1993: 181).

In an elaborate analysis of a 1961 recording of »Softly, As In A Morning Sunrise« by the John Coltrane Quartet, Paul Berliner shows that Jones in some cases accentuates a second beat line in the tempo of a dotted quarter note of the original tempo over quite a long time and that pianist McCoy Tyner even joins him spontaneously (Berliner 1994: 687ff.). Berliner's description of Jones' playing in »Softly, As In A Morning Sunrise« might serve as a summary of innovative drum playing in the early 1960s:

> The drummer does not restrict cymbals to an ostinato time-keeping role. Sometimes, he withholds hi-hat performance on beat two or four (bars 1, 9); other times he withholds its performance for a measure or more (bars 20-21). Yet other times, he accents beat three (bar 64) or accents the second half of beats (bars 31-32, 41). He frequently plays syncopated ride cymbal patterns, sometimes eliding them with other patterns over the bar line or combining them with complex drum figures. … Additionally he does not limit drum figures to brief punctuations but offers a relatively constant commentary on the performance through extended fills created from diverse elements. Some fills serve as structural markers delineating four- and eight-bar phrases, but they commonly extend slightly over harmonic section boundaries or merge with subsequent passages of intense drum expression (Berliner 1994: 687).

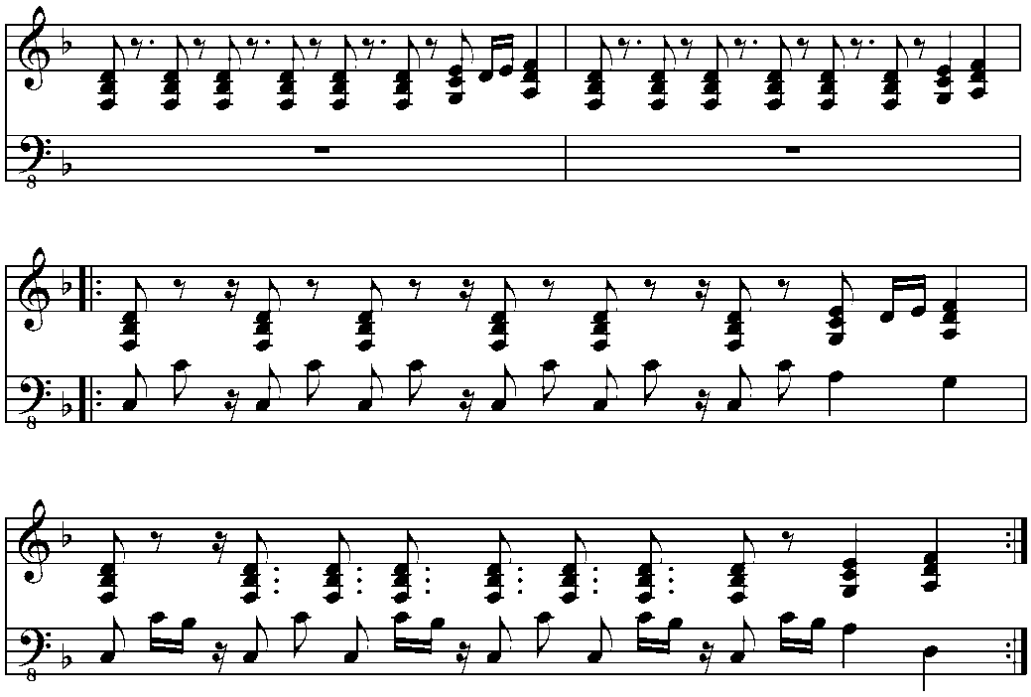
Challenges of non-isochronous meters in contemporary jazz

In general, listening to music with non-isochronous meter still presents a challenge to the metrical habits and expectations of many Western listeners and musicians alike. Non-isochronous meter—sometimes called »odd meter«—was introduced to jazz music in the late 1950s and 1960s by musicians such as Dave Brubeck or Don Ellis (see Pfleiderer 1998: 124ff.). Inspiration came from south east Europe—Don Ellis' pianist was Greek—, from Turkey (cf. Brubeck's »Blue Rondo a la Turk«), and from Indian music. In the beginning, non-isochronous meters were often clarified by cyclical ostinato patterns accentuating the beat cycle or sub-cycles. However, when listening to early jazz recordings with odd meters, one can hear that many soloists had some difficulties in improvising within this framework. Accordingly, some recordings, such as Brubeck's »Blues Rondo a la Turk«, will switch from 11/8 to 4/4 in the solo parts. Non-isochronous meters in jazz grew increasingly complex during the 1970s and 1980s when musicians such as John McLaughlin immersed themselves into the talas and tihais of Indian music (see Danullis 1992, Pfleiderer 1998). In some of McLaughlin's compositions, e.g. »Birds of Fire« recorded with

McLaughlin's Mahavishnu Orchestra, cycles with sometimes several simultaneous non-isochronous sub-cycles are played.

It would be quite interesting to explore how this complex music is perceived. How irregular may a non-isochronous meter shaped by various accents actually be, while still remaining a reliable framework for listeners' attention and expectation? At what point does metric intricacy turn into irregular rhythmic complexity? Presumably, musicians are able to build up complex cyclical templates by practicing and memorizing them over and over again—and if one listens to a piece of music several times, one may learn to expect (and maybe tap) the accents, too. Since pulse and meter sometimes function as a purely prescriptive aid for musicians to help coordinate their actions in ensemble playing, these pulses or beats may differ from the temporarily prevailing perceptive pulse or meter. Note that in several music cultures pulse and meter are not prescribed by counting, e.g. »one, two, three, four«, but are negotiated between the musicians while playing. However, disregarding the musicians' perspectives: What about listeners who hear a piece for the first or perhaps the second time?

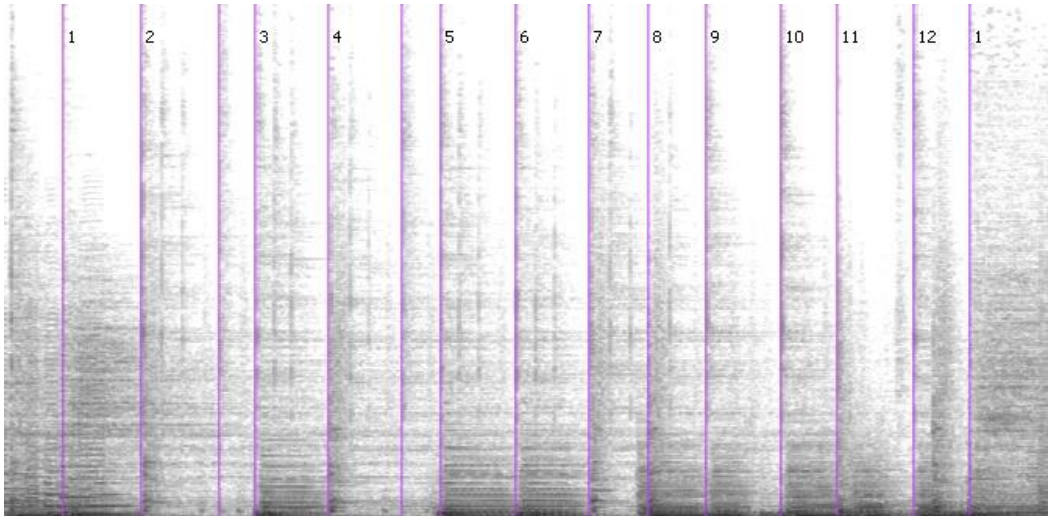
As is generally known, non-isochronous meters are quite common in Eastern European, Turkish, and Near Eastern folk music. One contemporary jazz musician who is deeply inspired by these influences is Israeli double bass player Avishai Cohen. At the beginning of »One for Mark« on Cohen's seminal CD *Continuo* (2006) with Cohen, Sam Barsh on piano, Mark Guiliana on drums, and Amos Hoffman on oud, a cycle of 35 pulses divided into eight non-isochronous beats (5+4+5+4+5+4+4+4) is played by the piano (two times) and by piano and bass (third cycle). The duration of the cycle (ca. 4.9 s), the IOI lengths of the beat cycle (560 resp. 700 ms), and the IOI lengths of the n-cycle lie within the perceptual constraints according to London's Well Formedness Rules 1.1, 1.2, and 1.4. Then, during the fourth repetition, Cohen adds a subdivision of the pulse followed by a regularly spaced line of drums and piano accents that superpose a pulse line in a relation of three to five (see Example 1). This superposition resembles Elvin Jones' playing dotted quarter notes over a quarter note pulse—but in a much more complex metric context. After this, the third and fourth cycles are repeated, followed by an oud melody laid over the ostinato patterns.



Example 1. Avishai Cohen »One For Mark« (2006), first six cycles, piano and bass part only; in the fourth and sixth cycle the drums play the same accents as the piano.

In the next example, the meter is challenged not only by accents deviating from the pulse but also by their performance in a context of high tempo and long cycle period. »Macaca Please« is a composition by pianist Vijay Iyer, recorded in 2008 with Rudresh Mahanthappa, tenor saxophone, Stephan Crump, bass, and Marcus Gilmore, drums. Right from the start of the piece, the fast saxophone and piano lines and the irregularity of the many accentuations played by the drums, piano, and bass tend to overtax the listener's attentional capacities. However, when we reach the piano and saxophone solo parts, a recurring cycle of pulses and accentuations is clearly discernible in the drum and bass parts. Despite the irregular accents, which are constantly varied by additional drum strokes, one may have a vague impression of cyclicity and may even expect when the next accent will occur or when the next cycle will begin. However, it is hard to project these accent cycles onto a regular metric grid.

The cycle that later serves as a cyclical background to the piano and saxophone solos is already introduced in between the two repetitions of the composition. Example 2 is a spectrogram with additional time markers for the accents in the bass and drums.



Example 2. Vijay Iyer Quartet »Macaca Please«, excerpt: cycle played between the two sax themes; the same cycle is repeated later in the piece as an accompaniment for the piano and sax improvisations. The linear spectrogram of the excerpt was computed using Sonic Visualiser software with a 2048 FFT analysis window (Gaussian) and 93.75 % overlapping, frequency range from 86-17894 Hz.

The cycle runs over 24 pulses (IOI ca. 200 ms[3], 300 bpm) and is divided by the accents into beat units of 2+3+2+3+2+2+1.5+1.5+2+1.5+2+1.5, which are marked in the spectrogram by figures 1-12. In some places, an additional fast cymbal pulse is clearly discernible, ordering the accents in a 48 pulse cycle into a 4+6+4+6+4+4+3+3+4+3+4+3 division with a pulse speed of ca. 100 ms or 600 bpm. There are also loud bass tones (G^b, A^b, D and D^b), which fall at almost every beat unit. Table 1 summarizes the cycle features in relation to a 24- and a 48-cycle:

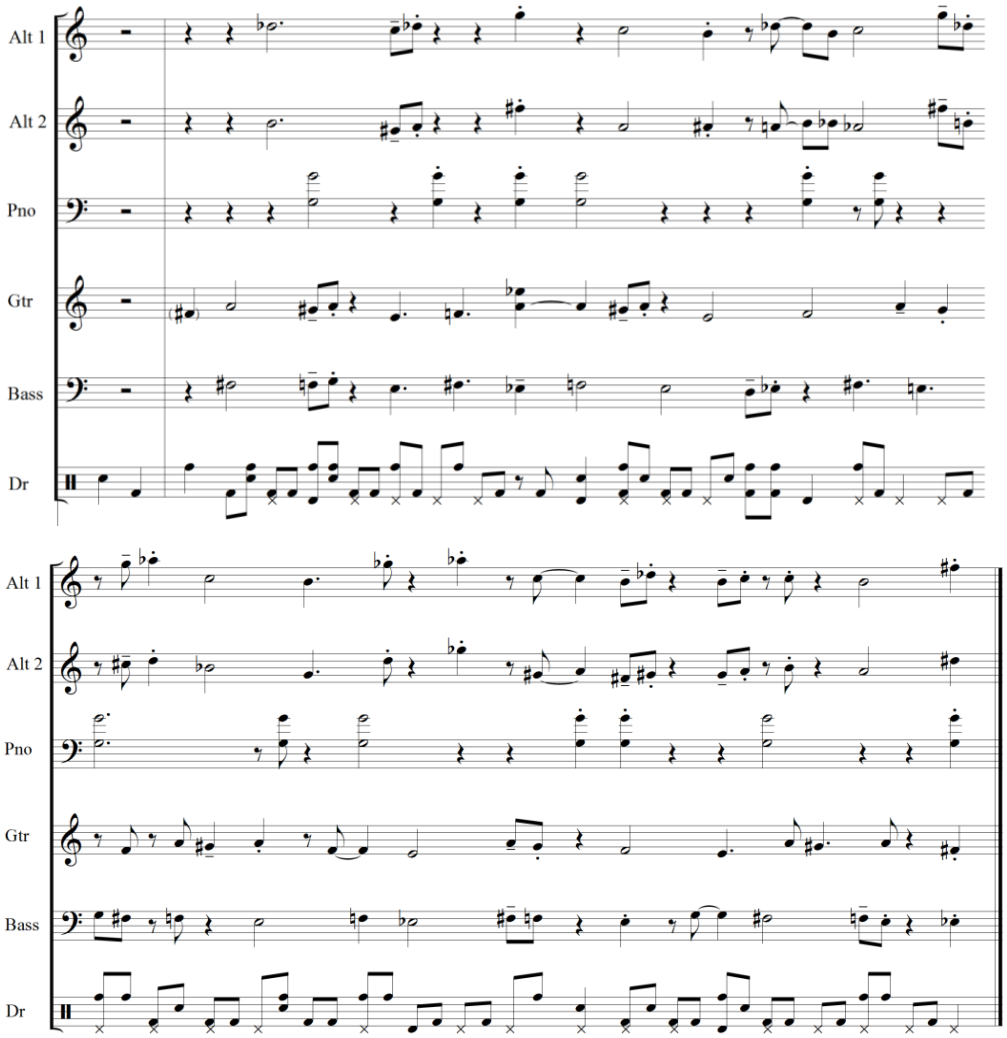
3 In the interest of clarity and easy comprehension, I rounded the actually played IOIs—which in fact are slightly higher and differ a little bit—to this more easily readable mean value.

Spectro-gram markers	1	2	3	4	5	6	7	8	9	10	11	12
Bass line pitches	G^b	—	G^b	—	A^b	A^b	D	D	D	D	D	D^b
Approx. duration in ms	400	600	400	600	400	400	300	300	400	300	400	300
24-cycle (IOIs ≈ 200 ms)	2	3	2	3	2	2	1.5	1.5	2	1.5	2	1.5
48-cycle (IOIs ≈ 100 ms)	4	6	4	6	4	4	3	3	4	3	4	3

Table 1. Vijay Iyer Quartet »Macaca Please«, cycle structure summary (see text for explanation).

The pulse IOIs of the N cycle lie around 100 ms—this being the perceptual constraint according to London's WFC 1.1. The overall length of the cycles is about 4.8 s and therefore lies just below the 5-second-threshold for cycle length according to London's WFC 1.4. However, if the sub-cycle described above is taken as a non-isochronous beat cycle of twelve beats, then the IOIs of some of the beats are only 300 ms long and therefore shorter than the threshold of 400 ms according to WFC 1.2. In addition to the irregular accentuations and the long cycle-length, this leads to an impression of metrical vagueness—or of playing and listening at the boundaries of metric-cyclical perception.

In the third music example, »Cross-Fade«, composed by saxophone player Steve Coleman and recorded by Steve Coleman and Five Elements in 1991, there definitely is an isochronous beat within a medium up tempo (beat IOIs 418 ms or 143.5 bpm). However, it is hard to discern any regularity beyond the beat level and its subdivision into two equally spaced IOIs—even after listening to the piece several times. Admittedly, the musical surface is not one of arbitrary chaos, since there is some vague sense of regularity. In the score, available online at Coleman's website (Coleman 2002, see Example 3), there *is* a certain regularity—but only over a cycle of 36 beats lasting about almost 16 seconds. This cycle length is much longer than the maximum cycle duration of five seconds according to London's WFC 1.4. The cycle is repeated several times while the composition (lasting exactly one cycle) is played either by the entire group or by several members of the band while individual members improvise consecutively for one cycle each. Although the 36-beat cycle is divided into four units of 9 beats in the score, those units are neither marked by any accentuation nor by any recurring sonic event.

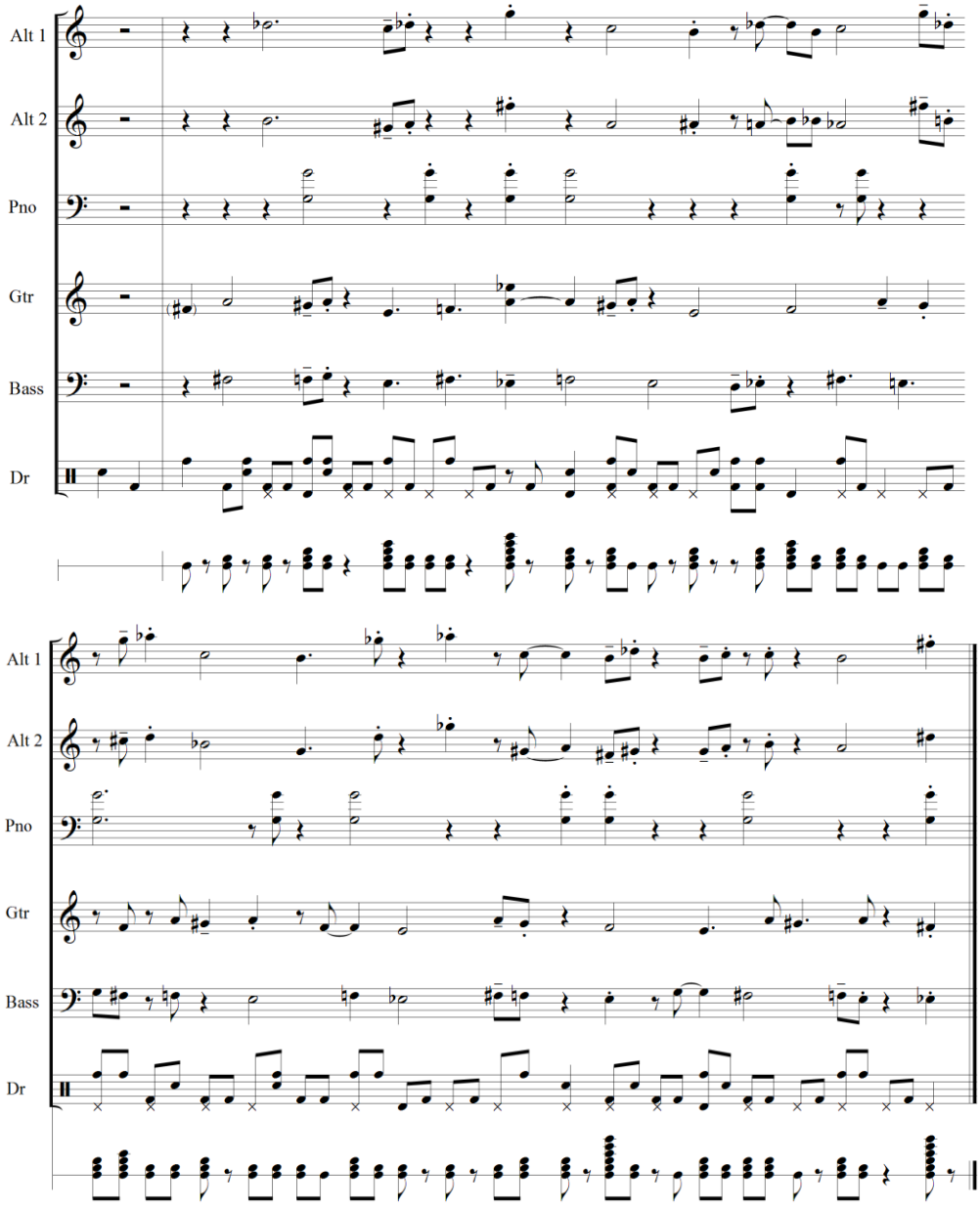


Example 3. Steve Coleman »Cross-Fade«, score (Coleman 2002), bar lines are omitted.

In order to identify regularities within a rhythmic texture that may be hidden by music notation but are relevant for perception, a rhythm score—an analytical device designed by Peter Petersen (1999, 2010)—may be used. In short, Petersen's approach seeks out rhythmic regularities within a score by summing up several rhythm components, e.g. note onsets, peak notes in melodic contour, longer notes etc., to create an overall combined rhythm—or rhythm profile, as Petersen terms it. If this rhythm profile contains regularities, then, for Petersen, a meter emerges—otherwise it does not.

Petersen's conception of the rhythm profile has a number of shortcomings. It is not at all clear which components are perceptually important in a certain piece of music or for a certain listener. Therefore, the selection of rhythmic components for analysis remains somewhat arbitrary. The same holds true for how the components are to be weighted against each other

(see Müllensiefen/Frieler/Pfleiderer 2009). Moreover, Petersen completely ignores learned metric schemes, which could easily lock into place while listening to music. On the other hand, a rhythm score can be very helpful in providing a vague impression of a rhythmic texture and its factual regularities. In the rhythm profile of »Cross-Fade« (see Example 4) only the onsets of the various instruments are summed up—except for the drums, which are omitted, since the drum part plays almost every eighth note, and it is hard to determine which of the manifold drum components are the most salient.

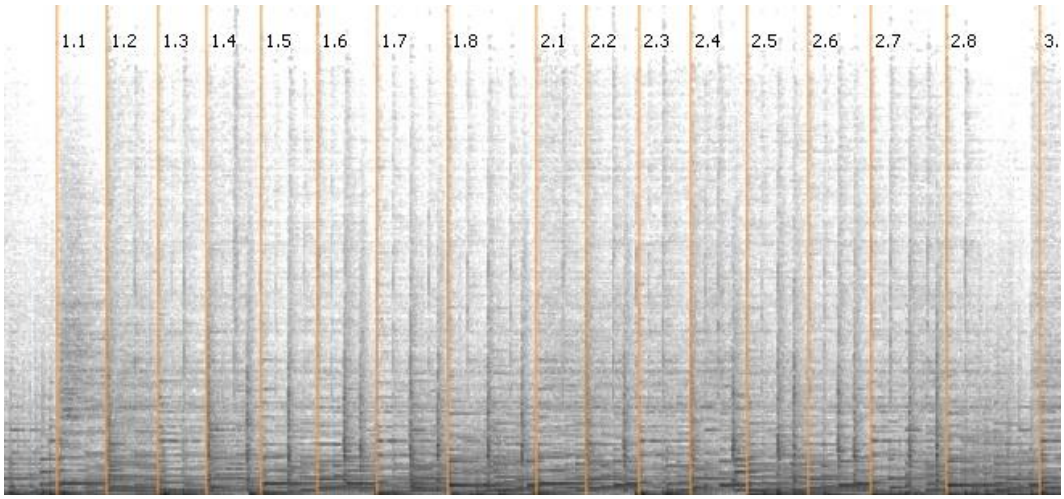


Example 4. Steve Coleman »Cross-Fade«, score (Coleman 2002) without bar lines; the rhythm profile below each system results from adding the number of tone onsets in all the instruments except the drums.

One can easily see from the rhythm profile at the bottom of the score that some pulses are more accentuated than others. However, no sense of regularity emerges from this. The metric grid in the score of »Cross-Fade« can, therefore, only serve as a »prescriptive« aid for musicians. From a perceptual perspective, however, »Cross-Fade« contains only a vague metric context.

Continuous tempo changes

For several decades, a steady tempo seems to have been an immutable aspect of jazz music. Back in 1960, early attempts by trumpet player Don Ellis and his quartet to play with constantly changing tempos were recorded and released on the album *How Time Passes*—the title alluding to ideas formulated by the German composer Karlheinz Stockhausen (1957). Recently, other jazz musicians have once again begun to experiment with tempo changes, e.g., again, American pianist Vijay Iyer, whose piece »Macaca Please« was featured above. In the last part of »Historicity«, the eponymous track of a much praised CD recorded by the Vijay Iyer Trio with Iyer, Crump and Gilmore, the music starts to slow down as in a final retardation (beginning at 6:11). After every eighth beat, however, the music cyclically returns to the initial tempo. Example 5 shows a spectrogram of the first two retarding cycles, in which I have marked the actual beats (1.1-2.8). We can discern that the slowing down starts only slightly with beat five or six, followed by a pronounced slowing down during beats seven and eight. The durations of the corresponding IOIs lie around 600 ms (100 bpm) at first, while the IOI from the final beat (1.8) to the first beat of the next cycle (2.1) is around 1.2 s or 50 bpm, followed by an abrupt doubling of the tempo to the initial 100 bpm. These repeated retardations resemble a sonic version of a picture by M.C. Escher.



Example 5. Vijay Iyer Trio: »Historicity«, beginning of the retardation. The linear spectrogram of the excerpt was computed using Sonic Visualiser with a 2048 FFT analysis window (Gaussian) and 93.75 % overlapping, frequency range from 86-17915 Hz. Lines mark the beats of the first two retarding cycles (1.1-1.8 and 2.1-2.8).

In another composition by Vijay Iyer, the title track of the CD *Accelerando*, the music is clearly cyclical, allowing for some measure of metrical expectations, however vague. But here, unlike the ending of »Historicity«, the beat speeds up and slows down cyclically. Despite the absence of an isochronous pulse in both pieces, there are probably metric templates which contain those cyclically repeated and continuous tempo changes—as London argues in his *Many Meter Hypothesis* (see London 2012: 188). However, while continuous tempo changes are almost a conventional part of European music of the 19th century, playing with tempo as excessively as Iyer does in these two recordings is uncommon in both jazz and popular music and therefore presents a considerable challenge to metrical habits.

Dissolution of meter, beat, and pulse in free jazz

Ever since the early 1960s, avant-garde jazz pioneers such as Cecil Taylor and Ornette Coleman and their respective drummers have developed new and unconventional approaches to musical time. Not only is the meter challenged by mismatches and perturbations in their music, many metrical habits of beat and pulse are dissolved entirely. The earliest recorded and commercially released example of the dissolution of beat and pulse is, to my knowledge,

an improvised piece entitled »Cindy's Main Mood«, performed in 1960 by Cecil Taylor on piano, Buell Neidlinger on bass, and Billy Higgins on drums. The piece starts with a fast pulse established by Higgins on the cymbals. Then, with a bass solo in the middle of the piece, the tempo slows down. Suddenly, Cecil Taylor takes the initiative with some more or less repetitive piano patterns and Higgins reacts with drum accents and drum patterns similar to the piano playing—although both of them avoid any sort of steady pulse or beat. At the end, after a minute or so, Higgins reverts to the fast cymbal pulse.

Strategies for dissolving the beat and pulse in avant-garde jazz and free improvised music and for shaping musical time beyond pulse, beat, and meter are a fascinating, but elusive topic of research, and one that is hitherto widely unexplored. So far, I have discovered three or four differing strategies and approaches in the music of avant-garde jazz drummers such as Sonny Murray, Andrew Cyrille, Rashied Ali, or—in Europe—Tony Oxley, Jon Christensen, and many others. Firstly, streams of irregular accents are played—while nonetheless being interactively coordinated within an ensemble. It seems as if the individual musicians simultaneously transfer their differing ›inner times‹ into slightly pulse-like streams which, moreover, influence each other. In order to ensure a coordinated performance, the individual pulses must remain elastic and flexible so that they may accelerate and slow down fluidly. Additionally, there are ›temporary islands‹ of repetition, of clearly shaped patterns and figurations of pulses—metric regions of regularity which emerge and dissolve again seamlessly. Furthermore, there are temporary insinuations of metric schemes, e.g. the well-known cymbal or hi-hat patterns which, however, are often played at slightly changing velocities. Finally, there is a rhythmically complex density of events resulting in an impression of high intensity, energy, and speed.

Conclusion

Contemporary jazz offers various opportunities for studying the interaction between metric regularity and different kinds of rhythmic diversity and complexity that challenge metric simplicity and make music rhythmically interesting, surprising, and enjoyable. Most prominent are irregular accents (syncopations, offbeat accents etc.) and alternative pulse lines (hemiola etc.) as can be heard in the recordings of Elvin Jones, or Avishai Cohen. Those »mismatches« and »perturbations« (London 2012: 106f.) in relation to the regular metric template are even more challenging when they occur within

high tempo, long metric cycles, and non-isochronous metric frameworks (cf. Vijay Iyer's »Macaca Please«).

Moreover, the more general question arises as to whether repeated accent patterns might function as metrical templates and habits. If, according to London, differing tempos as well as different micro-timing patterns (»pattern nuances«) lead to different meters, why then should recurring rhythmic patterns such as the rock backbeat (2 and 4), the ride cymbal and hi-hat pattern in jazz, as well as more complex but cyclically repeated accent patterns or similar, not become metric habits, too? However, it is not at all clear when exactly a cyclical accent pattern that induces precise temporal expectations will lead to a metric habit or template. Presumably, this issue cannot be solved theoretically but must be examined empirically. Most likely, the same cyclic structure that—for one listener—appears to be merely a complex sequence of irregular accents, could—for another—serve as a metric template and habit; or, as London puts it in his *Many Meter Hypothesis* with regard to timing nuances:

> A listener's metric competence resides in her or his knowledge of a very large number of context-specific metrical timing patterns. The number or degree of individuation among these patterns increases with age, training, and degree of musical enculturation (ibid.: 182).

Again, this leads back to the point that the role of meter could be different for someone who listens to music and someone who plays music. There are cases where meter serves as a reliable frame for temporal coordination between musicians while listeners get no or only a weak impression of metric organisation—see Coleman's »Cross-Fade« or the manifold examples of non-isochronous meters that are unfamiliar and barely comprehensible to many Western listeners. Concerning this issue, I tend to differentiate between a »prescriptive meter« and a »descriptive« or »perceptive meter«, relying on Charles Seeger's (1958) pivotal distinction between prescriptive and descriptive music notation.

In general, London's approach to meter has proven very helpful for the analysis of contemporary jazz. Moreover, it would seem that the perceptual constraints for the IOIs of the n-cycle and beat cycle, as well as for the overall cycle length, are of high relevance for musicians when shaping complex rhythmic structures ›at the edge‹ of perceptibility—and beyond. However, I wonder whether London's terminology might not carry the implication of subcutaneous aesthetical preferences. From a perspective of aesthetic perception, the judgmental term »well formed« meter, according to London's WFCs, should ideally be exchanged for something like »easily perceptible«

meter (and therefore Easy Perceptibility Rules EPR), since those meters are not *aesthetically better formed* in the first place than vague or ambiguous metric contexts—for some listeners and musicians exactly the opposite may be true. From an aesthetic point of view, I also doubt that it is appropriate to speak of »perturbations« and »mismatches« in the case of syncopations, hemiola etc.—because perturbations and mismatches tend to label musical events as mere deviations from a normative order. Admittedly, meter is a human capacity, necessary for working together as well as for playing tennis, squash or ensemble music. However, although musical meter is a necessary perceptual framework for reducing rhythmic complexity, what makes music interesting and aesthetically enjoyable in many cases are its rhythmic variety and the temporal challenges to metric simplicity presented by various musical strategies—which are, then, more than »perturbations« of a normative order. Additionally, in some cases, meter does not appear to be at all necessary for an aesthetic enjoyment of music in general and rhythmic music in particular. Playing and listening to contemporary jazz and improvised music without a reliable meter or regular pulse exemplifies that the processes of negotiating time between musicians may well be a source of aesthetic pleasure for musicians and listeners alike.

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Abstract

In contemporary jazz a definite beat or a clear metrical framework are sometimes challenged by rhythmic mismatches, perturbations, or ambiguities. In the paper, some of these phenomena are discussed in the light of Justin London's theory of meter. After a short introduction in London's approach, at first, strategies used to extend metric organisation in more conventional modern jazz are presented. Then, several examples of non-isochronous (or »odd«) metric organisation that challenge constraints of meter perception are discussed. Moreover, continuous tempo changes in contemporary jazz as well as strategies employed to dissolve meter, beat, and pulse are outlined. Finally, conclusions concerning the expandability of metric organisation in music are drawn and both limitations to London's theory of meter and perspectives for a general theory of rhythm are discussed.