Experimentations with Timelines: Strategies of Rhythmic Complication in Afro-Bahian Jazz

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TIMELINES are memorable patterns that serve as temporal organizers in various types of music. In some eighty years of scholarship we have learned about their function and varieties in traditional contexts across the Atlantic,[1] but what happens when they are deliberately truncated, expanded, rotated, or staggered? This paper explores some compositional techniques used by Orkestra Rumpilezz, a big band from Bahia, Brazil, that combines jazz with Afro-Bahian music and bases its compositions on traditional and modified timelines. I offer metric interpretations of these timeline experimentations and relate them to the orchestra's stated goal to "dignify and demonstrate the high level of rhythmic complexity of Afro-Bahian music" (Letieres Leite, p.c. in Salvador, 27 April 2012). I will show that composer–director Letieres Leite's experimentations with timelines are a technique to increase rhythmic complexity and ultimately to elevate the status of Afro-Bahian music. Additionally, I explore the diasporic connections of Rumpilezz's project by proposing a way to analyze and expand existing timeline models to account for more subtle and implicit relationships of timeline alignment found in Brazil.

My guiding questions are as follows. What is the role of timelines in Rumpilezz's music? How and why does Leite modify traditional timelines? In what ways can we conceptualize these experimentations? And finally, how do these experimentations relate to discourses of blackness in Brazil? My goal is to discover how the orchestra's claimed rhythmic complexity is expressed through careful manipulation of materials via the musical arrangement.

I adapt the concept of binary clave orientation common in Afro-Cuban music and Chris Stover's (2009) waves of rhythmic consonance and dissonance to propose metric interpretations of various timelines and their rotations used by the orchestra. My analysis is contextualized with ethnographic fieldwork in Bahia in 2012, interviews in Ghana in 2016,[2]

1. Although Kwabena Nketia (1963) is credited with introducing the timeline concept, scholars have identified and written about the importance of bell patterns in African and diasporic ensembles since the 1930s. Among the earliest writings explicitly discussing clave function in Afro-Cuban music are Emilio Grenet's *Popular Cuban Music* (1939) and Alejo Carpentier's *La música en Cuba* (1946).

2. Letieres Leite, the director of Rumpilezz, claims that timelines are foundational structures in *all* African derived music (SESC 2014). Of course, there is much African and diasporic African music that is not organized around timelines (e.g., funk, soul, blues, some types of jazz, etc.). Below I include a metric interpretation of a Rumpilezz piece ("Anunciação") based on a truncated version of the so-called West African standard pattern, <2212221>, provided by a Ghanaian Ewe master drummer who is fully familiar with the traditional pattern and with many Ghanaian grooves organized around it (e.g., *agbadza*, *atsiagbekor*, etc.). This is not to suggest that Afro-Bahian music aesthetics can be tested or viewed through a Ghanaian lens, but to study how individuals who have a high level of familiarity with the standard pattern may interpret some of its transformations.

Rumpilezz's rhetoric about the role of rhythm and timelines in African-derived music, and contemporary scholarship on timelines.

The repertoire I analyze, available on two Rumpilezz albums (*Letieres Leite and Orchestra Rumpilezz*, 2009, and *A Saga da Travessia*, 2016) represents a body of work in which composer Leite treats timelines uniquely for each piece. For a closer analysis I focus on three pieces from the former album, "Anunciação," "Adupe Fafá," and "Floresta Azul," and four from the latter, "Banzo Pt. 1," "Honra ao Rei," "Feira de Sete Portas," and "Dasarábias."[3]

I first introduce the orchestra and its rhetoric about rhythmic complexity and timeline centrality. Second, I discuss theories of timeline function as they may relate to Leite's arrangements. Lastly, I analyze Leite's timeline experimentations and propose a reading of his compositions based on some of their patterns of timeline alignment.

ORKESTRA RUMPILEZZ

The word Rumpilezz combines the names of the three sacred drums of Candomblé in the Nagô (Yoruba derived) tradition—*rum*, *rumpi*, and *lê*—plus the last two letters of the word "jazz." This evokes the music's main constituent musical languages. Additionally, the orchestra draws inspiration from Bahian carnival grooves, which Letieres Leite sees as the other main component of Afro-Bahian percussion, along with Candomblé. These sources of inspiration have led Leite to claim that Rumpilezz is "very close to its African roots" (p.c. in Salvador, 27 April 2012).

The orchestra spotlights percussion in various ways. Leite replaced the typical big band rhythm section of piano, bass guitar, and trap set[4] with Afro-Bahian instruments from Candomblé (*rum*, *rumpi*, and *lê* drums and a double-mouthed bell called *agogô*) and carnival (three large bass drums or *surdos*, a snare drum or *caixa*, two conic hand drums called *timbais*, rattles or *caxixis*, and two small conic drums or *repiques*). He organized the musicians on stage in two semicircles as shown in Figure 1: an inner one formed by the percussionists and an outer one with the brass players. This layout reflects the way Leite conceptualizes Rumpilezz: "it is not a big band accompanied by percussion, but a percussion group accompanied by a big band" (Jackson 2008). Additionally, while drummers wear elegant tuxedos and leather shoes, horn players dress informally with shorts, T-shirts, and sandals. The contrast is acute.

3. All pieces composed and arranged by Letieres Leite.
4. Since 2013 the orchestra has included trap set in a few of their live performances, particularly when performing at jazz festivals. See, for instance, https://www.youtube.com/watch?v=V_1dExO7EH4 (performance at SESC Jundaí, São Paulo, 2016). However, trap set has not been used in any of their albums.

Figure 1. Orkestra Rumpilezz on stage (source: www.rumpilezz.com).

A Discourse of Rhythmic Complexity

Kofi Agawu (2003) has written that the notion that musics of Africa and the diaspora are centered on rhythm often reflects orientalist views and conveniently emphasizes a perceived difference between Africa and the West—rhythmicity becomes emblematic of otherness. For Paul Gilroy (1993, 100), despite the problems of this view, namely its essentialism and exceptionalism, it has a strong appeal for the affirmation of black Atlantic culture (a term Gilroy uses to emphasize the connection between continental Africa and its Atlantic diaspora). In other words, rhythmicity and other essentialist notions serve activists, authors, and musicians to advance Afrocentric agendas and discourses of black empowerment. Take, for instance, a fragment of Molefi Asante's Afrocentric manifesto: "African culture takes the view that an Afrocentric modernization process would be based upon three traditional values: harmony with nature, humaneness, and *rhythm*" (Asante and Asante 1985, 6, my emphasis).

In Bahia many musicians, including those of Rumpilezz, use the notion of rhythmic complexity for black pride and self-fashioning. In a conversation, Gabriel "Gabi" Guedes, a well-known Candomblé drummer from Bahia and the principal percussionist of Rumpilezz, declared: "in Candomblé you have a great variety of rhythms. Even, odd, broken. Everything. [These rhythms are] much more complex than those featured in popular or art music" (p.c. in Salvador, 1 May 2012). He is aware that his knowledge of grooves perceived as *complex* increases his prestige and employability in the music market where he makes his living. Rhythmic complexity is a source of empowerment for Guedes as a black individual and as a professional musician. In a TV interview in 2014, Leite declared:

> In reality Rumpilezz is a project to think about Afro-Bahian music . . . the orchestra was not created to entertain audiences or to be a job option for musicians. It was created to prove an idea that I have been defending for a long time, which is the high level of

> organization of [Afro-Bahian] percussion and its high level of structure and complexity. (SESC 2014)

Music can be rhythmically complex in many ways. It can be extremely dense, have very little repetition, suggest various competing pulses, lack the sense of a pulse, be metrically unstable, and more. Rhythmic complexity is multifaceted and can be studied from different perspectives; for instance, one can focus on the difficulties of processing, perceiving, or producing a rhythm. And all of these elements may be affected by tempo, familiarity, context, and the underlying meter. Thus, it is not surprising that many authors have noted that it is difficult, if not impossible, to find a satisfactory definition of rhythmic complexity that takes into account all aspects of rhythm or that is applicable to repertoires across cultures (Clayton 2000, 6; Toussaint 2013, 108).[5] How do we arrive, then, at a working definition of rhythmic complexity applicable to Rumpilezz's music and its audience?

Since Rumpilezz's discourse of rhythmic complexity is only effective to the extent that its audiences can *perceive* said complexity, this study is primarily concerned with the perceived complexity of Rumpilezz's arrangements, particularly of their modified timelines. Among many possible factors affecting complexity, *metric strength* and *syncopation* are especially relevant because they help determine to what degree a rhythm agrees with the reference structure that listeners may have in mind. *Ambiguity* is another factor, because it may determine whether competing interpretations emerge, and so is *familiarity*: the audience's ability to recognize the patterns coming from the orchestra's sources of inspiration. Let us briefly examine each.

Metric strength indicates the extent to which the onsets of a rhythm coincide with metrically strong positions. Various authors have explained that the hierarchy of metric accents of Western art music described by Lerdahl and Jackendoff (1983) does not account for the ways in which timeline-based musics are constructed, performed, and perceived (Chor 2010; Toussaint 2015). In these musics the relative weight of each beat is based less on a given hierarchy than on where the onsets of the timeline coincide with the metric beats. For instance in son clave, <33424>, beats one and four have more weight than beats two and three. In any case, the assumption is that metric strength opposes rhythmic complexity because it makes the rhythm *agree* with a reference structure that is embedded in the listener's mind, thus facilitating its processing. And, in the case of clave-based music, the more the rhythm reinforces beats one and four, the less its perceived complexity will be.

Syncopation, on the other hand, opposes metric strength in that it refers to the extent to which a rhythm coincides with metrically weak positions. In other words, syncopation

5. Ethnomusicologists have typically avoided the use of complexity as a category of analysis for rhythm, perhaps due to a disciplinary tendency to avoid the reification of hierarchies based on implied dichotomies between simplicity and complexity. The study of this phenomenon has been mostly pursued by scholars in computer sciences (e.g. Thul 2008; Toussaint 2013), and in music cognition and perception (e.g. Keller and Schubert 2011; Povel and Essens 1985; Pressing 2002; Shmulevich and Povel 2000).

increases rhythmic complexity as it makes the rhythm *misalign* with the implied meter. This direct association of syncopation with rhythmic complexity has been widely assumed in scholarship (e.g., Fitch and Rosenfeld 2007; Keller and Schubert 2011). But syncopation is more than off-beatness. It can also be measured against other rhythms in a polyrhythmic texture, particularly against timelines, since these are also considered to be reference structures in their own right (this will be discussed in the section "Timeline Function"). Here one could perhaps use the concept *timeline strength* to refer to the degree of agreement of a particular rhythm with a timeline. Syncopation with respect to *either* the meter or the timeline makes the rhythm more complex.

Ambiguity is another concept that various authors and musicians associate with complexity. Referring to the so-called New Complexity Movement, composer James Boros (1994, 91) wrote, "Music that is perceived as complex seems actively to encourage the coexistence within a single hearing and amongst different hearings, of multiple viewpoints, implying the presence of a high degree of ambiguity with regard to its 'true' identity." This coexistence of hearings, for instance, of competing pulse streams in a polyrhythmic texture, can create what Jeff Pressing (2002, 299) calls perceptual rivalries, "a kind of cognitive dissonance, a contradiction between interpretations." For Pressing, perceptual rivalries are "established foundations of Black Atlantic rhythmic design" (ibid.). He continues by explaining that the main techniques for the establishment of perceptual rivalry are "syncopation, overlay, displacement, off-beat phrasing, polyrhythm/polymeter, hocketing, heterophony, swing, speech-based rhythms, and call-and-response" (300–301). Pressing's account of rhythmic ambiguity is relevant not only because he refers to black Atlantic and timeline-based music, where Rumpilezz desires to be located, but especially because it reinforces a discourse of rhythmic complexity in African and African-derived music.

Finally, a degree of familiarity with a musical style is crucial in measuring perceived rhythmic complexity. Intuitively, the more familiar one is with a rhythm and its style, the more recognizable and less complex it will appear. This is obvious for audiences familiar with Candomblé music who can easily recognize timelines, drumming patterns, and song melodies used verbatim by Rumpilezz in pieces like "Floresta Azul." However, there are cases where familiarity with one rhythm may increase the perceived complexity of another one resembling that rhythm in some ways but contrasting with it in others (e.g., the beginning of the two rhythms may be identical, but the endings different). This could also be seen as a case of ambiguity where a competing interpretation of a pattern is triggered by its resemblance with a familiar pattern. Because Rumpilezz's music is largely based on modified versions of timelines known to their intended audiences, familiarity bears high relevance in the discussion of the orchestra's discourse of rhythmic complexity.

For the particular purposes of this paper, rhythmic complexity is studied in terms of the distance between the pattern that served as inspiration for the orchestra and its modified version. *Rhythmic distance* is a qualitative parameter indicating how similar or different two

patterns are with regards to metric strength and timeline strength. Additionally, ambiguity and familiarity are considered.

A Timeline-Centric Discourse

Most musicians I met in Bahia spoke about the importance of bell patterns as temporal organizers of Afro-Bahian grooves.[6] But Leite's public rhetoric was outstanding:

> For me all types of African music follow a rigorous system of claves. Clave is the smallest rhythmic unit around which music revolves. I thought, why not [create] instrumental music based on those [clave] ideas. I learn a rhythm, then I deconstruct it, and finally I construct it again for the rest of the instruments.[7] (SESC 2014)

This technique is publicly celebrated by other members of the orchestra. In another interview on Brazilian national television, Rumpilezz trumpet player Joatan Nascimento declared:

> the idea of Letieres [Leite] to identify that intrinsic relationship between [the Candomblé] toque and clave means that from now on, no one will use those toques [for musical arrangements outside of the ritual context] without taking into account its clave. Everything is linked [to those claves] and that is for me, the biggest contribution of his work. (TV Brasil 2012)

This level of detail in explaining how music is made is atypical of public declarations of musicians in Brazil. Between Rumpilezz's performances and his highly technical descriptions of claves, Leite has earned a national reputation as one who understands the essence of Afro-Bahian music among Brazilian popular musicians, classically trained musicians, carnival percussionists, national media, Candomblé communities, some American jazz musicians who have visited Brazil, and more.[8] He is routinely invited to other Brazilian cities to perform with the orchestra and to teach workshops on Afro-Bahian music.

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6. All my teachers of Afro-Bahian music in Salvador, including Gabi Guedes, Macambira, Ricardo Costa, and Renato Kalile, explained that in an ensemble the person playing the timeline is akin to an orchestral conductor because the rest of the musicians, singers, and dancers need to listen to them and use them as a temporal reference. These musicians used a variety of terms to refer to timelines, in most cases using the name of the instrument that materializes it—e.g., *padrão do agogô* (*agogô* pattern). The term "clave" is also used by these and other Bahian musicians (Leite included), but as a term for any timeline, not as in the rest of the Americas to refer exclusively to <33424> and <34324> (rumba clave).

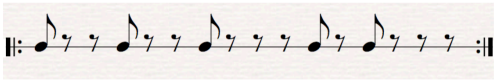
7. Leite's idea to use modified timelines as temporal organizers of jazz arrangements has important antecedents in Brazil, especially in the music of Moacir Santos (e.g., *Coisas* [1965], *The Maestro* [1972], *Saudade* [1974], *Carnival of Spirits* [1975], *Opus 3 Nº1* [1979], and *Moacir Santos: Ouro Negro* [2001]). Leite acknowledges Santos as an important source of inspiration. The interested reader is referred to Andrea Ernest Dias (2010, 173–84) and Alexandre Luís Vicente (2012, 73–92) for a full discussion of Santos's treatment of timelines.

8. American jazz saxophone players Salim Washington and Joshua Redman collaborated with Rumpilezz during their respective visits to Bahia in 2008 and 2012. Clips of their performances may be found at https://www.youtube.com/watch?v=IwBIL_t23bU and http://www.youtube.com/watch?v=lHioa6ut4gs. Both Washington and Redman discussed and praised Leite's compositional method in public interviews (Jackson 2008; TV Cultura 2012).

Timeline Function

Timelines are memorable short asymmetric patterns that temporally organize many grooves and often make them recognizable. One of their functions is to set up a meter: through their persistent repetition, timelines help establish a reference structure that includes an isochronous pulse, a period or time cycle measured in number of beats, and a pattern of pulse subdivision.[9] Depending on context and style, musicians and audiences also identify specific points of reference within the period set up by the timeline. Willie Anku's (2000) term "regulative time point" (RTP) is useful to refer to these points as it implies that these points are perceived and not definitive downbeats within a particular metric framework. For instance, the pattern shown in Figure 2 establishes a time cycle of four beats with quadruple subdivision and a specific RTP, producing the pattern <33424>—although, due to the pattern's asymmetric distribution of inter-onset intervals, the other four onsets may also function as unique RTPs (i.e., <34243>, <42433>, <24334>, and <43342>). And even empty positions within this pattern may function as RTPs. For instance, position 9 of the timeline shown in Figure 2, which corresponds to beat 3, is also a common RTP of this timeline as it will be discussed in "Timeline Orientation." These types of RTP displacements are discussed later in the section "Rotational Possibilities."

Another function that may vary between cultures and genres is providing rules of alignment with the timeline and accent emphasis for the ensemble. But these rules apply differently for improvisation and for arrangement. Generally speaking, rules are followed more deliberately in arrangement and more instinctively in improvised music, or at least,



x	x	x	x	Pulse
x				RTP
1	2	3	4	Time cycle
1 . . .	2 . . .	3 . . .	4 . . .	Pulse subdivision

Figure 2. Son clave and implied reference structure.

9. Meter in musics with timelines does not necessarily involve the hierarchical metric relationships and accentual patterns implied by time signatures in Western music theory (e.g., the metric rules proposed by Lerdahl and Jackendoff [1983]). See Manuel (1985), Pressing (2002), Spiro (2006), Chor (2010) and Toussaint (2015) for a fuller discussion of the differences between Western time signatures and temporal frameworks set up by clave-type timelines. These authors have explained that in many types of musics organized by son clave, <33424>, such as salsa, Afro-Cuban music, and some forms of jazz, metric stress, harmonic changes, and phrase beginnings often occur on beat four rather than on beat one. This results in a perceived displacement of the downbeat for those used to hearing these events on beat one. According to some authors this displacement may have a "psychologically disorienting effect on listeners" (Pressing 2002, 301).

improvisers approach these rules with more relative flexibility. Because I am interested in the relationship between rhetoric about rhythmic complexity and deliberate ways of timeline alignment, this paper focuses on arrangement.

In what follows I briefly discuss the concepts of timeline orientation, stratification, and rotation using two well-known timelines: son clave, <33424>, and the so-called West African standard pattern, <2212221>.

Timeline Orientation

During the 1940s, various Cuban writers and arrangers contributed to formalizing the principle of clave orientation whereby the clave cycle is divided into two halves with contrasting feels: one half is more syncopated than the other, creating a sense of tension and release.[10] Some authors have characterized the complementary character of these two sides as a relationship of antecedence–consequence or strength–weakness (Grenet 1939, xv), call and response (Spiro 2006, 28–33), and tension–release or syncopated–straight opposition (Stover 2009, 153). The two orientations are called 3-2 and 2-3 in reference to the number of onsets on each side (see Figure 3), with both being equally plausible and common in most Afro-Caribbean music or salsa, but less so in Afro-Brazilian and West African music, where the 3-2 orientation is more common.

Each orientation may be established through the consistent assertion of a RTP on (or slightly before) the beginning of one clave side with harmonic changes, patterns of phrase beginning, or patterns of accentuation. When phrasing in an arrangement consistently reinforces the established orientation, it is characterized as being "in clave" and otherwise as "crossed with clave" or "clashing with clave." Although there is no consensus among musicians and writers on how patterns should *exactly* align with clave in order to be considered "in clave," some authors have proposed guidelines or rules of thumb. Christopher

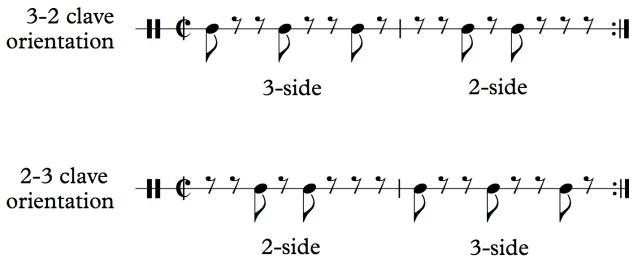


Figure 3. Two clave orientations.

10. New York-based Cuban arranger Mario Bauzá was one of the first musicians who consciously and systematically used principles of clave orientation in his arrangements (e.g., "Tanga," 1947). His clave-based arrangements became a structural foundation of Afro-Cuban jazz in the 1940s. Other important musicians from the same era who embraced and reinforced Bauza's clave principles in Afro-Cuban jazz included Dizzy Gillespie, Charlie Parker, Machito, and Chano Pozo.

Washburne (1997, 66–67), for instance, has written that a pattern is "in clave" when key accented notes align with clave onsets and when the music alternates two-beat phrases of relatively different levels of syncopation: the relatively more syncopated half matches the 3-side of clave and the other half aligns with the 2-side. However, rules of timeline alignment and orientation apply with varying degrees of flexibility.[11] For instance, a melody may occasionally "clash" with one side of the timeline and resolve on the other, as happens in bars 14 and 15 of Figure 4. The examples in Figures 4 and 5 respectively illustrate alignment to 3-2 and 2-3 clave orientations.

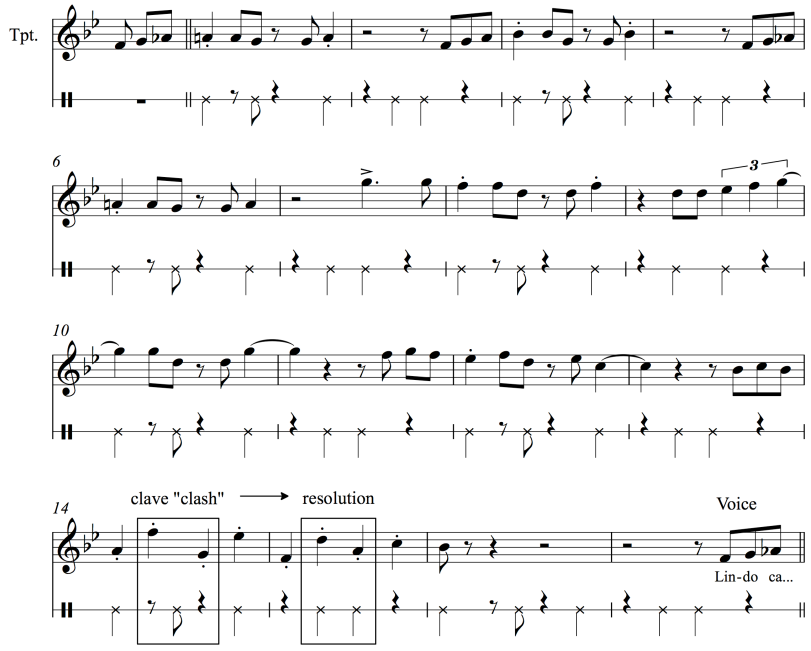


Figure 4. 3-2 clave orientation in "Capullito de Alheli." Transcription from Los Naranjos (1998), track 1, 0:04–0:28.

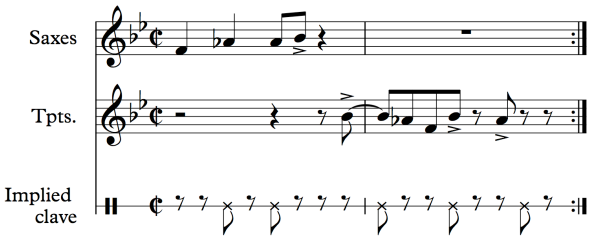


Figure 5. 2-3 clave orientation in "Manteca."[12] Reduction from Gillespie et al. (2011), mm. 29–32.

11. See Stover (2009) for a fuller discussion of clave pendularity in Afro-Cuban music and salsa (when the perception of the RTP shifts from the 2-side to the 3-side of clave or vice versa); and Washburne (1997, 66–67) for a proposed set of guidelines of clave alignment applied to early American jazz that includes building tension by clashing momentarily with clave and *resolving* the rhythmic tension at a later point.
12. Although many attacks in this melody do not coincide with clave strokes, the melody can be said to be in 2-3

This principle of orientation over a four-beat cycle may apply even when timelines are silent. In such cases, timeline feels are implied by the various instrumental parts of the ensemble: ostinati and melodic lines. The principle is so prevalent in some genres, that it may occur even when a shorter timeline is heard. Julian Gerstin (2017, 30–33), for instance, documents cases in Ghana (the Ewe's *kinka* dance) and Cuba (*gaga*) where singing or drumming parts are oriented *as if* following clave (that is, alternating syncopated and on-the-beat feels every two beats) while a *tresillo*, <332>, is played by the bell, a phenomenon that he refers to as paired two-beat timelines with implied orientation. Similar examples may be found in various Afro-Bahian styles, including *capoeira*, *samba de roda*, and some Candomblé grooves. However, implied orientation in paired two-beat timelines is not the rule. Gerstin (2017, 33) also documented cases in Martinique's *bèlè* tradition where a sounding *cinquillo*, <21212>, is "apparently paired in songs, but where any sense of orientation is constantly broken by dancing and drumming." For him, these non-oriented examples reflect a different rhythmic sensibility than in Ghana or Cuba, two musical cultures that he feels are overrepresented in studies of timelines in Africa and the African diaspora (ibid., 1). Broadly speaking, this paper elaborates upon Gerstin's argument by documenting noncanonical cases of timeline alignment in Brazil.

Stratification

Timelines unfolding over a cycle of twelve subdivisions, such as the standard pattern, are singular as they offer various isochronous organizational possibilities: they can be divided by 6, 4, and 3. That is, they can fit 6/4, 12/8, and 3/2 time signatures, as Figure 6 demonstrates.

Although the 12/8 time signature best reflects how dancers feel the music, in many West African and diasporic musical traditions, seasoned performers hear the cycle simultaneously from metric perspectives that subdivide it into 3, 4, or 6. Chris Stover (2009, 153) explains that this allows them to exploit "the relative metric weight of each [metrical framework], and the possibilities inherent in each for the creation of tension and release, to create rhythmic drama and give a certain balance to a performance." In fact, the cross-rhythms produced by these kinds of superimpositions of metric interpretations have been acknowledged by generations

clave orientation for two reasons. First, when the melody is divided into two halves, the first half is less syncopated than the second half. It follows that the first half (the comparatively less syncopated one) should be aligned with the 2-side of clave. And second, the accented B♭ on the fourth eighth note of the second bar strongly suggests that the second half of the melody should align with the 3-side, because the clave places only one stroke in an offbeat position, and the accented articulation of that position is thus a clear identifier of clave's 3-side. Julian Gerstin supports this idea in his description of the two sides of clave (he prefers the terms "3-3-2 side" and "straight side" instead of 3-side and 2-side). For him, the more syncopated 3-3-2 side is characterized by "the anticipatory sixteenth note [eighth notes in notation *alla breve* as in Figure 5] before beat 2" (Gerstin 2017, 25–26, my addition). This contrasts with the straight side (the 2-side of clave), which "includes beat 3, beat 4, or both, along with one or two offbeat eighth notes [quarter notes in notation *alla breve*], but no offbeat sixteenth notes [eighth notes in notation *alla breve*]" (26). Of course, clave's 2-side may contain accented notes in eighth-note offbeat positions too, but usually less so than the 3-side. What is important is that the 3-side feels *relatively* more syncopated than the 2-side.

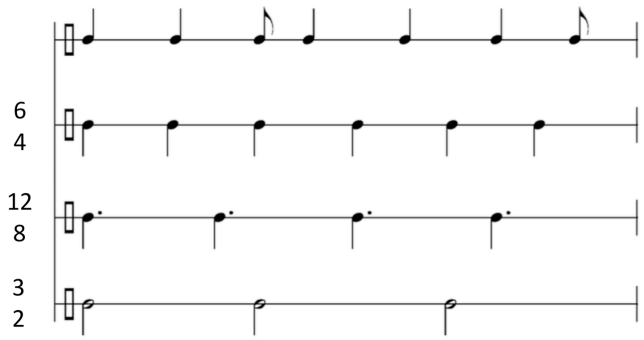


Figure 6. Standard pattern superimposed with three pulse streams. After Stover (2009, 130), adapted by the author.

of scholars who have considered them a fundamental characteristic of West African and African diasporic music. This has been a key factor in supporting a discourse of African rhythmic complexity.[13]

Examining how our perception of the standard pattern may be affected by a stratified reading, Stover writes, "the stratified perspective reinforces our perception of the first event shown as a strong, accented downbeat based on the number of simultaneities between strata [beat streams] that occur there: all three strata line up on beat one" (130). Three further points where our perception is potentially reinforced occur at points of coincidence between the pattern and some of the strata: in referential time point 3 (position 3 hereafter), the 6/4 strata and the pattern align; in position 5 the pattern, the 6/4, and the 3/2 strata coincide; and in position 10 the pattern and the 12/8 strata share a simultaneity. As will be discussed, the latter is a point that draws and demands strong attention as it resolves accumulated rhythmic tension.

Rotational Possibilities

Pattern rotation occurs when the position of the RTP is shifted in time over a fixed set of durations. For instance, the standard pattern with the inter-onset pattern <2212221> may be organized beginning from any of its seven onsets (see Figure 7), or even from each of its five empty positions.

The rotational possibilities of the standard pattern have been explored by Anku (2000) and Agawu (2006) in the context of drumming and dance ensembles from Ghana and Nigeria. Both authors concluded that although the rotations shown in Figure 7 are clearly related to each other at a structural level, each involves a shift in the relative gestalt of the pattern, and in some cases, new metric interpretations (Agawu 2006, 29; Anku 2000, par. 16).

13. The interested reader is referred to Appendix 4 of Eugene Novotney's (1998, 277–97) DMA dissertation, where he reviews the trajectory of the concept of cross-rhythm in Anglophone scholarship of African music from 1927 to 1995.

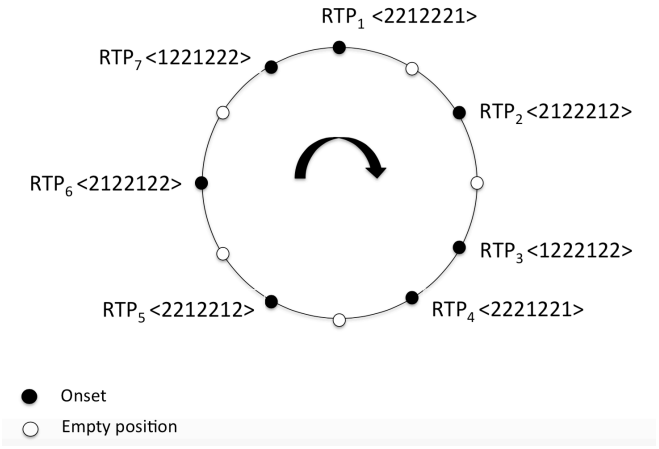


Figure 7. Circular representation of the standard pattern and seven possible RTPs.

There are various ways of studying the perceived differences between the various rotations. One, explored by Agawu (2006, 29), is counting the number of non-simultaneities between rotations. By this count, rotation 1 is close to rotations 4 and 5, as they only differ by one permutated element. And rotations 2, 6, 3, and 7 increasingly depart from rotation 1 as they respectively differ by 2, 3, 4, and 5 non-simultaneities (see shaded squares in Figure 8). In sum, the distance between two rotations can be measured in terms of timeline misalignment.

	1			**2**			**3**			**4**			non-simultaneities
Rotation 1	x		x		x	x		x		x		x	
Rotation 2	x		x	x		x		x		x	x		2
Rotation 3	x	x		x		x		x	x		x		4
Rotation 4	x		x		x		x	x		x		x	1
Rotation 5	x		x		x	x		x		x	x		1
Rotation 6	x		x	x		x		x	x		x		3
Rotation 7	x	x		x		x	x		x		x		5

Figure 8. Seven rotations of the standard pattern notated in TUBS[14] showing the number of non-simultaneities with rotation 1.

14. The Time Unit Box System (TUBS) is a notational system mostly used for periodic rhythms. It consists of a row of boxes, each representing a minimal subdivision of the time cycle. The onsets of the rhythm to be notated are filled and the rest are left blank. Although versions of this system have probably been used for centuries by musicians, teachers, and writers around the world, TUBS began to be used more systematically in ethnomusicology in the 1970s when James Koetting (1970) adapted it for the notation of polyrhythmic music in West Africa. Koetting (1970, 117) acknowledges the work of Phillip Harland and Kwabena Nketia as important precedents of TUBS.

Another criterion may be focusing on metric strength, that is, examining how the events of each rotation align with metric beats. Stover (2009, 141) uses waves of metric strength (he calls them waves of rhythmic consonance and dissonance) to represent the alignment of the events of the standard pattern with two beat streams: one associated with 12/8 and another one with a 3/2 time signature.[15]

The shapes in Figure 9 are wide when metric beats corresponding to a particular metric reading are matched by a rhythmic onset and narrow otherwise. A horizontal line joining two on-beat positions represents a sustained rhythmic consonance and a sloped curved line represents a transition between consonance and dissonance or vice versa.

In Figure 10, I have created shapes for the remaining six rotations of the standard pattern to study metric perception and to illustrate the stratified readings that performers and listeners are expected to engage in. Predictably, the shapes confirm that rotation 1 is closer to rotations producing more shared simultaneities—rotations 4 and 5. But they also tell us that certain permutations may have a stronger impact than others on beat perception, depending on which reading one is attending to—swapping the element from position 6 to 7 in rotation 4, for instance, has a stronger effect in the 12/8 reading than swapping the element from position

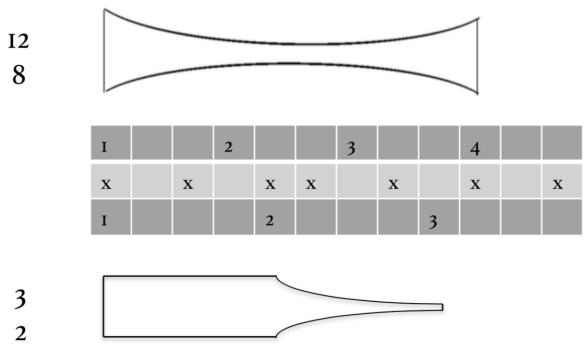


Figure 9. Waves of metric strength for the standard pattern. After Stover (2009, 141), adapted by the author.

15. Godfried Toussaint (2010, 10) discusses a similar procedure to measure metrical dissonance (he also uses the term *gestalt despatialization*) in the five rotations of son clave, <33424>. He claims that "in the case of 16-pulse timelines, which necessarily have four strong fundamental four-pulse beats felt at pulses 0, 4, 8, and 12, a gestalt despatialization can be introduced by first misguiding the listener into perceiving and cognitively predicting a sequence of three-pulse duration intervals." This leads him to conclude that rotation <33424> yields the most *successful/popular* timeline—in his words "not so complex that it becomes difficult to grasp by the masses, and . . . not so simple that it quickly becomes boring" (3)—as it produces metrical dissonance in the first half (clave's 3-side) and resolves it in beat four (in the second stroke of 2-side). One could compare Toussaint's idea of gestalt despatialization in son clave due to the emergence of a competing pulse with the coexistence of metric readings in the standard pattern. According to Toussaint's criteria, rotations 1, <2212221>, and 5, <2212212>, are the two more *successful* ones of the standard pattern as they are the only ones producing metrical dissonance in the first half of the pattern (a 3 against 2 cross-rhythm) and *resolving* on beat four. Notice that rotation 4, <2221221>, also begins with a 3-against-2 cross-rhythm but articulates beat 3, thus "resolving" earlier and interrupting the rhythmic tension which Toussaint believes should be maintained until beat four to make it more successful.

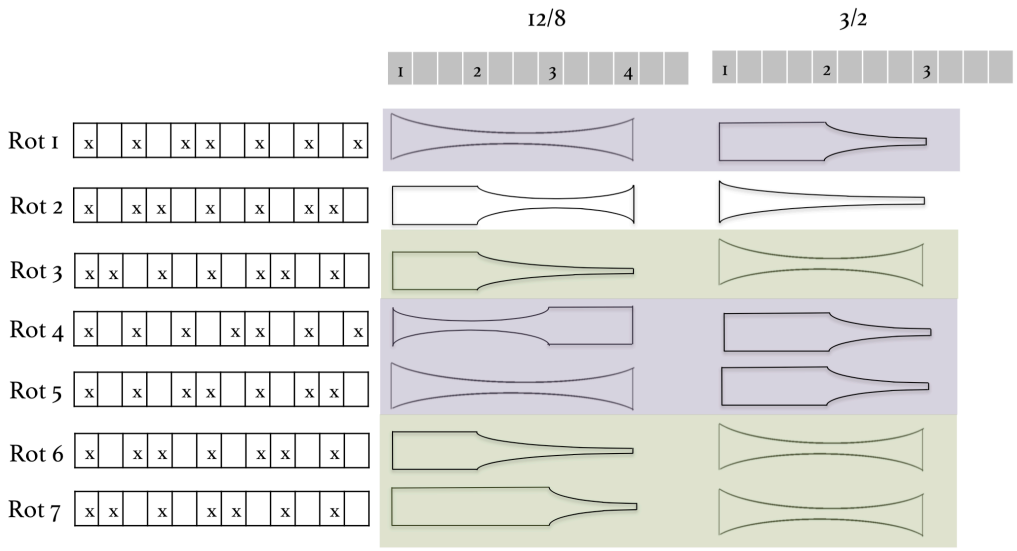


Figure 10. Waves of metric strength for seven rotations of the standard pattern (12/8 and 3/2 metric readings). The colors represent two wave families.

12 to 11, as it increases metric strength by articulating an extra metric beat. Based on this logic, one could conclude that rotation 1 is closer to rotation 5 than to rotation 4 and this is reflected in the identical shapes of rotations 1 and 5 for both metric readings.

The shapes also help to determine which rotations are metrically more *distant* from rotation 1. Rotations 3, 6, and 7 in Figure 10 may be classified as the most contrasting as they avoid the articulation of beat four in the 12/8 reading, a defining feature of rotation 1. And they also swap dissonance for consonance on the third beat of the 3/2 reading.

Based on similarities and differences of metric strength in relation to rotation 1, I have grouped the rotations in two family groups, shown in green (contrasting) and purple (close) in Figure 10. Rotation 2 may be classified in either group as it shares characteristics with both. The assumption is that listeners familiar with rotations 1, 4, and 5 (the most commonly found in black Atlantic grooves in compound meter[16]) would perceive pieces organized around rotations of the contrasting family (3, 6, and 7) as more complex because the metric frameworks of the familiar and actual timelines can potentially compete with each other, creating ambiguity or perceptual rivalry.

TIMELINES IN BRAZILIAN SCHOLARSHIP

The timeline's functions of setting up (or reinforcing) meter and providing a framework

16. Rotation 1 of the standard pattern, <2212221>, is ubiquitous in drumming ensembles from West Africa, the Caribbean, and Brazil. Rotation 4, <2221221>, is a common variation of *vassi* used in Candomblé houses in Brazil (Cardoso 2006), and rotation 5, <2212212>, is typically used in various genres of the Nigerian Yoruba (Anku 1997).

for accentual emphasis are widely acknowledged by scholars of Afro-Brazilian musics and often invoked to assert connections with Africa.[17] Gerhard Kubik (1979) was one of the first scholars to describe the so-called timeline patterns of African origin. For him, timelines survived in Brazil (and in other places of the African diaspora), and their presence has a *diagnostic* function when analyzing the African musical heritage in Brazil. Tiago de Oliveira Pinto (1999–2001, 95–96) points out that in Afro-Brazilian music, timelines "function as orientation for other parts of the music in their temporal dimension" and confirm "the Bantu origins of samba or the Yoruba and/or Fon origins of gege/nagô Candomblé."

Although the 2-3 / 3-2 clave orientation construct is marginal in the lexicon of musicians, arrangers, and scholars of Afro-Brazilian genres, analogous rules of orientation apply when the music is organized around a four-beat timeline. I observed how my percussion teachers in Bahia[18] began and emphasized either side of the ijexá pattern (<122122222> or <222212212>) when they played the pattern unaccompanied, but consistently emphasized a specific beginning when playing along with a song or with an extended drum variation. For instance, they and all Candomblé singers I have heard in Salvador always align the song "Oromima" with the ijexá pattern as shown in Figure 11.[19]

Brazilian scholars also recognize the rotational possibilities of timelines. Oliveira Pinto (1999–2001, 96–97), for instance, established a relationship between the Angolan *kachacha* timeline, <222212221>, and a common samba timeline, <221222212> (see Figure 12). For Oliveira Pinto, the basic set of durations of kachacha was maintained in Brazil, but resignified with a new downbeat placement in its new musical context (97). He concludes that the samba rotation does not affect the essence of kachacha, as it retains two key characteristics: its set of durations and its function as temporal organizer of the ensemble.

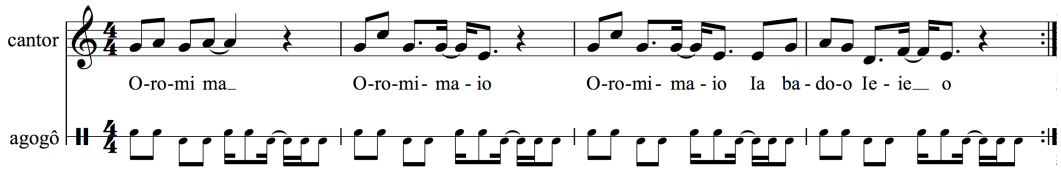


Figure 11. Candomblé song "Oromima" aligned with ijexá orientation <222212212> (source: Gabi Guedes, Salvador, April 2012).

17. Brazilian scholars have translated timeline as *padrão rítmico* (Sandroni 1996), *linha guia* (Sandroni 2001; Fonseca 2006), and *ritmo guia* (e.g., Oliveira Pinto 1999–2001; Lopes Carvalho 2011), with some preferring to maintain the English word timeline (e.g., Lühning 1989; Cardoso 2006; Nobre 2008). Some scholars have tried to clarify the terminology by reserving "timeline" for Africa, "clave" for Afro-Cuban music, and "ritmo guia" (or "linha guia") for the Afro-Brazilian case (Lopes Carvalho 2011, 91).

18. I took carnival and Candomblé percussion lessons in Salvador in 2009 and 2012 with Renato Kalile, Ricardo Costa, Marivaldo Pereira de Brito (also known as Macambira), and Gabi Guedes, all active in traditional Candomblé worship houses and in popular musical settings.

19. Many Bahian popular musicians have adapted the ijexá timeline and adhered to the orientation <122122222>. Listen for instance, to Caetano Veloso's "Badauê" (*Cinema Transcendental,* 1979) and Gilberto Gil's "Patuscada de Ghandi" (*Refavela,* 1977) and "De Ouro e Marfim" (*Quanta,* 1997).

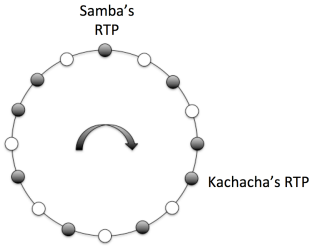


Figure 12. Oliveira Pinto's circular representation of kachacha and samba timelines. After Oliveira Pinto (1999–2001, 97), adapted by the author.

In their dissertations, Adriana Ernest Dias (2010) and Alexandre Luís Vicente (2012) discuss the use of non-conventional timelines by Bahian jazz musician Moacir Santos. According to Vicente (2012, 73–90), Santos developed a timeline prototype that he called *mojo*, <222122122>, and applied procedures of expansion or truncation to fit various metric configurations (3/4, 4/4, 5/4, 6/4). Vicente (2012, 92) also conceptualizes the timelines of various Santos compositions as rotations of Candomblé or carnival timelines (see Figure 13). As will become evident, Santos's treatment of timelines represents an important precedent to Leite's project, specifically in techniques involving timeline rotation, expansion, and truncation.

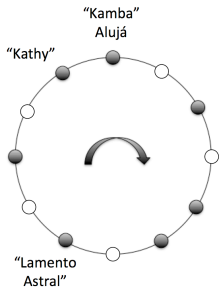


Figure 13. Vicente's circular representation of Moacir Santos's "Kamba," "Lamento Astral," and "Kathy" (Nogueira and Adnet 2001) in relation to *alujá* (a Candomblé timeline). After Vicente (2012, 92), adapted by the author.

Analysis

The focus now shifts to Orkestra Rumpilezz's treatment of timelines. I consider techniques of rotating, truncating, and expanding traditional timelines found in Afro-sacred music from Bahia, and cases of non-conventional timeline alignment.

Rotation of Vassi in "Honra ao Rei"

The standard pattern, <2212221>, is a common timeline found in the drumming ensembles of most Afro-Brazilian sacred traditions (Candomblé, Umbanda, Tambor de Mina, Xangô, Macumba, etc.). In Yoruba-derived Nagô Candomblé cults, it is known as *vassi* and it

underlies grooves associated with at least five deities: Ogum, Xangô, Yemanjá, Iansá, and Oxalá.[20] In Bahia, vassi is a strong symbolizer of Afro-Brazilian religion, as it is rarely found outside of these contexts.

Of the eighteen pieces recorded by Rumpilezz across two albums, Leite bases three directly on vassi: "A Grande Mãe," "Balendoah," and "Mestre Bimba Visita o Palácio de Ogum"; rotates vassi to form new timelines for "Honra ao Rei" and "Dasarábias"; and cuts one beat of vassi to form the timeline of "Anunciação," "Adupe Fafá," and "Banzo pt. 2." The high incidence of vassi in Rumpilezz's repertoire is aligned with the orchestra's stated goal to showcase Afro-Bahian culture. Because Candomblé is arguably the strongest marker of Africanness in Brazil (Carvalho 1993; Sansone 2004), a connection with Candomblé music through the use of vassi is strategic. It is also important to note that in Bahia triplet beat subdivision commonly signifies Afro-sacred music.[21] While Leite's arrangements that rotate or cut one full beat of vassi may obscure the identity of this timeline, they retain the triplet subdivision feel and the potential to be associated with Candomblé music.

As shown in Figure 14, Leite uses rotation 2 of vassi, <2122212>, as the timeline of "Honra ao Rei," a rotation sharing characteristics of the two families of rotations presented in Figure 10: In the 12/8 reading it articulates beat two like rotations 3, 6, and 7, and beat four like rotations 1, 4, and 5. A distinct characteristic of vassi in its conventional rotation (i.e., rotation 1) is that the two articulated beats (one and four) in the 12/8 reading are maximally separated

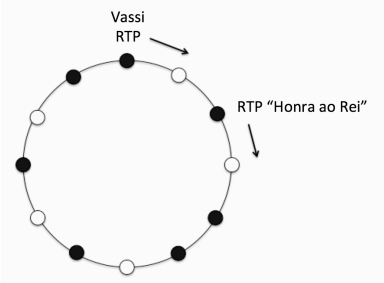


Figure 14. Timeline of "Honra ao Rei" represented as a rotation of vassi.[22]

20. Vassi may be played with distinct tempi and microrhythmic feels in each of these grooves (Cardoso 2006, 66, 68). This study does not consider these differences.
21. Most traditional and popular genres in Bahia have duple or quadruple beat subdivision—*capoeira*, all forms of samba, carnival music, *pagode, axé* music, and more. However, triple subdivision may appear in breaks or improvisations in most of these genres. In capoeira, for instance, it is common that lead singers and *berimbau* players superimpose phrases in triple beat subdivision over a groove in simple meter (e.g., Grupo de Capoeira Angola Pelourinho 1996). The only non-religious traditional genre in Bahia that is exclusively in compound meter is *jongo*. There are also examples of songs by Bahian popular musicians entirely or partly in compound meter, but in most cases with direct references to Candomblé; for instance, Carlinhos Brown's "Kissangá," "Ódemã," and "Coiacoia" (*Candombless* 2005). Various carnival groups in Salvador like Olodum (Henry 2008, 138–39) or Da Cor (Diaz 2014, 11) also experiment with grooves in triple subdivision, again with direct references to Candomblé.
22. A performance of "Honra ao Rei" can be seen at https://www.youtube.com/watch?v=0ePwjxMN5Ps (SESC Pompeia, Jazz na Fabrica, São Paulo, 2016).

with the onset in beat four (position 10) instilling a sense of resolution. This point is felt as an early arrival before the pattern cycles again into itself. This sense of resolution in position 10 is enhanced as the pattern begins articulating metric beats of the 3/2 and 6/4 readings (positions 3 and 5), which compete with the 12/8 reading, adding rhythmic tension. The only other rotation producing this effect is rotation 5. With onsets on beats one, two, and four of the 12/8 reading, and without strokes reinforcing a 3/2 or 6/4 reading in the first half of the pattern, the onset in position 10 of rotation 2 creates a weak sense of resolution and makes the feel of this rotation highly contrastive in relation to rotation 1.

Various Rumpilezz fans in Salvador described the rhythm of "Honra ao Rei" as "complicated" or "difficult" (Jazz no MAM, Salvador, July 2016). After a period of focused listening, one listener identified the original timeline (i.e., rotation 1) embedded in the time cycle of this piece and reinterpreted the meter shifting the RTP to position 11. By doing this rearrangement, he could hear the piece *as if* it were organized by his familiar timeline, but this interpretation clashes with the metric framework reinforced by the rest of the ensemble. This may be why listeners perceive this piece as complex: there is ambiguity between (at least) two contrasting interpretations of the timeline.

Rotation of Vassi in "Dasarábias"

Leite formed the timeline of "Dasarábias" with rotation 3 of vassi, <1222122>, represented in Figure 15, which belongs to a wave family contrasting the most with vassi (shown in green in Figure 10). Judging from metric and timeline strength, the perceived rhythmic complexity in "Dasarábias" may be greater than that reported for "Honra ao Rei." Rotation 3 has higher timeline misalignment (four non-simultaneities) than rotation 2 (two non-simultaneities) in relation to vassi. And more importantly, rotation 3 articulates beats one and two but misses beat four, which is characteristic of vassi in its conventional rotation. Towards the end of this paper I discuss a passage of this piece that is made more complex with the use of rotation 3 and other rotations.

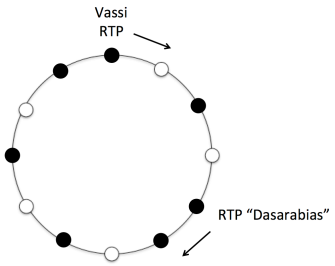


Figure 15. Timeline of "Dasarábias" represented as a rotation of vassi.[23]

23. A performance of "Dasarábias" can be seen at https://www.youtube.com/watch?v=Ddk76jy_aOA (Anchieta Theater of SESC Consolação São Paulo, 2013).

Truncating Timelines in "Anunciação"

Leite truncates the vassi timeline in "Anunciação" by eliminating the last beat of the 12/8 measure, producing an odd compound meter (9/8) that is foreign to traditional and most popular music in Bahia—and for that matter in all Brazil (Figure 16). In this sense, this procedure constitutes an objective step towards increasing rhythmic complexity of the orchestra's musical sources.

The structure of this pattern is peculiar as the elements of the cut beat coincide with those of the first beat. A listener familiar with vassi is likely to hear the first beat of the new timeline as the fourth beat of a complete vassi and thus to project a new beginning at beat 2 of the new timeline as shown in Figure 17. The dotted line represents an unrealized four-beat projection (per Hasty 1997).[24] The listener's projection of a complete vassi timeline unfolds through the experience of hearing it (from the very first seven onsets). Alternatively, the first presentation of the "Anunciação" timeline could be heard as an elision rather than a truncation of vassi—the last two vassi events (i.e. the first two "Anunciação" timeline onsets of the second pattern iteration) are not gone; they are potentially heard doubly as the end of one vassi iteration and the beginning of the next.

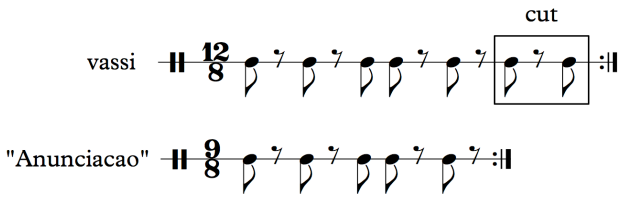


Figure 16. Relationship between vassi and "Anunciação" timeline.[25]

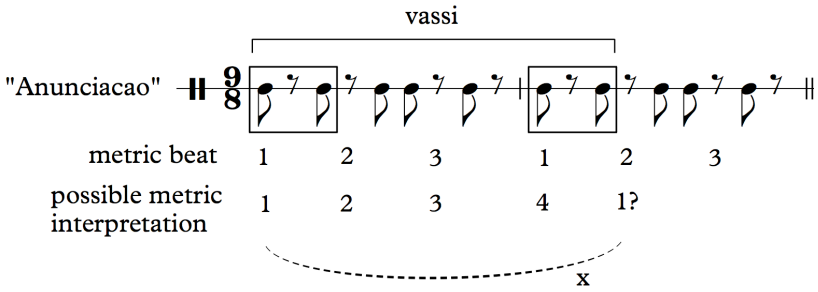


Figure 17. Two metric interpretations of "Anunciação" timeline.

24. Christopher Hasty's (1997) theory of projection is a processual approach to meter designed to predict the intuitions of listeners. Although the theory was not specifically proposed for Afro-Bahian repertoires, it is useful to illustrate how a listener may recognize a familiar pattern (say *vassi* in Figure 17 or *ijexá* in Figure 20) and project a repetition of it that may or may not materialize.

25. See performance of "Anunciação" at https://www.youtube.com/watch?v=YBe9NCG7loU (Anchieta Theater of SESC Consolação, São Paulo, 2013).

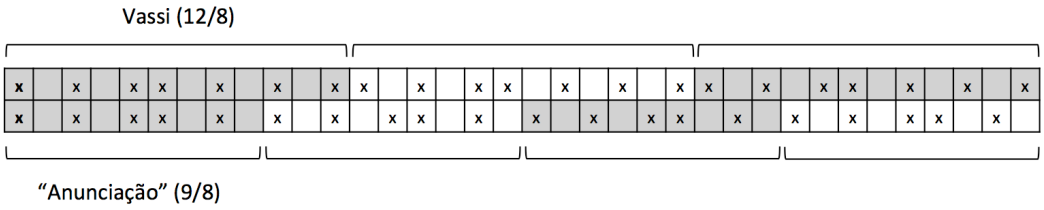


Figure 18. Vassi and "Anunciação" timeline superimposed over a cycle of 36 subdivisions.

The tendency to superimpose a full vassi timeline over "Anunciação" was confirmed in a conversation with an Ewe master drummer in Accra (Wisdom, p.c. in Accra, 17 March 2016). Upon listening to a recording of the piece he was able to identify the metric pulse and when I tapped the timeline, he entrained it immediately. After a pause I replayed the recording and asked him again to tap the timeline. This time he tapped the entire vassi pattern against the three-beat timeline of "Anunciação" and emphasized the moments where the beginning of both patterns aligned with a hand gesture and a dynamic accent. That is, he identified a cycle of 36 subdivisions, at the beginning of which a complete vassi pattern matches the onsets of the "Anunciação" timeline (see Figure 18). In this case, strong familiarity with the standard pattern triggered an alternative interpretation of the timeline of "Anunciação," creating ambiguity and increasing its perceived metric complexity.

Truncating Timelines in "Feira de Sete Portas"

Leite also cuts the *ijexá* bell pattern, one of the most popular patterns in Bahian music. Clarence Henry (2008) wrote that ijexá, and the groove associated with it, is located at the crossroads of the sacred and secular in Bahia as it may be found in Candomblé and Umbanda ceremonies, carnival music, and many popular songs. In Candomblé, ijexá is associated with *orixá* Oxala, the father of all *orixás* in Yoruba mythology, and mainly with Oxum, the Yoruba goddess of beauty and fresh water. This religious association prevails in secular contexts, and it helps the pattern to function as a marker of blackness, Africanness, and sometimes, Bahianness.

In contrast to the cycle of twelve subdivisions of vassi, the ijexá's cycle spans sixteen subdivisions. In this sense, ijexá is more related to timelines of the clave family. In carnival *afoxé* ensembles[26] the pattern may be said to follow the binary principle of clave orientation, as it may appear with two possible RTPs separated by eight subdivisions: <1221222222> or <2222122212>. As explained above, this does not imply that music based on ijexá is structurally fluid in the same way that much Afro-Cuban music is or that the entire 3-2 / 2-3 Afro-Cuban construct can be applied to ijexá-based music, but that like in the clave family, ijexá music

26. *Afoxés* are carnival ensembles from Bahia that use Candomblé instruments (*atabaques*, *agogôs*, and *xequerês* or gourds covered with beads) and focus on the ijexá Candomblé groove. Like *blocos afro*, they are tightly linked to movements of black consciousness in Bahia. Although Filhos de Ghandy, the first recognized afoxé group, was founded in 1949, practitioners claim to be connected with a Bahian tradition going back more than a century.

usually emphasizes one of two possible beginnings.

In "Feira de Sete Portas" Leite cuts the last two subdivisions of ijexá in the orientation shown in Figure 19. This cuts half a beat from the end of the cycle and produces a cycle of fourteen subdivisions, resulting in a highly idiosyncratic 7/8 meter. The resulting timeline retains eight out of ijexá's nine onsets but cycles back to its beginning a half beat earlier than those familiar with ijexá would expect. The close resemblance of the two timelines may compel the listener to superimpose the familiar four-beat feel of ijexá over the cut timeline. The challenge of this reading (metric interpretation 2 in Figure 20) is that the projected beginning falls in the first counter beat of the second measure shown in Figure 20 and sets up a contrametric beat every other measure. An alternative found by the performers of Rumpilezz and various listeners I observed during their performances is to count three long beats and one short, as shown in metric interpretation 1 of Figure 20.

On stage Leite engages the audience by clapping a complementary pattern as shown in Figure 21. This pattern is formed by articulating three timeline onsets (positions 4, 11, and 13 of the time cycle), with one additional clap placed in an empty timeline position (position 8). I observed that most members of the audience struggled to reproduce the pattern, partly because of its odd meter, partly because of the syncopated attack in position 8, and partly because Leite deliberately omits the downbeat. With this exercise Leite reinforces the orchestra's rhetoric of rhythmic complexity in a more tangible way—i.e., not only perceptually, but also experientially.

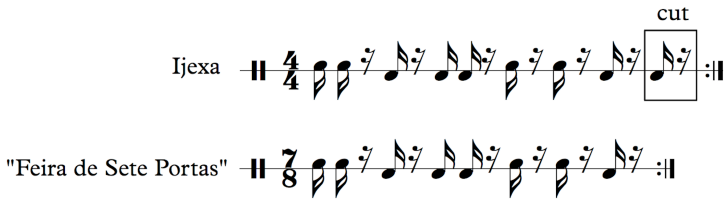


Figure 19. Relationship between ijexá and the "Feira de Sete Portas" timeline.[27]

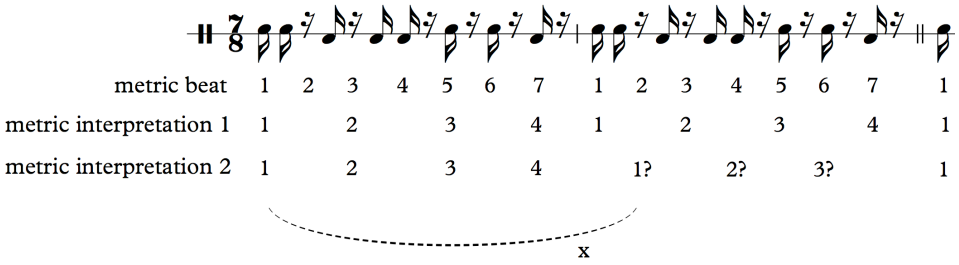


Figure 20. Three metric interpretations of "Feira de Sete Portas" timeline.

27. See performance of "Feira de Sete Portas" at https://www.youtube.com/watch?v=8607SIlYxNY (Festival Bahia de Som Salvador, Ibirapuera Auditorium, São Paulo, 2012).

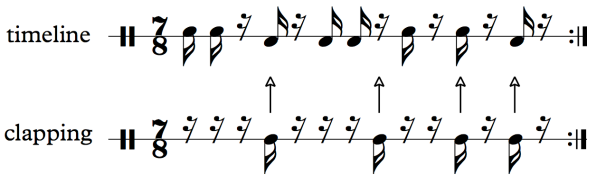


Figure 21. Timeline and clapping pattern in "Feira de Sete Portas." See Leite engaging the audience with this clapping pattern in https://www.youtube.com/watch?v=8607SilYxNY.

Expanding Timelines in "Banzo Pt. 1"

Another technique used by Leite to modify traditional timelines is expansion. "Banzo Pt. 1" is inspired by *aguere*, a Nagô Candomblé groove for orixá Oxossi, a Yoruba deity governing hunting and the forest. The aguere timeline, <13112>, spans eight minimal subdivisions grouped in two beats or halves. In "Banzo Pt. 1" Leite adds two minimal durations to aguere, forming a pattern of ten subdivisions, <14122> (See Figure 22). In order to make clear to Candomblé audiences the relationship of this pattern to aguere, he inserts two short fragments of the original aguere timeline in the arrangement, each spanning three bell cycles (1:33–1:38 and 2:18–2:23).

One interpretation of the "Banzo Pt. 1" timeline is to group its ten subdivisions in two halves of five each: <14> and <122>. This makes it possible to compare it to aguere, which is clearly segmented in two halves of four subdivisions each: <13> and <112>. When heard this way, the new pattern models the distribution of events heard in aguere—both have two clusters of two and three notes commencing at the beginning of each half of the pattern. The only difference (in addition to the inclusion of one silent duration in each half as shown in Figure 22) is that the three notes that comprise the second cluster are not strictly contiguous as in aguere.

However, this interpretation of the timeline of "Banzo Pt. 1" is importantly challenged by the fact that the pattern also reinforces an isochronous five-beat cycle, particularly through its last two onsets in positions 7 and 9. Furthermore, the low-pitched onset in position 7 (the only one with that distinct pitch) is a point of strong metric attention that undermines the

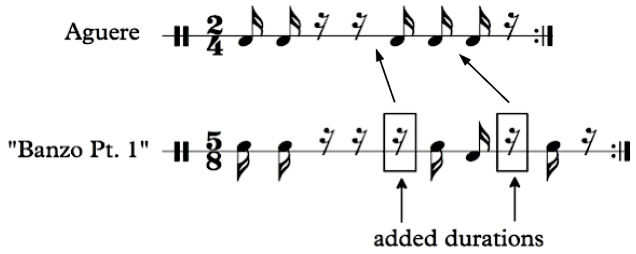


Figure 22. Relationship between aguere and timeline of "Banzo Pt. 1."

position 6 event's potential as a group beginning. Put differently, the low-pitched stroke in position 7 makes it difficult to feel the pattern as divided in two halves and instead suggests an asymmetric subdivision of six plus four minimal subdivisions (or three plus two beats), marked in Figure 23.

An asymmetric grouping of the timeline of "Banzo Pt. 1" opens the possibility to compare the pattern to a slightly different version of aguere that is commonly heard in Candomblé ceremonies, <1322>. In this interpretation, the "Banzo Pt. 1" timeline is obtained by adding two durations (one silent, one articulated) in positions 5 and 6, as shown in Figure 24. These two durations prolong the first half of aguere and the added onset in position 6 functions as a pick up of the second part of the pattern, which clearly begins with the low-pitched stroke in position 7. In sum, the timeline of "Banzo Pt. 1" can be interpreted as an expansion of two versions of aguere. One maintains aguere's symmetric grouping and the other suggests an asymmetric one. These two interpretations can potentially create ambiguity and increase the perceived rhythmic complexity of this piece.

It is important to notice that Leite's transformation of aguere, despite running over an odd time cycle, exhibits characteristics that make it comparable to clave and the standard pattern. When segmented into two sections of three and two beats, the former contains more rhythmic tension or syncopation than the latter, as shown in the wave in Figure 25. This results in a relationship of tension and release between the two sections similar to the relationship between the 3-side and 2-side of clave. Beat 4 provides a strong sense resolution that is prolonged by beat 5 (see Figure 25).

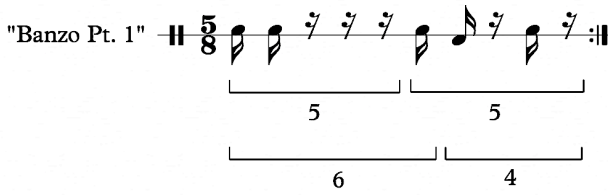


Figure 23. Two grouping structures of timeline of "Banzo Pt. 1."

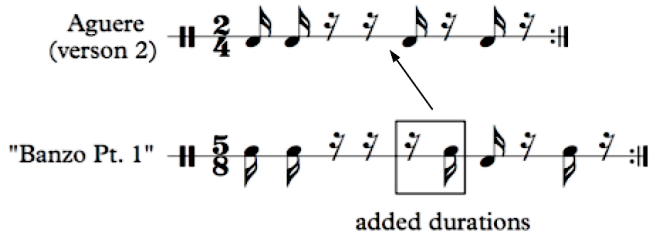


Figure 24. Relationship between aguere (version 2) and timeline of "Banzo Pt. 1."

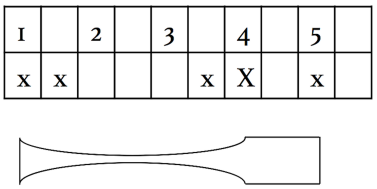


Figure 25. Wave of metric strength of "Banzo Pt. 1" timeline.

Elsewhere I have explained that neither aguere bell pattern variation is sufficiently long and distinctive to provide the sense of tension and release characteristic of the timelines discussed thus far (Diaz 2014, 198–99). Thus, by expanding aguere, Leite has achieved a timeline that provides a sense of tension and release but with an odd meter that is foreign to Candomblé, Afro-Brazilian traditional music and most Brazilian popular music. Between its odd meter and potential for dual metric interpretations, "Banzo, Pt. 1" is very likely to be perceived as more rhythmically complex than its source (aguere) by local listeners.

Rotated Timeline Alignment in "Floresta Azul"

Now I turn to timeline alignment in Rumpilezz's repertoire. "Floresta Azul" is also inspired by aguere. Likely aware of the limitations of the aguere bell pattern to function as timeline, Leite introduces a four-beat timeline identical to son clave, but that may be more appropriately called *ramunha*, its name in Nagô Candomblé.[28] This pattern appears in some passages of "Floresta Azul" either as a surface rhythm played by the *caxixi* (a basket-shaped rattle) or implied by the horn melodies.[29] For instance, the main theme aligns with ramunha as shown in Figure 26.

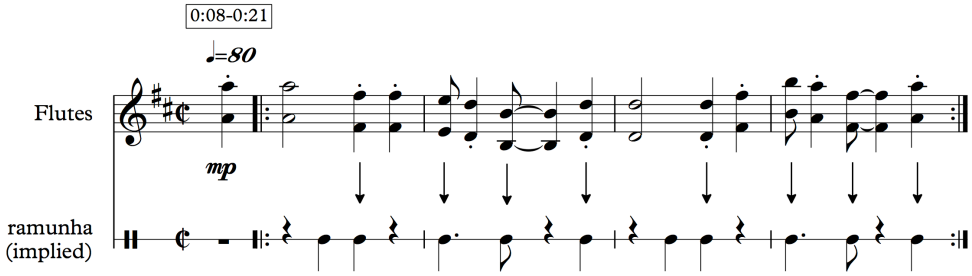


Figure 26. Main theme of "Floresta Azul" aligned with ramunha (0:08–0:21).

28. The pattern <33424> is also found in Candomblé houses associated with the Congo-Angola tradition, where it is called *congo* or *congo de ouro*. It may also appear in the repique of *samba-reggae* grooves in Bahian blocos afro, particularly when the groove is played at faster tempi (approximately 90 beats per minute and above).
29. A performance of "Floresta Azul" can be seen at https://www.youtube.com/watch?v=kXjyilEmD_s (Anchieta Theater of SESC Consolação, São Paulo, 2013).

Once this theme is introduced by the flutes at the beginning of the piece, it is presented in canon by the rest of the horns. Figure 27 shows the four staggered entries, each with its own implied ramunha timeline. Since the entries are separated by one bar (i.e., half of the timeline length), the combined texture produces a superimposition of staggered ramunha feels. The effect is as if the 2-side and 3-side of ramunha are felt simultaneously.

In the passage shown in Figure 27, the trombones' entry sets up a 2-3 orientation of ramunha that is "flipped" by the flugelhorns' entry before the first time cycle is completed. The saxes' entry "flips" again the orientation of the flugelhorns, but reinforces the original one of the trombones. Finally, the flutes "flip" one last time the orientation of the saxes and trombones but reinforce that of the flugelhorns. The overall effect can be explained as a coexistence of the two timeline orientations. I call this rhythmic process *staggered* or *rotated timeline alignment* in reference to the fact that the music is simultaneously aligned to two rotations of the same timeline.[30]

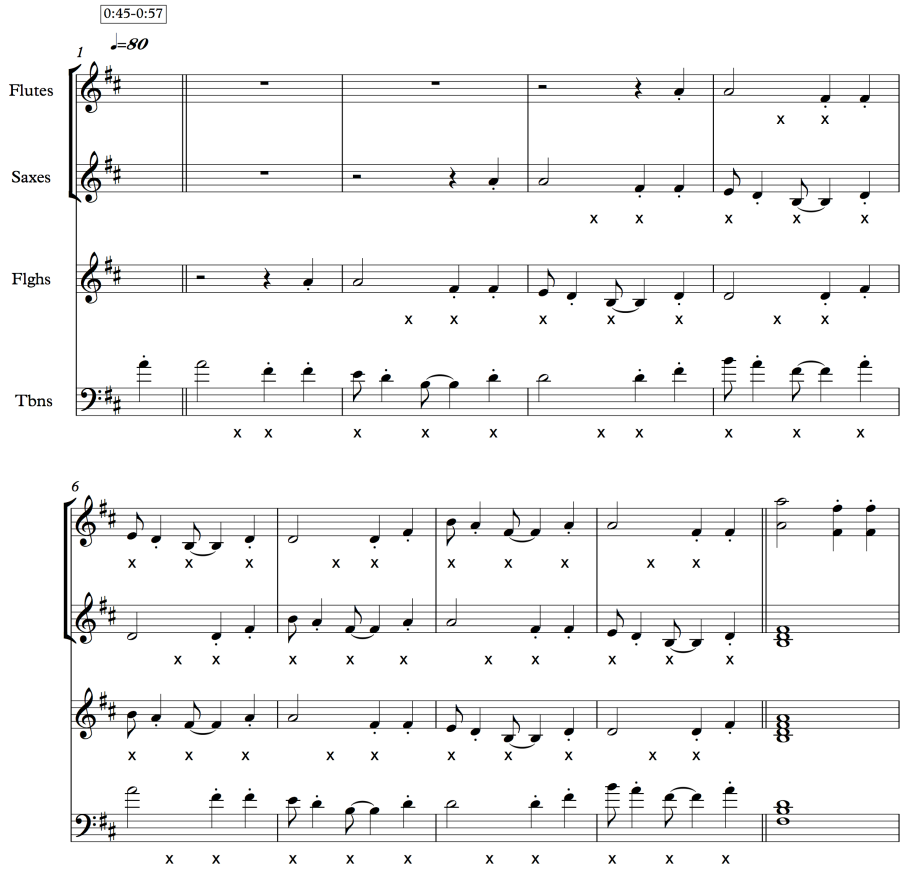


Figure 27. Main theme of "Floresta Azul" presented in canon (0:45–0:57). The "x" represents the strokes of the implied ramunha feel.

30. Although this procedure can be compared to timeline pendularity—a new RTP is asserted at certain point, inducing a new timeline orientation that is subsequently reaffirmed by the ensemble—the overall effect is better explained as a coexistence of the two timeline orientations (for a fuller discussion of pendularity in Afro-Cuban clave, see Stover 2009, 58–67).

A later passage of "Floresta Azul" features another example of the same phenomenon, where the caxixi articulates ramunha in a 3-2 orientation (with the tuba reinforcing this feel), while the main melody played by the flutes and flugelhorns aligns with the same timeline but in 2-3 orientation (see Figure 28).

The potential of rotated timeline alignment to increase perceived rhythmic complexity via ambiguity is comparable to that of the examples of timeline rotation discussed above. In the case shown in Figure 28, the RTP of the implied timeline may compete with that of the heard timeline. Rotated timeline alignment as a source of rhythmic complexity requires that one of the timelines be perceived as the main rhythmic reference while the other competes with that reference. This is likely the case with most Bahian listeners who are familiar with the traditional timelines used by Rumpilezz.[31]

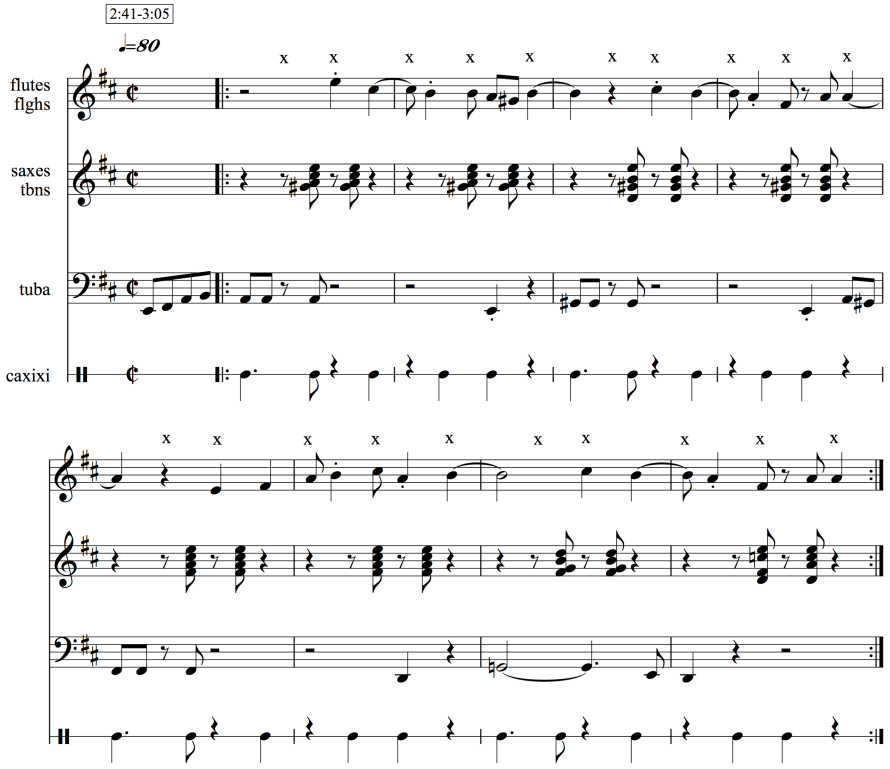


Figure 28. Rotated timeline alignment in "Floresta Azul" (2:41–3:05). The "x" represents the strokes of the implied ramunha feel.

31. Justin London (2012) argues that the separate identities of two rhythms in a polyrhythmic texture may collapse into each other, losing their separate identities in the mind of the listener. While this collapse into a single composite rhythm is possible in various kinds of Afro-Brazilian ensembles (e.g., the four surdo parts of a carnival samba-reggae groove may be heard as one elaborate pattern), the collapse of two implied or explicit timelines is unlikely for Afro-Bahian audiences due to the strong familiarity people have with these timelines and to their powerful affective force.

Rotated Timeline Alignment in "Dasarábias"

"Dasarábias," discussed above in terms of its use of a vassi rotation, features a more elaborate case of rotated timeline alignment. The bell articulates rotation 3 of vassi and the tuba bass line clearly aligns with it (see Figure 29). However, the main melody played by the piccolo and flute in the first two bars of Figure 29 plays the same rhythm one eighth note earlier; that is, following rotation 4 of vassi.

Separated by one subdivision, rotations 3 and 4 of vassi are highly contrasting: they have maximum timeline misalignment (5 non-simultaneities) and, as waves of metric strength in Figure 30 reflect, with the exception of the RTP, whenever one rotation articulates a metric beat, the other does not. This happens in both readings, 12/8 and 3/2, and contributes to its perceived complexity.

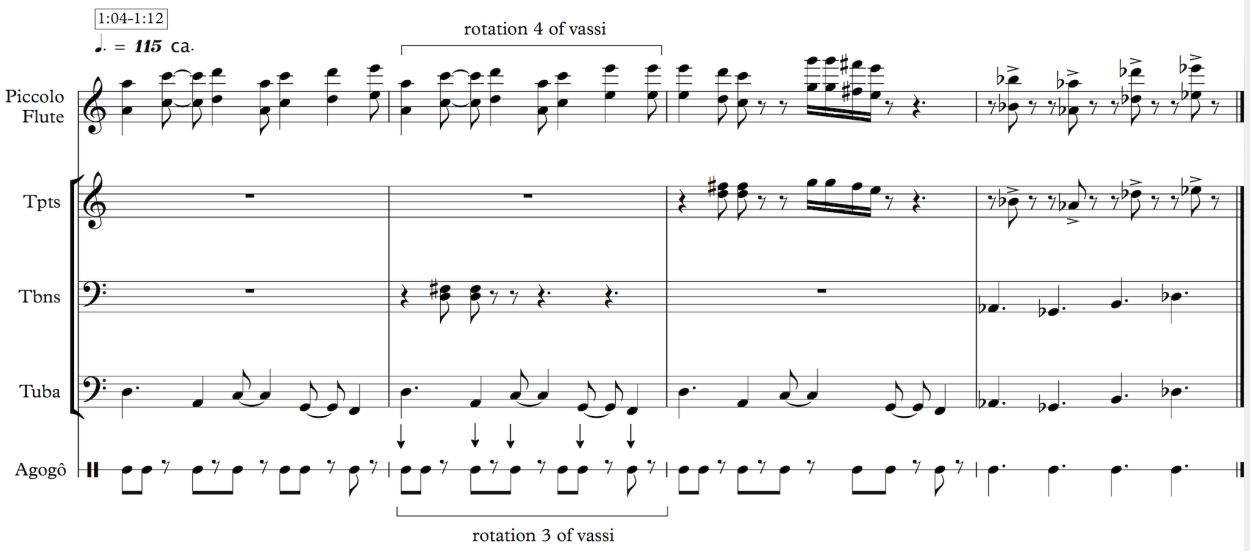


Figure 29. Rotated timeline alignment in "Dasarábias" (1:04–1:12).

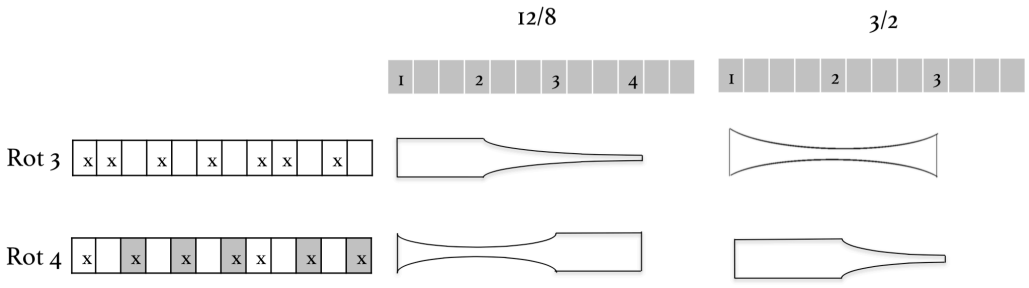


Figure 30. Two vassi rotations coexisting in "Dasarábias."

Rotated Timeline Alignment in "Adupe Fafá"

Examples of rotated timeline alignment in Rumpilezz also appear intermittently in truncated timelines. In "Adupe Fafá," based on the same timeline of "Anunciação," <22122>, the main theme also aligns with a rotated version of this 9/8 pattern. Figure 31 shows the five possible rotations of this pattern.

Rotation 1 is the only pattern aligning with a single metric beat and thus the most metrically dissonant. On the other hand, rotation 4 produces the more consistent grouping of twos, maximizing the cross-rhythmic effect (two-against-three) within the span of the timeline. As shown in Figure 32, these are precisely the two rotations coexisting in the main theme of "Adupe Fafá": one articulated by the agogô and the other one built into the main theme.

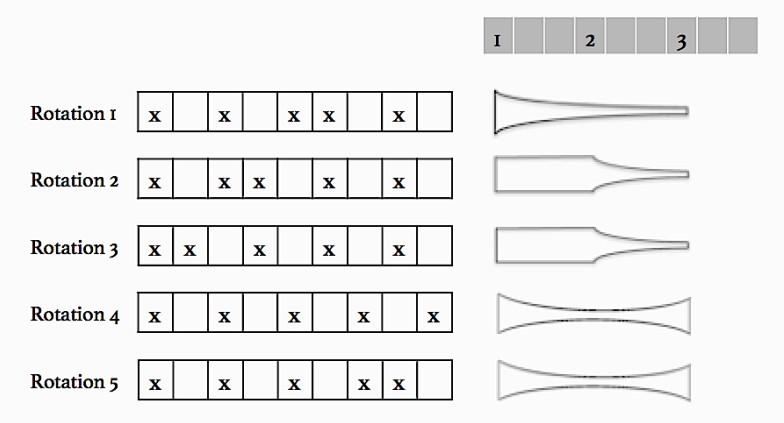


Figure 31. Five rotations of the "Adupe Fafá" timeline and corresponding waves of metric strength.

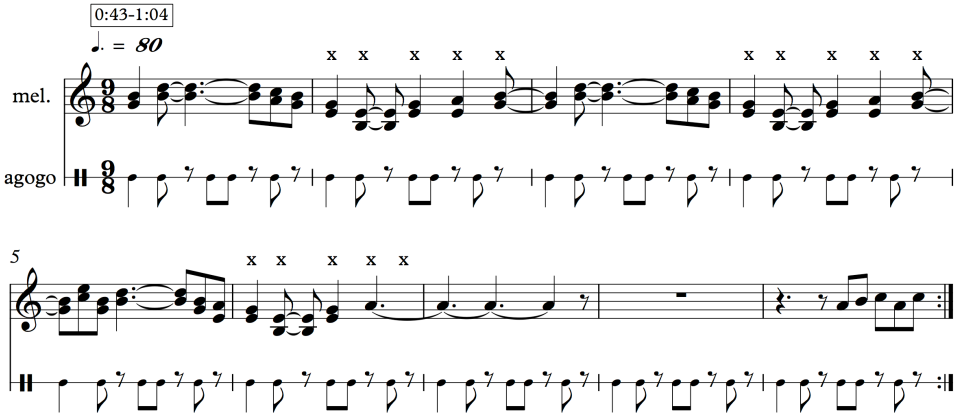


Figure 32. Rotated timeline alignment in "Adupe Fafá" (0:43–1:04).

To be sure, rotated timeline alignment is one of many forms of timeline alignment found in Rumpilezz's repertoire. The rhythms of Leite's horn lines may match agogô timelines literally (e.g., "Feira de Sete Portas" and "Anunciação"), reinforce the meter with short repetitive motifs that do not match any rotation of the timeline (e.g., "A Grande Mãe"), or reinforce groupings creating cross-rhythms competing with the metric beat (e.g., "A Grande Mãe").

Final Discussion

Through transformations of timelines found in traditional Afro-Bahian music and non-conventional patterns of timeline alignment, Orkestra Rumpilezz has created a distinct polyrhythmic sound that, many believe, represents the cutting edge of contemporary Afro-Bahian music.[32] By examining metric and timeline strength and misalignment and ambiguity of their transformed timelines and the textures organized around them, this paper has demonstrated that composer Letieres Leite creates grooves that are potentially perceived as rhythmically more complex than his sources of inspiration.[33] This reading of the orchestra's rhythmic materials is consistent with the public rhetoric of their members that emphasizes the "complex rhythmic structure of Afro-Bahian music" and the role of timelines as temporal organizers. It is also consistent with the notion that African and African-derived musics are centered on rhythm and are rhythmically complex, a central theme in discourses of black empowerment in Bahia and elsewhere. In many ways, the orchestra's treatment of timelines and rhythm is political, as it serves their stated goal to "elevate Afro-Bahian music to the status of jazz," a genre perceived locally as high art (Queiroz 2010; Diaz 2014).

The purpose of this essay has not been to reinforce the stereotype by establishing a correlation between rhythmic complexity and African-derived music, but to highlight how the notion has a real effect on musicians' activity. Michael Iyanaga's (2015, 184) discussion of Richard Waterman's (1948) distinction between "cultural intangibles" that are passively carried below consciousness and "overt manifestations" that are actively and consciously reproduced is useful to explain the difference. Leite's experimentations with timelines are

32. Many of the orchestra's fans that I interviewed in Salvador in 2012 expressed this opinion (e.g., Candomblé devotees Sandra Lima and Makota Valdina). Letieres Leite and the orchestra are routinely invited to perform at the bigger cities of the Brazilian South (Rio de Janeiro, São Paulo). During these visits, Leite gives workshops and lecture–demonstrations centered in Afro-Bahian rhythm and percussion. This has served to assert Rumpilezz's role as "ambassadors of contemporary Afro-Bahian music" in the country (TV Brasil 2012; SESC 2014).

33. In addition to rotating, truncating, and expanding traditional timelines and to rotated timeline alignment, the orchestra also juxtaposes timelines in the same piece. This is the case in "Temporal," featuring the bell patterns of *ilú*, <21212>, and ijexá, <122122222>; "O samba nasceu na Bahia," guided by the timelines of *samba duro*, <.x.x..x.x.x.x..x> (represented with x's and dots because the RTP is unarticulated), *samba chula*, <332>, and *kabila*, <212222212>; and "Mestre Bimba visita o Palácio de Ogum," which alternates vassi, <2212221>, and the bell pattern of *capoeira*, <3122>. The consecutive use of timelines is common in blocos afro carnival ensembles from Bahia where radical changes in the groove may be introduced after a rehearsed full break or *paradinha*. A global change of timeline (and by extension, of groove) within a piece does not necessarily imply an increase of rhythmic complexity, but draws attention to the temporal dimension of the music, reinforcing the orchestra's rhetoric of rhythmic centrality.

deliberate actions that embody and propagate the intangible—the notion of African rhythmicity that he and others hold.

Neither have I claimed that Rumpilezz's music is more complex than other musics in or outside the black Atlantic. There is, of course, much music that is far more rhythmically complex by any measure, with and without political underpinnings.[34] The goal was rather to study what the orchestra's composer understands as rhythmic complexity and how he achieves it.

The paper has documented examples where some instruments align to the main timeline of the piece (usually articulated by a bell) while others align to a different rotation of the same timeline. I have called these cases *rotated timeline alignment*. I do not claim that Leite necessarily conceptualized the rhythm of all the melodies discussed in this paper as rotations of the main timeline. In fact, for him all those melodies *follow* the timeline rigorously. What I propose is that he has chosen a more flexible way of following timelines to complicate rhythm and create particular sensations.

This type of alignment is not exclusive to Rumpilezz. In 1930, Cuban composer Amadeo Roldán composed "Ritmica No 5, for 11 percussionists," in which four instruments play clave in canon with each entry separated by one beat (Lehrman 2000). Examples of rotated timeline alignment are also found in many salsa arrangements from Latin American groups[35] as well as in the music of various Afro-Cuban jazz composers (e.g., Alejandro Vargas's *Trapiche* [2007] and Gonzalo Rubalcaba's *Supernova* [2001]), who deliberately match phrasing in a 3-2 clave orientation with a sounding clave in 2-3 (or vice versa). In the case of salsa, musicians are often criticized for infringing clave "rules."[36] Since these so-called rules are not strictly adhered to in Bahian music, nor in many other diasporic music cultures, I join Gerstin (2017) in proposing that we need to expand our concepts and vocabulary when studying timeline alignment in Brazil, Martinique, and other places of the diaspora, too. Rotated timeline alignment and

34. Take, for instance, works associated to the New Complexity Movement of the 1980s and 1990s, which used complexity as a way to elevate the aesthetic value of music (Boros 1993, 1994). These works are mostly associated with contemporary Western art music, and references to African or African diasporic rhythm are virtually nonexistent.

35. See Rebecca Simpson-Litke (2014) for examples of non-canonical use of clave (she uses the terms clave breaks, pauses, and flips) in Grupo Niche's "Cali Pachanguero," Joe Arroyo's "La Rebelión," Victor Manuelle's "He Tratado," and El Gran Combo's "Me Liberé."

36. Lisa Waxer (2002, 174) has written that Colombian salsa group Grupo Niche faced criticism from Puerto Rican and New York musicians and commentators for their use of clave in "Cali Pachanguero" and "Buenaventura y Caney." She wrote that Jairo Varela (the late orchestra's director) responded by "straightening out the clave and rewriting some of the horn parts and instrumental breaks. The new arrangements were recorded as a commemorative double album titled *Historia Musical* (1987)." For Waxer, "Varela's decision to release recordings of these arrangements suggests that he wished to broadcast a new, improved image of Grupo Niche as a polished orchestra on a par with world-class bands from Puerto Rico and New York" (174). Ben Lapidus (2015) also documented the case of Sonny Bravo, who is considered an authority on clave consciousness and adherence among the Latin music community in the U.S. not only by following scrupulously clave rules of alignment in hundreds of arrangements and performances, but also by criticizing so-called clave *infractions* by others.

alignment to odd timelines are steps towards a more inclusive timeline theory that converses with, benefits from, and looks beyond the Afro-Cuban clave model.

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