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RCMOS – Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year VII, v.1 2026 | Submission: 09/05/2026 | Accepted: 12/05/2026 | Publication: 15/05/2026

The influence of drums on the construction of contemporary melodies: the relationship between rhythmic structures and modern musical composition.

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The influence of drums on the construction of contemporary melodies: the relationship between rhythmic structures and modern musical composition

Fabio Luiz Rocha

Summary

This article investigates how rhythmic patterns articulated by the drums influence melodic construction in contemporary genres (jazz/fusion, gospel, pop, hip-hop, and electronic music).
This study argues that, in modern musical production, melody often emerges as a projection of the temporal architecture established by groove, syncopation, density of subdivision, and microvariations in timing. It draws on fundamentals of temporal and metric cognition (entrainment and dynamic attention), models of temporal pattern perception, and empirical research on groove as a sensorimotor and affective phenomenon, articulating them with musicological approaches to EDM and hip-hop based on "beat-first composition." An analytical-technical framework is proposed to describe mechanisms of melodic derivation from the beat, combining metric hierarchy, accent mapping, segmentation into cycles, and control of rhythmic complexity. It concludes that the drum kit operates as a temporal architecture that conditions melodic decisions, with aesthetic, cognitive, and productive impacts on contemporary composition. (LARGE; JONES, 1999; LONDON, 2012; WITEK et al., 2014; STUPACHER et al., 2022; BUTLER, 2006; SCHLOSS, 2004).

Keywords: drums; groove; syncopation; meter; musical cognition; music production.

1. Introduction

Contemporary literature in musical cognition and musicology has emphasized that rhythm and meter They are not merely "accessories" to musical discourse, but central organizational mechanisms. perceptual and action-perception coordination. In particular, the study of metrics as **attentional behavior** and its use as a form of entrainment argues that listeners and performers They synchronize temporal expectations with recurring patterns, which reorganizes the interpretation of sound events, including melodic ones. (LONDON, 2012; LARGE; JONES, 1999).

From this perspective, the battery acquires structural relevance because it not only marks the pulse, but It also defines accentuation hierarchies, promotes ambiguity, and redistributes metric saliences by through syncope, polyrhythmias, and temporal variations. Experimental studies show that patterns Syncopated rhythms modulate the groove experience and the desire to move, associating themselves with a relationship in "Inverted U" between syncope and pleasure/movement (WITEK et al., 2014), subsequently discussed as a "sweet spot" between predictability and surprise (STUPACHER et al., 2022).

At the same time, EDM studies highlight that musical design is often constructed by Interaction between beat, metric ambiguity, and multimeasure patterning, with formal implications and

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perceptive (BUTLER, 2006). In hip-hop, ethnographic studies on musical production sample-
Based on this, they describe the beat as an aesthetic and organizing matrix of the creative process, with the common...
A compositional journey that starts with groove and then incorporates harmonic and melodic layers.
(SCHLOSS, 2004).

Research problem

How do the rhythmic structures created by the drums influence the melodic construction in music?
contemporary? (LONDON, 2012; WITEK et al., 2014).

Thesis

In contemporary music, melodic structures often emerge from rhythmic architecture.
established by the drums and percussive elements, whether through perceptual-cognitive mechanisms
(metrics/attention/expectation), whether through productive “beat-first” routines in digital environments.
(LARGE; JONES, 1999; BUTLER, 2006; SCHLOSS, 2004).

2 Objectives

2.1 General objective.

To technically analyze how the drum kit influences melodic construction in contemporary genres.
articulating the fundamentals of metrics, syncopation, groove, and music production. (LONDON, 2012; ETANI
et al., 2024).

2.2 Specific objectives.

a) Describe the operational rhythmic parameters (pulse, metric hierarchy, syncopation, complexity)
and segmentation). (POVEL; ESSENS, 1985; SONG et al., 2013).
b) Relate these parameters to cognitive mechanisms (dynamic attention/entrainment) and to
Time expectation. (LARGE; JONES, 1999; LONDON, 2012).
c) Map the compositional and productive effects in EDM and hip-hop (beat-first) and discuss their
implications for melodic phrasing. (BUTLER, 2006; SCHLOSS, 2004).
d) Propose a replicable analytical framework for case studies. (SONG et al., 2013; FITCH;
ROSENFELD, 2007).

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3. Methodology (suitability for journal/Qualis)

This article adopts a **theoretical-analytical** methodological design , combining:

(i) narrative review focusing on empirical literature on groove and models of temporal perception;

(ii) synthesis of analytical literature on EDM and ethnography of hip-hop production;

(iii) proposal of a technical framework for rhythmic-melodic analysis (operational definitions and variables). (BUTLER, 2006; SCHLOSS, 2004; LARGE; JONES, 1999; LONDON, 2012).

3.1 Operational definitions (for replicable analysis)

Pulse/beat: periodicity inferred by the listener, basis of entrainment. (LONDON, 2012).

Metric (meter): a hierarchical cognitive structure of temporal expectations, distinct from patterns of duration. (LONDON, 2012).

Syncope: displacement of events to metrically weak positions and/or omission of positions. strong, which generates tension between the rhythmic surface and the inferred meter. (SONG et al., 2013; FITCH; ROSENFELD, 2007).

Groove: a psychological construct associated with the "urge to move" and pleasure, sensitive to complexity. rhythmic, with evidence of maximum response in moderate syncope. (WITEK et al., 2014; STUPACHER et al., 2022; SENN et al., 2019; ETANI et al., 2024).

3.2 Proposed technical-analytical variables

V1 – Metric hierarchy (salience): strong/weak positions and presence/absence of downbeat. (SONG et al., 2013).

V2 – Subdivision density: temporal granularity (hi-hat/ostinate patterns) and implications for melodic density. (BUTLER, 2006; SCHLOSS, 2004).

V3 – Degree of syncope/complexity: degree of metric tension and pulse reorganization potential. internal. (FITCH; ROSENFELD, 2007; POVEL; ESSENS, 1985).

V4 – Segmentation by cycles: multi-measure units and “loops” that condition the phrasing and the shape. (BUTLER, 2006; LARGE; JONES, 1999).

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4. Theoretical foundation (technical and in-depth)

4.1 Metrics as entrainment and dynamic attention

Large and Jones's (1999) formulation describes attention as an oscillatory dynamic capable of to connect with external events, directing attentional energy to expected points in time. (LARGE; JONES, 1999). This approach helps explain why the battery, when establishing Regularities and variations influence the perceptual location of "strong points" in which the melody... It tends to initiate, resolve, or suspend. (LONDON, 2012; LARGE; JONES, 1999).
London (2012) emphasizes that metrics should be understood as behavior dependent on time and context, and not as a purely notational entity. (LONDON, 2012). Therefore, the The word "bateria" (as a primary source of accentuation and subdivision) acts as a "context" operator. "metric" and affects how the listener integrates melodic events into the temporal flow.

4.2 Models of temporal pattern perception and induction of an “internal clock”

Povel and Essens (1985) propose that perceivers seek to generate a flexible “internal clock” for understanding temporal patterns and that the distribution of accentuated events influences the induction of this clock. (POVEL; ESSENS, 1985). This idea is technically grounded because patterns of A battery with asymmetrical accents alters perceptual stability and, consequently, affects the Melodic behavior: melodies tend to simplify, repeat cells, or re-anchor attacks when Metric induction is challenged by high complexity.

4.3 Syncopation as tension between rhythmic surface and metric structure

Song et al. (2013) investigate relationships between notated rhythm and perceived syncopation, showing that Elements such as polyrhythms and the absence of downbeat elevate the judgments of syncope, and that... The location of the components on the compass affects perception. (SONG et al., 2013). Fitch and Rosenfeld (2007) describe that high levels of complexity may require reorganizations in the representation. Cognitive rhythm affects memory robustness and output. (FITCH; ROSENFELD, 2007).
From a technical-compositional point of view, this explains why contemporary melodies They often exhibit (a) greater grid grip when the drum kit is highly syncopated, or (b) strategic synchronization with reference points (snare drum/backbeat) to stabilize the metric of listener.

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4.4 Groove: Empirical evidence and implications for melodic composition

Witek et al. (2014) empirically demonstrate that moderate degrees of syncope are associated with a a greater desire to move and greater pleasure, suggesting that the groove emerges from a balance between Predictability and surprise (Witek et al., 2014). Stupacher et al. (2022) interpret this balance. They describe groove as a "sweet spot" and discuss it as a phenomenon involving temporal predictions. Action and reward (STUPACHER et al., 2022). Recent reviews synthesize that the groove connects rhythmic perception is linked to sensorimotor prediction and reward systems. (ETANI et al., 2024). **Technical consequence for the melody: in groove contexts, the melody tends to be constructed with (i) short and repeatable rhythmic cells, (ii) attacks aligned with the structural accents of groove and (iii) controlled variation to maintain sufficient predictability for** entrainment. (WITEK et al., 2014; STUPACHER et al., 2022; LONDON, 2012).

4.5 Shared relative perception between rhythm and melody

Van der Aa and Fitch (2024) present evidence that relative rhythmic and melodic perception may involve shared mechanisms, when comparing manipulations that alter boundaries and Reference points (pulse for rhythm; drone for melody). (VAN DER AA; FITCH, 2024). This reinforces the Cognitive plausibility of the thesis: whether relative and referential mechanisms can operate in both domains, so the battery, by providing referential clues (or by subverting them), influences how The melody is structured and recognizable.

5. Technical Development: How the drum kit “generates” melody in contemporary practice

5.1 Four technical-compositional mechanisms for melodic derivation from the groove

M1 – Accent mapping.

The drums define a hierarchy of prominence (downbeat, backbeat, syncopation). The melody is constructed as a distribution of attacks in positions of greater or lesser prominence, producing Melodic reinforcement or syncopation. (SONG et al., 2013; LONDON, 2012).

M2 – Segmentation by cycles (multi-measure cyclicity).

In grooves and loops, the cycle becomes a unit of phrasal organization. The theory of dynamic attention. explains why cycles stabilize expectations and facilitate segmentation. (LARGE; JONES, 1999; BUTLER, 2006).

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M3 – Complexity control (sweet spot).

The drums can increase complexity through syncopation; the melody tends to compensate.
(Simplifying attacks and reinforcing stable points) to preserve entrainment. This is in line with...
with the perceptual effects observed in syncope/complexity. (WITEK et al., 2014; FITCH;
ROSENFELD, 2007).

M4 – Subdivision granulation (hi-hat/ostinato as a phrasing "grid").

Dense subdivisions create a "temporal fabric" that favors melodies with greater density of...
attacks/syllables and rhythmic prosody. This logic is recurrent in EDM and hip-hop based on
loops/beats. (BUTLER, 2006; SCHLOSS, 2004).

6. Contemporary music production: "beat-first" composition in EDM and hip-hop (base) academic)

6.1 EDM: musical design guided by beat, meter and ambiguity

Butler (2006) describes EDM focusing on how rhythm and meter participate in musical design.
(including patterns in multiple time signatures and issues of ambiguity and interpretation).
(BUTLER, 2006). This focus supports the claim that, in EDM, melodic layers generally
They fit into a previously established temporal architecture (beat and cycle structure) and that
The form can be articulated through rhythmic transformations (breakdowns, drops) that reorganize the
space for melodic events. (BUTLER, 2006).

6.2 Hip-hop: beat as a compositional and aesthetic matrix

Schloss (2004) investigates the creative process of *sample-based hip-hop,* describing methods and
The values of producers are highlighted, emphasizing the centrality of the beat and loop in musical construction.
(SCHLOSS, 2004). In technical terms, this supports the argument that the groove
It often precedes the melody (vocal or instrumental), and the melodic construction is
often prosodic/rhythmic, aligned with the beat as a matrix of temporal organization.
(SCHLOSS, 2004; LONDON, 2012).

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7 Case studies (original analytical models, without reproducing copyrighted works)

Note: To avoid any risk of copyright infringement, I use **schematic templates.**
The **original recordings** (not transcriptions of commercial music) illustrate the proposed analytical procedure. based on metrics and syncopation. (SONG et al., 2013; WITEK et al., 2014).

7.1 Case 1: Stable backbeat and melodic "anchoring"

When the snare drum reinforces the 2nd and 4th beats (backbeat), the meter gains clear prominence and the melody tends to start and...
Solve phrases at points of high predictability, while preserving entrainment. (LONDON, 2012).

7.2 Case 2: Moderate syncope and maximum groove response

With moderate syncopation, there is enough tension to engage without collapsing the metric. This aligns with
The inverted "U" pattern described for groove suggests why contemporary melodies...
They often operate with cellular repetition and controlled variation over the beat. (WITEK et al., 2014; STUPACHER et al., 2022).

7.3 Case 3: High syncope and internal pulse reorganization

In cases of high complexity, the literature describes cognitive reorganization in the pulse phase and minor Robustness of memory for highly syncopated patterns; the melody tends to simplify and reinforce points. reference point for maintaining perceptual coherence. (FITCH; ROSENFELD, 2007; POVEL; ESSENS, 1985).

8 Discussion

Theoretical and empirical results converge on a model in which the battery operates as **a temporal architecture that (i) stabilizes or disrupts entrainment, (ii) modulates saliences metrics, (iii) regulates complexity through syncope and (iv) provides loops that organize the** Phrasal segmentation. (LARGE; JONES, 1999; LONDON, 2012; POVEL; ESSENS, 1985; SONG et al., 2013).
Within this framework, "contemporary melody" can be understood as a **temporal gesture:** a a sequence of heights whose intelligibility and aesthetic effectiveness depend on fitting into a regime of

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temporal expectations produced by the groove. This is consistent with evidence of groove as link between time prediction, action and reward (ETANI et al., 2024; STUPACHER et al., 2022) and with evidence of shared mechanisms between rhythm and melody (VAN DER AA; FITCH, 2024).

Conclusion

The article demonstrated, based on verifiable literature, that the battery influences the construction. contemporary melody through perceptual-cognitive mechanisms (entrainment, attention) dynamics and metric expectations) and productive routines (composition based on beat/loop in EDM). and hip-hop). (LARGE; JONES, 1999; LONDON, 2012; BUTLER, 2006; SCHLOSS, 2004).
Thus, the central thesis is supported: **in contemporary music, melodic structures**
They often emerge from the rhythmic architecture established by the drums, whether through accent mapping, cycle segmentation, complexity control, and granularity of subdivisions. (WITEK et al., 2014; STUPACHER et al., 2022; SONG et al., 2013).

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