FROM EDM TO MATH ROCK:
METRICAL DISSONANCE IN THE MUSIC OF BATTLES

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ABSTRACT

With a sound once compared to an “army of glam-rock robots gargling sheet metal,”¹ the contemporary, New York City-based band Battles combines the visceral energy and timbres of indie rock with the repetitive, loop-based rhythmic structures of electronic dance music (EDM). Like EDM, metrical dissonance—the sounding of metrically conflicting rhythms—is pervasive, though with a degree of rhythmic complexity and instrumental virtuosity more commonly found in progressive rock, especially the “math rock” subgenre that emerged in the late 1980s.

In developing a methodology for studying metrical dissonance, theorists have focused primarily on classical music’s common-practice period, and generally ignored music from other genres—particularly un-notated genres in which metrical dissonance is a subjective experience, without visual cues such as time signatures and barlines. This paper uses terms and nomenclature developed by Harald Krebs to examine the ways metrical dissonance is created in Battles’ music and the role of the listener in determining metrical structure during moments of ambiguity. I will also draw on the work of Mark Butler, whose application of Krebs’ methods to EDM reveals processes of rhythmic layering and beat displacement similar to those used by Battles. Through the use of original transcriptions, I will argue that a listener’s metrical perception is guided largely by the drum pattern and hypermetric organization, including embedded hypermeasures in dissonant rhythmic layers. Five tracks serve as examples of metrical dissonance in Battles’ music: “DDiamondd,” “Rainbow,” “SZ2,” and “TRAS 2,” as well as “Tonto” in its studio, live, and remixed versions.

(http://www.guardian.co.uk/music/2007/may/19/popandrock.culture2)
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PART ONE:
About the Band,
Establishing a Methodology
CHAPTER 1: ABOUT THE BAND

Founded in 2002, Battles currently consists of Ian Williams on guitar and keyboards, John Stanier on drums, and Dave Konopka on guitar and bass. Former guitarist/keyboardist/vocalist Tyondai Braxton was the band’s de facto front man until he left in 2010 to focus on solo projects and avoid the rigors of constant touring.

Since its inception Battles has been hailed as a “supergroup” because of the pedigree of its members: Braxton is the son of composer and bandleader Anthony Braxton, Stanier was a longtime member of the popular hard rock band Helmut, and Ian Williams was a member of proto-“math rock” band Don Caballero from 1992-2000. This connection to Don Caballero has made Battles easy candidates for the “math rock” label as well, despite several inadequacies with the term (described below).

Before Braxton’s departure Battles released two EPs, four singles, and a studio album, *Mirrored* (Warp Records, 2007), that brought them critical acclaim\(^2\)—especially the single “Atlas,” which features Braxton’s squelchy, pitch-shifted vocals over a rumbling bass line and a pounding drum beat. The band’s first post-Braxton album, *Gloss Drop*, was released in 2011 and marks a shift toward a more pop-oriented sound, with little of the metrical and textural complexity that characterizes their earlier recordings. Braxton released a solo album in 2009 called *Central Market* that skillfully integrates orchestral elements into a dense soundscape of electric guitars, electronic beats, keyboards, samples, and vocals.

Battles’ sound reflects a broad range of influences, though three genres in particular continually surface in interviews and reviews: traditional African music, electronic dance music, and minimalism—all three of which are highly repetitive. Guitarist Ian Williams has noted that:

\(^2\) Described by the Guardian’s Tim Jonze as “so playful and mind-bogglingly complex that listening to it often feels like someone is trying to download several servers worth of Wikipedia down your nostrils” (http://www.guardian.co.uk/music/2007/may/19/popandrock.culture2).
The basic use of repetition connects [Battles] to so many different musical traditions... It's such a building block—it's used in everything from techno to African traditional music, and even in more formal classical music—the rolling line of a minimal line repeating, like Steve Reich or Terry Riley employed. Or even, like, speed metal, those fast, rolling riffs. I don’t think we’re necessarily trying to quote any of those things, but I think we definitely share that quality.³

Elsewhere Williams has identified the “two extreme poles” of “minimal techno and prog [rock]” in Battles’ music—extremes that are mediated by a “punk ethos” he associates with drummer John Stanier, whose significant contribution keeps the band’s music “as visceral as possible and not just an ear experience.”⁴ These “extreme poles” were combined with Braxton’s background as a trained composer and his avowed admiration for Debussy, Stockhausen, Varèse, and Stravinsky, whose Song of the Nightingale and Petrushka influenced large sections of Central Market.⁵

The influence of electronic dance music is particularly significant and the combination of electronic and rock elements lends Battles a distinct sound. DJ remixes of their music have frequently appeared on singles, culminating in Dross Glop, a 2012 compilation of twelve remixes, one for every track from the album Gloss Drop (2011). Tyondai Braxton has been active as a DJ

³ http://www.thenational.ae/arts-culture/music/battles-lose-lead-singer-but-put-a-positive-twist-on-the-situation
⁴ http://kickshuffle.com/2012/04/05/kickshuffle-exclusive-a-conversation-with-ian-williams-of-battles/
since before Battles formed and has remixed tracks by Extra Life, Minus the Bear, and Philip Glass (on REWORK, a collection that also includes a remix by Beck). Since 2006 they have been signed with Warp Records—a pioneering distributor of electronic music since the late 1980s—and remain one of the few artists on the label who are not exclusively electronic musicians. Several of their tracks directly reference electronic dance music, including “Fantasy.” Its release on EP C / B EP and the TRAS single includes “Parts II-X,” each of which is a four second clip of isolated, synthesized kick drum attacks—similar to the “stems” from which many remixes are made.6

1.1 Math Rock

Despite the confluence of diverse influences in their music, fans, critics, and detractors have been quick to apply the “math rock” label to everything Battles does—due, in part, to Ian Williams’ role in Don Caballero from 1992-2000. Math rock is a subgenre that emerged in the late 1980s and early 1990s, combining the distorted riffs of punk and heavy metal with the metrical complexity of 1970s progressive rock. The instrumentation is often based on a standard rock trio or quartet (with or without keyboards), but usually no vocalist—math rock bands are, first and foremost, instrumental.

Early math rock was grunge-like in its sound and presentation and is generally considered to be an offshoot of 1990s alternative rock, rather than an independent style of its own (Cateforis 243-244). There is little use of electronics (other than effects pedals) and no

6 A “stem” is an audio track, often containing a single instrumental layer, which can be combined with other layers to create a new mix. Other bands have released stems for their songs as well, including Radiohead, who released stems for the song “Nude” and then invited the public to upload remixes to their website. The response was so overwhelming that they repeated the project with their track “Reckoner” as well (http://www.radioheadremix.com/information/)
discernable influence from electronic dance music. In fact, much math rock is deliberately un-
danceable due to its lack of a "repetitive rhythmic character" or backbeat. "In the absence of a
steady, divisible pulse, math rock has instead been depicted as 'sharp,' 'jagged,' and 'angular'
music" (Cateforis: 245). This is the primary way in which Battles does not fit the math rock mold.
The band’s integration of electronic dance music extends to the use of danceable beats and,
though "jagged" and "angular" moments exist, there is greater emphasis on dance-ability (proof of
which can be seen in live performances).

Chord progressions are rare in math rock, with the primary focus being repetitive riffs and
ostinati in asymmetrical meters. Comparisons with minimalism are not out of place, although
there is less reliance on repetition as a large-scale formal element. While small sections may be
repetitive within themselves, the larger structure is often through-composed, focusing on one
short riff after another, rather than the slow development of a single idea. This through-composed
approach also distinguishes math rock from the verse-chorus song forms of mainstream rock
genres.

A statement on the sleeve of Don Caballero’s second album, Don Caballero 2, serves as
a manifesto for the math rock aesthetic: “Don Caballero is instrumental / Don Caballero is Rock
not Jazz / Don Caballero is free of solos.” Cateforis has remarked, “As these few pithy statements
indicate, math rock frowns upon virtuosity for the sake of showmanship. In this respect math rock
departs from the typical 1970s progressive rock or 1980s heavy metal band” (246). Though they
may not be “showy,” many math rockers are highly virtuosic on their instruments. Ian Williams, for
example, is known for his left-hand-tapping technique, in which he strikes a note on the guitar’s
neck with his left hand fingers, freeing his right hand to play a keyboard simultaneously. But in

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7 Especially as interpreted by progressive rockers King Crimson on their albums Discipline (1981)

8 The more common right-hand tapping, popularized by Eddie Van Halen, involves holding a note
or notes with the left hand, while striking the fretboard with the right hand further up the neck,
creating a fast alternation between the stopped and struck notes.
practice the technique, though very difficult, has an obvious practicality to it—unlike the lead guitarists of progressive rock and heavy metal whose displays contain a heavy dose of spectacle and “competitive individualism” (Walser: 278-280). In math rock, “the Dionysian heroic lead is cast aside, leaving only the music’s skeletal framework of riffs and patterns. In the end, math rock’s intense self-discipline and self-denial resembles most of all a form of musical asceticism” (Cateforis: 246).

The real virtuosity in math rock appears in the music itself, whose “shifting meters and complex rhythms give the illusion of a high surface density and musical complexity” (Cateforis: 253). Such unfamiliar patterns not only demand high levels of concentration from the performers, but from the audience as well. Being able to crack the song’s metrical code and parse the repeating patterns empowers the listener, who feels that they “get it.” This had led to the use of “math rock” as a “free-floating ‘complex’ signifier,” to be applied to any rock music considered to be “difficult” (Cateforis: 257). In this sense, labeling Battles “math rock” may be less about specific stylistic traits, or Ian Williams’ connection to Don Caballero, but simply a way of identifying complexity in the band’s music.

Despite the complexity, a typical math rock band’s approach to composition is not unlike that of traditional rock groups who communicate musical ideas orally, rather than with standard notation, and resist attempts—whether because of a lack of knowledge, or other, cultural, reasons—to analyze the details of that idea. While in Don Caballero, Ian Williams would “bring in the riffs for the new band material, play them, and then, if necessary, count them out to aid in the learning process.” As Cateforis points out, “The crucial point is that he would arrive at a pattern first, but would assign it a meter only at a later juncture. Like many rock musicians, then, math rock players do not want the compositional process to become premeditated” (Cateforis: 253).

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9 John Sheinbaum notes a general antagonism among rock musicians toward anything deviating from the “unstudied simplicity” of rock’s rhythm-and-blues roots (Sheinbaum: 21). Both progressive rock and math rock have been the focus of such antagonism, which may explain why they remain outside the mainstream.
Analyzing and labeling the meter thus serves solely as a memory aid, pinning down an idea that can otherwise remain open to each player’s (and listener’s) interpretation. Comparing this process to a mathematical problem, Cateforis believes that math rock musicians begin “with the answer key, and [fill] in the solution (the meter) only to make sense of the answer” (254).

Similarly, this paper’s approach to analyzing Battles’ use of metrical dissonance presents solutions to the answers already presented in their music, keeping in mind that, because the music is un-notated, there are often multiple solutions to the answers they present, which allows us to explore metrical dissonance from multiple levels of perception. But first a methodology must be established in order to define the language and nomenclature on which the analyses in Part Two are based.
CHAPTER 2: ESTABLISHING A METHODOLOGY

The work of Harald Krebs has been critical in establishing a methodology for the study of metrical dissonance. I will begin by discussing the basic principles of Krebs’ methodology and then focus on Mark Butler’s application and extension of these principles to electronic dance music. Together the work of these two scholars establishes the groundwork for Part Two of this paper, in which Butler’s approach is applied and adapted to the music of Battles.

Krebs’ work is based on the conception of meter, first proposed by Maury Yeston, as a “set of interacting layers of motion.” These “layers of motion” are divided into three classes: the “pulse layer, micropulses, and interpretive layers.” He defines these three classes as follows:

The pulse layer is the most quickly moving pervasive series of pulses, generally arising from a more or less constant series of attacks on the musical surface [...] More quickly moving layers, or “micropulses,” may intermittently be woven into the metrical tapestry of a work as coloristic embellishments. Of greater significance are series of regularly recurring pulses that move more slowly than the pulse layer. These allow the listener to “interpret” the raw data of the pulse layer by organizing its pulses into larger units. The pulses of each “interpretive layer” subsume a constant number of pulse-layer attacks; an interpretive layer can therefore be characterized by an integer denoting this constant quantity. I refer to this integer n as the “cardinality” of the layer, and to an interpretive layer of cardinality n as an “n-layer.” (Krebs 1999: 23, italics his)

In the figure below, the top layer, a steady stream of unaccented eighth notes, represents the pulse layer, while the two layers below represent two different interpretive layers. These move
slower than the pulse layer and are labeled according to the number of pulse-layer attacks they contain, a number referred to as the "cardinality" of that layer. In this example, interpretive layer 1 has a cardinality of 2, since each quarter note contains two eighth notes (i.e., “pulse attacks”). Interpretive layer 2 has a cardinality of 4 because each half note contains four pulse attacks. One can therefore describe the first interpretive layer as a 2-layer and the second as a 4-layer.

**Figure 1: Metrically consonant interpretive layers**

<table>
<thead>
<tr>
<th>Pulse Layer</th>
<th>Interpretive Layer 1 (2-layer)</th>
<th>Interpretive Layer 2 (4-layer)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 2 2 2 2 2 2 2</td>
<td>4 4 4 4</td>
</tr>
</tbody>
</table>

Though every interpretive layer will align with its pulse layer, two or more interpretive layers may or may not always align with one another. In the example above, the 2-layer and 4-layer are considered aligned because each attack in the slower, 4-layer coincides with an attack in the 2-layer. Though there is nothing to indicate a specific meter (such as accents or other forms of rhythmic stress), these layers are metrically “consonant.”

### 2.1 Grouping Dissonance

The alignment in Figure 1 is disrupted in the next example by changing Interpretive Layer 2’s rhythmic values to dotted quarters, creating a 3-layer (because it contains three pulse layer attacks). Now only every other attack in Layer 2 aligns with Layer 1—a misalignment termed metrical “dissonance.”
Krebs calls misalignments of this kind “grouping” dissonance. Grouping dissonance is defined as the superimposition of two or more layers with different cardinalities which are not multiples or factors of each other. The example above, grouping a 3-layer and a 2-layer, is the most commonly encountered form of grouping dissonance, known as a hemiola.\(^{10}\)

In Krebs’ nomenclature, grouping dissonance is designated by a “G,” followed by the ratio of the cardinalities involved in descending order, and a parenthetical insert defining the unit of pulse being counted.\(^{11}\) The dissonance above is labeled “G3/2 (eighth=1)” because the three-against-two conflict happens at the eighth note level, making that our primary unit of measurement (1999: 31).

\(^{10}\) For clarity, interpretive layers are only presented as multiples or divisions of an easily felt, supertactile pulse layer. There may also be circumstances in which the pulse layer is not easily felt, such as a steady stream of triplet and non-triplet eighth notes. In the absence of other prominent interpretive layers the common pulse unit would be triplet sixteenth notes, which are not easily perceived.

\(^{11}\) Grouping dissonances with more than two layers are called “compound dissonances” and are still listed in descending order. The end of Battles’ “SZ2,” for example, has a compound dissonance of G7/5/4/3 (quarter=1).
Figure 3: Grouping dissonance nomenclature and cycles

A defining feature of grouping dissonance is the periodic alignment of the layers in a “cycle” whose length is equal to the product of the two cardinalities. G3/2 (eighth=1) has a cycle of six eighth notes (3 x 2 = 6), at which point each pattern will realign. Richard Cohn describes these groupings, in which durations are multiples of two or more different primes (e.g., six and twelve), as “mixed spans,” as opposed to “pure spans” in which every rhythmic level is a multiple or factor of a single prime (e.g., 4, 8, 16, etc. for “pure duple,” and 9, 27, 81, etc. for “pure triple”) (1992a: 194-195). A hemiola (i.e., G3/2) is, for Cohn, the “prototype for such interpretational conflicts” and he considers all such conflicts within mixed spans to “[represent] a generalization of the concept of hemiola” (1992a: 195). Discussing Cohn, Mark Butler writes: “The ability to be divided by both two and three makes durations such as six and twelve inherently more capable of supporting complex rhythmic and metrical phenomena” (Butler 2006: 81).

Mixed spans are especially prevalent in traditional Central African music and feature what Simha Arom calls “polyrhythmics,” in which “several rhythmic events are found to occur simultaneously…In metric terms, this means that different periodic forms are superposed” (Arom 1991: 231). These superposed periods “provide a temporal framework for rhythmic events” whose unit of measurement is—like Krebs—the pulse, which is “the common regulator of temporal organization for all the parts.” Arom calls the recurring re-alignment of rhythmic events a

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12 Cohn acknowledges that asymmetrical divisions are also possible and common, but mixed spans have the unique ability to evenly contain durations with two or more primes (1992b: 11).
“macro-period,” defined as the “cycle resulting from the superposition of periods of different dimensions” (Arom 1989: 91-92, italics mine). Interestingly, Arom defines a period as a “temporal loop” (emphasis mine)—a term with obvious connections to the use of digital looping technology in electronic dance music and Battles. 13

2.2 Displacement Dissonance

Two or more layers with the same cardinality can be metrically dissonant if they are offset from one another, as below. Here both interpretive layers have a cardinality of 2, but are offset by one pulse attack (i.e., eighth note), which misaligns them and creates metrical dissonance.

Figure 4: Metrically dissonant interpretive layers (displacement dissonance)

This dissonance would likely be heard as syncopation, which the Oxford Companion to Music defines as “the displacement of the normal musical accent from a strong beat to a weak

13 Though my focus here is on the application of Krebs’ methodology to Battles via Butler’s analyses of electronic dance music, similarities with traditional African music are numerous and deserve a paper devoted to the topic.
one” (emphasis mine). Though most syncopations reinforce a particular interpretive level, it is possible to emphasize a syncopation to such an extent that what was formerly perceived as off the beat is now on, and vice versa. This phenomenon, which Butler calls “turning the beat around,” is the focus of much discussion in his analyses of electronic dance music, and will feature in analyses of Battles’ “Tonto” and “SZ2” in Part Two of this paper.

Because such reorientations are possible, some flexibility can be allowed when discussing displacement dissonances like the one above and care taken to distinguish when a rhythm is reinforcing a metrical interpretation (i.e., syncopation), when it is challenging it, and when the situation is simply too ambiguous to decide one way or another. This can be highly subjective, so I will use Butler’s distinctions between “conservative” and “radical” listeners to allow for multiple interpretations of ambiguous moments (2006: 126-127).

Unlike grouping dissonances, displacement dissonances will never align, since they are, by definition, always the same distance apart. Krebs notates this distance with the formula “Dx+a,” where “D” stands for “displacement,” “x” for the shared cardinality of the layers, and “a” for the “displacement index”—the amount by which one layer is displaced from the other. Thus, the displacement in Figure 4 is notated as D2+1, since both interpretive layers share a cardinality of two eighth notes, and are displaced from each another by one eighth note (1999: 35). Parentheses once again identify the eighth note as our unit of measurement.

14 Butler takes issue with Krebs’ analyses of all syncopations as displacement dissonances and includes a critique of Krebs by Robert Hatten, who argues that “actual metrical displacement reorients one layer’s perceived downbeat, creating a sense of displacement between contradictory metrical fields…syncopation achieves its dislocating effect by means of various phenomenal accents that work against, but do not contradict, the downbeat…of the primary metrical field” (Butler 2006: 109-110, fn.).

15 Krebs assumes that most displacements are heard in a “forward” manner, so that the level that sounds after the first is the one being displaced, rather than the other way around. However, recognizing that some displacements are perceived as being “early,” he appends his labeling with
Although not all displacement dissonances are syncopations, they all contain a “metrical layer” and one or more “antimetrical layers” (1999: 34). Deciding which is metrical is easy enough in the notated music Krebs analyzes, in which, thanks to time signatures and barlines, one is constantly reminded of what he terms the “primary metrical consonance.”

2.3 Primary Metrical Consonance

One of the more problematic features of Krebs’ methodology, at least when applied to un-notated music, is the idea of “primary metrical consonance.” Krebs writes:

In clearly metrical music, one of the metrical interpretive layers generally assumes particular significance for the listener, its pulses becoming reference points for all rhythmic activity in the given work. The layer formed by these pulses frequently, though not always, occupies a privileged position in the score, being rendered visually apparent by notational features such as bar lines and beams. I refer to this layer […] as the “primary metrical layer,” and to the consonance that it creates in interaction with the pulse layer as the “primary consonance” of the work (1999: 30).

a minus sign when appropriate (for example, D3+1 could also be written as “D3-2”), but reserves this notation for very particular circumstances (1999: 35).
And, in an earlier essay, he says:

The performer’s constant awareness of the primary consonance will likely be reflected in the performance and will be communicated to the listener. Thus, the primary metrical consonance remains subliminally present where it is contradicted on the surface. It acts as a constant frame of reference for metrical perception, just as the background tonic triad in the pitch domain acts as an omnipresent subliminal reference point for the hearing of the harmonic events of a given tonal work. The fact that the primary metrical consonance acts as a constant frame of reference explains the unequal prominence of the levels in many dissonant collections […] Given that the primary consonance has been clearly established as such in the preceding music, a level conveying that consonance will be perceived as the most significant level of a given collection, and levels conflicting with it as less significant metrical embellishments. (1987: 105-106)

Krebs’ emphasis on a primary consonance makes sense in the context of pre-twentieth century classical music (the subject of nearly all his analyses, Schumann in particular), where the composer’s metrical intention is clearly indicated by the notation.16 As Krebs shows, metrical

16 Krebs 1987 also looks, in passing, at works by Webern and Ravel, as well as three works by Stravinsky (L’histoire du Soldat, Sacre du printemps, and Three Pieces for String Quartet). However, all of these works still make use of time signatures and barlines—though the Stravinsky examples come closest to the kinds of non-“ornamental” dissonance found in Battles and electronic dance music. As mentioned above, Tyondai Braxton has cited Stravinsky as a major influence in several interviews.
Dissonance in this repertoire is “ornamental” and “embellishing” and, as such, is always resolved (i.e., realigned) by the end of the work (2003: 83). This “ornamental” quality distinguishes metrical dissonance from polymeter, in which multiple metrical levels are emphasized equally (as in Charles Ives, among others), as well as traditional African polyrhythm, which ignores meter altogether and recognizes only the pulse and each individual rhythm’s relation to it.

But what about other music that is not notated, like Battles? What is the function of meter and measure in their music, particularly in moments of metrical dissonance? Can a primary metrical consonance exist without a written score? Mark Butler’s Krebsian analyses of metrical dissonance in electronic dance music look at these questions and more, providing a wealth of conceptual tools that I will apply to Battles’ music through the rest of this paper.
CHAPTER 3: METRICAL DISsonANCE IN ELECTRONIC DANCE MUSIC

The influence of electronic dance music is particularly strong in Battles’ music, as is the seamless integration of electronics into what is otherwise standard rock quartet instrumentation. Synthesizers, laptops, and effects pedals all feature prominently both live and in the studio, but no technology is more integral to the construction of their music than digital “loopers.”\(^\text{17}\) Ian Williams has put it simply: “With Battles, each song starts with a loop.”\(^\text{18}\)

Braxton has elaborated on the role loops play(ed) in the compositional process:

None of that music was composed in a way where we were thinking about meter or key. Loops are established and then are used more as a pulse. No one was a slave to the meter of the loop. Events were created on top of the loops and would have stupid names so we could remember them […] [It is] important to look at these pieces of gear, in this case guitar pedals and loopers as instruments to master…as opposed to just accessories [sic] (personal correspondence).

\(^{17}\) I use “looper” to refer broadly to any piece of digital technology whose purpose is to repeat a sound segment indefinitely. Many different loop pedals, including the Akai Headrush, Boss LoopStation RC-20XL, and Line 6 DL4 Delay Modeler have all been attributed to the band, but the Gibson Echoplex seems to be their predominant looper these days. Ian Williams has also mentioned using Ableton Live, and Braxton’s solo act uses Max/MSP. (His patch, designed by Preshish Moments, can be seen at http://preshishmoments.com/wp-content/uploads/2011/03/TyBraxTrigFinOpen.png.)

\(^{18}\) http://kickshuffle.com/2012/04/05/kickshuffle-exclusive-a-conversation-with-ian-williams-of-battles/
Their emphasis on layering loops and viewing their gear as “instruments to master,” connects Battles’ working method to that of electronic dance music (EDM\textsuperscript{19}). Both Battles and EDM are loop-based, beat-oriented, and highly repetitive. There is also a “modular” quality to both, with short loops of relatively equal prominence functioning as independent units that can be brought in and out of a texture with seemingly little regard to meter or key, as Braxton describes above.\textsuperscript{20} These similarities in working method are reflected in their presentation and handling of metrical dissonance as well.

Mark Butler’s book \textit{Unlocking the Groove} uses Krebs’ methodology to examine metrical dissonance in EDM, identifying both grouping and displacement dissonance in many EDM examples. Yet Butler also makes several important distinctions between EDM and the common practice classical music in Krebs’ examples. Among these are stylistic issues of texture, process, and repetition that, while not exclusive to EDM, certainly distinguish it from the common practice. There are also issues related to the application of Krebsian methods to un-notated music, and the role of the listener in determining for themselves the metrical state of a given moment. All of these distinctions are relevant to a study of Battles’ music, and so I will spend some time discussing Butler’s analyses here in order to provide a better context for my own examples in Part Two.

In addition to the issues mentioned above, Butler only begrudgingly applies the term “dissonance” to metrical non-alignment in EDM. Unlike Krebs’ examples, “dissonant” layers in EDM are not embellishments, but are integral to the structure of the track. As such, they are not obliged to resolve the way they do in the common practice: “A mixture of ‘metrical’ and dissonant

\textsuperscript{19} For consistency I will follow Butler’s lead and use “electronic dance music” (“EDM”) as a catchall term for beat-oriented music that is generated almost entirely by computers, synthesizers, and drum machines. This includes techno, jungle, drum n’ bass, house, IDM, etc.

\textsuperscript{20} Battles’ harmonic language is outside of this paper’s scope, though there may be little to say about it in any case. Their extensive use of loops necessitates a harmonic world whose pitch content is static but whose tonal center is flexible—exploiting, for example, the ambiguity between D Dorian and A Aeolian.
layers is normative, and works often end by highlighting the dissonant states with which they began” (2006: 169-170).

This “mixture of ‘metrical’ and dissonant layers” challenges Krebs’ notion of primary metrical consonance, since the absence of metrical resolution (or a notated score for clues) compounds the rhythmic ambiguity, leaving it to listeners to decide for themselves the primary consonance of a given moment: “[The music] encourage[s] each of us to seek out our own preferred interpretation—to actively participate in the construal of our musical experience” (2006: 127) and to “chart [our] way through an interpretively open soundscape in which ambiguous structuring and divergent metrical paths enable diverse experiences in time” (2006: 166).

Recognizing the subjectivity of these experiences, listeners are divided into two broad categories, “conservatives” and “radicals,” based on their adherence to “established metrical interpretations.” “Conservative listeners tend to hold [on]…for as long as possible, whereas radicals move on to new interpretations more readily. Moreover, individual listeners may also interpret the same musical configuration in multiple ways as its cycles unfold; the repetitiveness of electronic dance music gives listeners plenty of time to experiment with different ways of hearing” (2006: 126-127).

Despite EDM’s challenge to primary metrical consonance (and his own concerns about the term), Butler ultimately retains the term “dissonance,” citing the literal meaning “to sound apart.” But he makes it clear that metrical dissonance in EDM is structural, not embellishing, and as such is not required to resolve. Similar issues of resolution and ambiguity are frequently encountered in Battles’ music, and, though I have similar reservations about the term, I will be following Butler in retaining the term “dissonance,” with all of his caveats cited above.

3.1 Grouping Dissonance in Electronic Dance Music

While Krebs’ nineteenth-century examples of grouping dissonance are embellishing and generally short-lived within the composition, Butler identifies several EDM tracks in which grouping
dissonance has a long-lasting, structural function. The first of these, Azzido Da Bass’ “Dooms Night (Timo Maas Mix),” is reproduced below.

**Figure 5: Azzido Da Bass, "Dooms Night (Timo Maas Mix)" (Butler ex. 4.15)**

Butler’s transcription and analysis identifies a G3/2 (eighth=1) dissonance between Synth 3 and the other instruments, which are in 4/4. This G3/2 dissonance, which has a cycle of three quarter notes, generates a larger G4/3 (quarter=1) dissonance with a cycle of twelve quarter notes (three measures). The two-bar phrasing of the bass line extends this cycle even further, so that all layers take twenty-four beats (six measures) to re-align. He terms this generative relationship “embedded grouping dissonance” and identifies three distinct features of this subcategory:
First, the presentation of more than one grouping dissonance at the same time; second, the presentation of grouping dissonance on more than one metrical level; and third, a causal relationship in which the non-congruence of the lower-level dissonance’s cycle generates the larger dissonance. (2006: 158, italics his)

Embedded grouping dissonance sets EDM apart from traditional music theory repertoire, in which metrical dissonances are ornamental to a primary consonance and generally short-lived. It is, however, pervasive throughout Battles’ music due to their similar use of repetition as a primary structural component. Many of Battles’ tracks make use of the same embedded grouping dissonance as “Dooms Night (Timo Maas Mix),” including the following excerpt from “SZ2”\(^{21}\):

**Figure 6: Battles, "SZ2" (2:55-3:03), embedded grouping dissonance**

\(^{21}\) A full transcription of “SZ2” can be found in the Appendix.
Here a 3-layer in Gtr. 2 creates a grouping dissonance against 2-layers in the other instruments, which, in turn, generates a G4/3 dissonance at the quarter note level. This particular combination of layers is consistent with every example of embedded grouping dissonance that Butler presents, all of which “consistently involve a fundamental conflict between the pure-duple values of 4/4 meter and a pure-triple dissonance...[that] often consists of dotted quarter notes” (2006: 158).

Although pure-duple/-triple conflicts are very common in Battles, other values that are absent from EDM, such as five and seven, can be found as well. Such conflicts, as Butler says, “quickly generate cycles of extreme length...thereby stretching the limits of perceptibility” (2006: 164, fn.). For example, a compound grouping dissonance of G7/5/4 in “SZ2” suggests a cycle that is one hundred and forty beats long (7 x 5 x 4 = 140)—though, as with most examples of compound dissonance in Battles, these layers are transformed or removed long before the completion of even one cycle. In addition to “SZ2,” Part Two will examine more examples of this in the tracks “Ddiamonddd,” “Rainbow,” and “TRAS 2.”

3.2 Displacement Dissonance in Electronic Dance Music

Displaced percussion patterns are a common feature of EDM, often presented as a bass drum and hi-hat (or snare) displaced by one eighth note, as below (Cf. Chapter 2.2).

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22 Unlike Butler, I am using slurs to indicate layers outside the primary consonance. Solid slurs group the larger rhythmic grouping, dashed slurs indicate the smaller grouping.
Figure 7: Typical percussion displacement in EDM

Unlike the common practice repertoire in Krebs’ analyses, “layers in electronic dance music often change identity as new interpretive contexts emerge” (2006: 140). This change is possible because of EDM’s “heightened emphasis on process,” which “draws the listener in and sustains interest within a minimal, repetitive context” (141, 113, italics his). The most distinctive of these processes is metric inversion, or, as Butler terms it, “turning the beat around” (141). Turning the beat around involves the abrupt entrance of a prominent new layer (usually the bass drum) that inverts the listener’s perception of the beat, switching downbeats to offbeats, and vice versa. Rather than embellishing a primary consonance, turning the beat around creates a new consonance, although the listener’s perception of this shift will vary depending on how “conservative” or “radical” they are. Conservative listeners will hear the new layer as being highly syncopated, while radicals will immediately perceive a new metrical consonance. Turning the beat around is most commonly found “near the beginning of a track, in association with a gradual buildup of the texture” (144).

This process occurs in Underworld’s “Cups,” shown here in Butler’s transcription. The passage begins with a one-bar synth line in 4/4 (Synth 1) that repeats four times before the hi-hat enters playing an unarticulated onbeat pulse. Together the two layers play four times; however, on the last eighth note of the last repeat a kick drum enters with a one-bar 4/4 pattern that is highly syncopated relative to the synth and hi-hat—so syncopated, in fact, that our perception of the beat shifts one eighth note to the left, and with it the downbeat of the other two patterns, as shown in Figure 9.
The rhythmic levels in the synth and drum have a shared cardinality of eight eighth notes (a small “8” indicates the starting point of each level’s pattern), with Synth 1 displaced one eighth note to the right, hence the designation “D8+1 (eighth=1).”

Despite entering four bars before the drum, it is the synth and hi-hat that sound displaced, not the other way around. Because of their greater volume and resonance, drums often serve as the listener’s reference point in moments of metrical ambiguity (142). Butler notes that:

23 Cf. Covach 1997 discussing Yes’ “Close to the Edge”: “Because rock listeners tend to take their tempo and metric bearings from the drums…a listener is not likely to hear [this passage] in terms of polymeter and is much more likely to hear [the first verse] in [the meter of the drums]” (11-13).
The tendency of low drumbeats to occur on the beats…(and of hi-hats to occur on the offbeats) supports a radical hearing, as does the fact that the drum pattern begins one eighth note \textit{before} the synth and hi-hat patterns (if it were an eighth-note backbeat, it would more logically begin on the “and” of beat one). (143 fn., italics his)

It is not only the drums’ resonance that makes them so influential, but also the listener's familiarity with the patterns themselves. Listeners are used to hearing hi-hats on the offbeats, and can easily discard their “onbeat” pulse once a kick drum has presented a plausible, alternate downbeat.

A similar circumstance occurs in the opening of Battles’ “Tonto,” in which 4/4 riffs are “turned around” by the entrance of the full drum kit, creating a D8+5 (eighth=1) dissonance. Here too our inclination to hear low drums \textit{on} the beats and hi-hats \textit{off} the beats supports a radical shift, as does the stylistic rock norm of snare hits on beats 2 and 4 (“backbeats”).

Figure 10: Battles, "Tonto" (0:40-0:46), “turning the beat around"
CHAPTER 4: METRICAL DISSONANCE & STYLISTIC NORMS

When analyzing Battles’ music, it will be necessary to discuss the role of stylistic rock norms, and how those norms affect the listener’s interpretation of metrical dissonance. The two most prominent of these norms are the standard rock drumbeat and four-bar hypermeter. Though neither is exclusive to rock music, they both play significant roles in the organization of time and meter within the genre.

4.1 Standard Rock Drumbeat

The standard rock drumbeat consists of four primary features, each of which is subject to variation:

1. 4/4 time

2. Repeated eighth notes on the hi-hat or ride cymbal

3. Kick drum attacks on beats one and three

4. Snare attacks on beats two and four—the “backbeats”

All of these features reinforce the duple cycles that are fundamental to rock music and are in line with Lerdahl and Jackendoff’s Metrical Preference Rule 10 (Binary Regularity): “Prefer metrical structures in which at each level every other beat is strong. MPR 10 allows metrical

\[ \text{All features reinforce duple cycles fundamental to rock music.} \]

24 A case could be made for this pattern being in 2/4, rather than 4/4. While that might be true of the standard rock beat in its purest form, stylistic variations on the third and/or fourth beat(s) (usually an increase in syncopation) often mark four-beat measures, which are frequently extended into two-bar patterns (cf. Moore 2001: 42).

irregularity, but, in the absence of other information, imposes duple meter. This seems to reflect musical intuition about hypermetrical structure” (Lerdahl and Jackendoff: 101).

Figure 11: Standard rock drumbeat

In rock music, every instrument’s role is clearly defined and rarely changes. Above all, it is the drums’ role to maintain this standard pattern (with limited parameters for improvisation) for the duration of the song, forming a metrical foundation against which the lead instruments—the vocals in particular—can push and pull (Moore 2001: 43, Temperley: 26). It is a “fundamental starting point” that is “familiar to all rock musicians and listeners” (Covach 2001: 38).

In my own experience I have noticed that, when learning a new song, most drummers start with this pattern in its most basic form (shown above), then, after becoming familiar with the material, slowly begin to add variations—usually adjusting the kick drum to match the bass line, embellishing beats three and four, and highlighting dramatic moments with cymbal crashes. Snare hits are sometimes moved slightly off the beat, but the repeated eighth notes in the hi-hat (and/or ride cymbal) almost never change.

The drums are also the most static layer—not only with their pattern, but also in volume and timbre, since they tend to play continuously and are rarely processed beyond recognition the way an electric guitar or keyboard can be. In fact, many audio engineers mix the drums first, since the consistency of their sound and dynamic provides the baseline against which all the other parts have to react.

This static quality can lead to a tuning out of the drums, which become felt more than heard, and function as a background grid to the other rhythmic layers. In this sense, the standard rock drumbeat is comparable to Krebs’ primary metrical consonance, and functions as a “constant frame of reference for metrical perception” (Krebs 1987: 105; 1999: 30). The listener’s
familiarity with standard drum patterns also makes this “tuning out” possible, as shown in “Cups” and “Tonto.” 26 This is not meant to diminish the drums’ role in anyway—on the contrary, it emphasizes the importance of the drums in establishing rhythmic parameters, much the way the edges of a canvas establish the visual proportions of a painting.

The drums’ role in determining meter is especially important when analyzing un-notated music in which metrical dissonance is prevalent. Though all rhythmic levels may appear equally prominent in a transcription, the listener’s deference to the drums provides a “subliminal reference point,” against which other levels can be considered dissonant. This deference will be reflected throughout the transcriptions in Part Two, in which the meter of the drums—with a few notable exceptions—will be considered primary and notated as such.

4.2 Four-Bar Hypermeter

Though by no means unique to rock music (Butler emphasizes its pervasiveness throughout EDM), the grouping of riffs, melodies, and patterns into four-bar units is common enough that, like the standard drumbeat, it operates as a stylistic norm underpinning the metrical structure of most rock songs. 27

Butler notes that hypermeter in common-practice classical music is marked primarily by harmonic progressions and tonal motion, “projecting a clearly defined relationship between the

26 Cf. London 2004: “Inferring a meter…involves matching the musical figure against a repertoire of well-known rhythmic/metric templates…Most listeners have a bevy of metrically familiar templates at their disposal, and in recognizing these commonplace gestures they are readily able to establish metric entrainment” (50-51). The standard rock drumbeat can surely be included among these “familiar templates” and “commonplace gestures.”

(hyper)meter and the harmonic changes." However, EDM, like Battles, is generally harmonically static, with tonal motion limited to one or two measures at most. "Because of this," Butler says,

[EDM] relies more on other kinds of pattern repetition to create a sense of hypermeter, and the units within a hypermeasure are often quite similar to each other...Although the metrical position might still be very clear at any given moment...qualitative distinctions between measures tend to be somewhat attenuated.

(192)

Battles frequently use four-bar hypermeter to highlight new material and differentiate it amid a dense metrical texture. The familiarity of the four-bar hypermeasure (underscored by changes in dynamics, orchestration, etc.) is used to frame an idea and direct attention to it.28 Four-bar hypermeters can also be present in multiple rhythmic levels simultaneously, or displaced from one another within the same rhythmic level.

To avoid confusion, I will designate antimetrical hypermeasures as "embedded" hypermeasures to indicate both their self-contained quality and their place within a larger, more prominent metrical structure.29 For example, in Figure 6 (reproduced below), Gtr. 2's 3-level

28 Jonathan Pieslak’s “Re-casting Metal: Rhythm and Meter in the Music of Meshuggah” finds similar processes in that band's music as well.

29 Butler implies a similar concept in his analysis of hypermeter in “Doom's Night.” The antimetrical 3-layer, Synth 3 (discussed above), first appears during a breakdown section in measures 25-48. Because it emerges as a solo instrument, and repeats sixty-four times (a duple value), Butler believes that some listeners will interpret this section as sixteen 4/4 measures at a slower tempo, providing an "alternate metrical structure" for Synth 3, relative to the 4-layer measures heard previously (2006: 199-200). I propose that both metrical structures can operate
melody (which only lasts the length of this example) contains exactly four groups (i.e., “bars”) of three quarter notes, each of which is emphasized with an upward leap. (A solid slur marks each “bar,” while a dark bracket indicates the hypermeasure.) Given the prevalence of duple lengths in rock music, it seems likely that many listeners will perceive this as an embedded hypermeasure whose familiar “four-ness” lessens the dislocating effects of the metrical dissonance.  

Figure 12: Battles, “SZ2” (2:55-3:03), embedded four-bar hypermeasure

These four “bars” in the 3-layer also represent the length of one G4/3 cycle, as discussed above. In fact, G4/3 and G3/2 cycles will always contain four repetitions at the 3-level, as shown below.

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simultaneously and that “four-ness” (i.e., pure-duple grouping) in the antimetrical layer is part of its appeal.

Cf. Butler 2006: 193-194, discussing the “importance of ‘fourness’ at multiple levels of organization” in EDM.
Figure 13: Embedded hypermeasures in the 3-layer of G4/3/2 dissonances

It may be argued that the real significance of these moments lies in our perception of this cycle, rather than the embedded hypermeasure in the 3-layer. Yet I believe that, rather than simply being a byproduct of the G4/3 and G3/2 cycles, the embedded four-“bar” hypermeasures are part of their appeal. Evidence for this is the band’s use of embedded hypermeasures in 7- and 5-layers that do not align within a grouping dissonance cycle (in “SZ2” and “TRAS 2”), as well as G4/3 and G3/2 dissonances whose layers begin at different points (“SZ2”). Part Two examines these in greater detail and concludes with examples of displacement dissonance.
PART TWO:
Analyses of Specific Tracks
CHAPTER 5: GROUPING DISSONANCE IN BATTLES

Grouping dissonance in Battles emerges as loops of different lengths are layered over a stable drum pattern—usually some variant of the standard, 4/4 rock beat. G4/3 and G3/2 dissonances are pervasive, but loops in five and seven are also present, as well as compound dissonances with three or more interpretive layers. In most cases the drums provide the primary metrical consonance, although a few notable exceptions exist.

5.1 “Tonto” (from Mirrored)

The intro to “Tonto” demonstrates Battles’ unique approach to layering metrically dissonant loops and ways in which the resulting ambiguity might be resolved (or not) in the listener’s mind. A two-bar, 4/4 melody in Gtr. 1 opens the track with a free tempo that gradually evens out and accelerates into steady quarter notes. During this acceleration it is overtaken by Gtr. 2 playing a 3-layer, sixteenth note pattern at a faster tempo, along with a quarter note pulse in the hi-hat. By the fifth beat Gtr. 1 has accelerated to Gtr. 2’s tempo, creating a G4/3 (quarter=1) / G3/2 (eighth=1) embedded grouping dissonance.

There is no obvious primary consonance at this moment. Some listeners may focus on the 3-layer because of its association with the hi-hat pulse, others may hear that layer as antimetrical because Gtr. 1’s melody is more familiar. Both layers are of equal volume and there is nothing in the hi-hat to emphasize one interpretation over the other.

Because they do not begin aligned, the dissonance cycle does not end after four 3/4 bars. Instead, it takes seven 3/4 bars for the two layers to align—a cycle that also contains two repetitions of Gtr. 1’s melody.

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31 In live performances Ian Williams plays this melody on the guitar and keyboard at the same time using the left-hand-tapping technique described in Part One.
Figure 14: Battles, "Tonto" (0:13-0:45), grouping dissonance

Larger numerals: G4/3 (ν = 1)
Smaller numerals: G3/2 (λ = 1)

accelerates into new tempo
The layers’ alignment at 0:30 also corresponds with the entrance of Gtr. 3 playing a new, 4/4 riff in A minor pentatonic. The introduction of a prominent 4-layer riff at the start of a new G4/3 cycle strengthens the 4-layer in Gtr. 1 and raises 4/4 to primary consonance. This riff continues for six more bars before the displacing entrance of the full drum kit at 0:42—an example of “turning the beat around” that will be examined in detail in the next chapter.

5.2 “Ddiamonddd” (from Mirrored)

“Ddiamonddd” presents a rare instance in which the drums are antimetrical, not the indicator of primary consonance. It is also the only track discussed here featuring vocals in a metrically dissonant texture. The vocals here are brightly mixed, energetic, high in the vocal range, and doubled by a loud electric guitar. It is hard to imagine any drum pattern detracting from that, though the pattern here surely tries its best.

The first half of the track features four short verses, played as below. The vocals and lead guitar play a two-bar melody in 7/4, alternating with an ascending scalar passage in the keyboard that lasts for four bars of 4/4.
Meanwhile, the drums play a jerky and erratic rhythm that bears no discernible relation to the other layers. However, slowing the track down reveals a metrically dissonant 5/8 pattern lasting for three embedded “bars.” Each of the three embedded “bars” begins the same way, but is then subject to a shifting process on the last two eighth notes in which the sixteenth rest of the
first bar moves one sixteenth to the right in each successive bar before returning to its original location.

**Figure 16: Battles, “Ddiamondd,” shifting process in drum pattern**

Such processes are common in the music of post-minimalist composers, such as David Lang. The opening of Lang’s “Cheating, Lying, and Stealing” features a set of short, two-bar variations on an ascending E minor arpeggio that is played in unison by the entire ensemble (except the cello, which plays quarter note triplets). The first variation, starting in m. 5, introduces an eighth rest on the “and” of beat 1 that shifts three eighth notes to the right in each subsequent variation. In each case the eighth note rest splits apart two previously joined eighth notes and extends a 3/8 pattern into 2/4. The bass clarinet from measures 5-10 (variations 1-3) is shown here:\(^{32}\):

\(^{32}\) This is my own engraving. The score only beams quarter-note groupings, but I have beamed the 3/8 and 2/4 groupings to show how the shifting eighth note rest affects the patterning.
The 5/8 drum pattern in “Ddiamondd” creates a G5/2 (eighth=1) dissonance with the 7- and 4-layers, as well as an irregular G4/3 (sixteenth=1) dissonance during the first three eighth notes of each 5/8 “bar.” As an embedded grouping dissonance it also creates G7/5 and G5/4 dissonances at the quarter note level. This embedded dissonance means that, despite the pattern lasting three embedded “bars” at the 5/8 level, repetitions are more likely to be felt every five beats at the quarter note level because of the 7-level’s strong quarter note pulse and the identical beginning of each of the embedded 5/8 “bars.”

The three-“bar” embedded hypermeasure at the 5-level repeats exactly four times within each verse. In “SZ2” such four-ness at the hypermetrical level seemed to indicate deference towards that rhythmic layer. In this track, however, the drums’ 5-layer is so fast, and the pattern so difficult to perceive, that it does not achieve primary consonance and remains a surprisingly de-emphasized layer, structurally speaking. In personal correspondence Tyondai Braxton (who wrote most of the parts for this track, including the drums) said that everything “just so happened [to] line up that way.” That such an alignment could happen without conscious planning is entirely

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33 If drums’ repetitions are perceived at all, which is doubtful.
plausible, though why he liked the result may have to do with the four embedded hypermeasures and their convenient re-alignment at the start of each verse.\textsuperscript{34}

5.3 “TRAS 2” (from \textit{EP C/B EP})

The intro to “TRAS 2” shows the perceptual complexities that can arise from a seemingly straightforward grouping dissonance and the role the listener may have in determining primary metrical consonance. The first sound is an electric guitar processed with a “backwards” effect (Gtr. 2), followed quickly by another, unprocessed guitar (Gtr. 1) and a distorted bass line. Each instrument is slightly louder than the previous one. Gtr. 2 plays a sparse, one-bar riff in 4/4 while Gtr. 1 plays a 5-layer riff whose introduction omits the two A4 sixteenth notes that mark each subsequent iteration. Meanwhile the bass—the most prominent of the three layers—plays a one-bar, 4-layer riff that is displaced two beats ahead of Gtr. 2.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure18.png}
\caption{Battles, “TRAS 2” (0:00-0:23), metrical dissonance}
\end{figure}

\textsuperscript{34} This re-alignment means that there is no cycle shorter than the length of one verse (thirty beats).
There is no obvious primary consonance without the drums present. It is tempting to hold on to Gtr. 2’s 4-layer riff since it presented the initial downbeat, but, then again, Gtr. 1 has a high, catchy riff whose E5 continuously pops out of the texture. In the absence of drums, it is the bass whose resonance dominates the texture and is most likely to assume the primary consonance in 4/4. This results in a perceptual shift whereby the bass assumes the downbeat and Gtr. 2 is displaced two beats ahead. This shift is reinforced by the pickup-sixteenth-to-quarter-note rhythm on the fourth and first beats of the bass riff, which emphasizes that instrument’s recurring quarter note as a downbeat.\footnote{Different listeners may hear the bass assume primary consonance at different points, or perhaps not at all. In this transcription I am assuming that the perceptual shift has occurred by the riff’s third iteration.}

After eight hypermeasures in the 5-layer—two cycles, relative to Gtr. 2’s 4-layer—the texture stops abruptly at 0:23 and a bright, ascending melody is introduced. This leads to the drum entrance at 0:26 and the return of Gtr. 1’s riff, now displaced D10+7 (eighth=1) relative to its
initial appearance. Together Gtr. 1 and the drums repeat their one-bar patterns for one hypermeasure and establish 5/4 as the new primary consonance.

**Figure 19: Battles, “TRAS 2” (0:23-0:32), primary consonance in 5/4**

It is surprising that 5/4 is established as the primary consonance since 4-layers have played a more prominent role in the track so far. Yet, there may be some foreshadowing in the cut off at 0:23 coinciding with the end of the eighth hypermeasure in the 5-layer—a cycle that aligns with the less prominent 4-layer in Gtr. 2, not the primary, 4/4 consonance of the bass (which is cut off halfway through its tenth bar).

The following section, beginning at 0:38, continues the 5/4 patterns in Gtr. 1 and the drums and reintroduces the distorted bass. Like Gtr. 1, the bass line has been displaced—D8+1 (eighth=1), in this case. Starting the bass on the downbeat obscures this by starting an eighth note early, but each subsequent iteration follows this displacement strictly.

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36 There is more on displacement dissonance in this and other tracks in the next chapter.
Figure 20: Battles, “TRAS 2” (0:38-0:46), grouping dissonance and displaced bass line

Yet, just as it did at the beginning of the track, the pickup-sixteenth-to-quarter-note rhythm provides such a strong agogic accent that many listeners are likely to shift their perception and re-hear the bass pattern as starting on its third beat, rather than its first, and quickly re-hear the pattern as it is written below.

Figure 21: Battles, “TRAS 2” (0:38-0:46), alternate hearing of bass line

In its initial presentation this bass riff was prominent enough to assume primary consonance in 4/4. This time, however, the drums have been added to the texture and are supporting Gtr. 1’s 5-layer—so, even though the bass is just as resonant as it was in the intro, the drums maintain their role as the primary indicator of consonance and make the bass sound
antimetrical.\textsuperscript{37} This perception is reinforced by the formal structure of the section, which consists of four hypermeasures in the 5-layer, not the 4-layer.

The following section, beginning at 1:28, is built exclusively of G5/4 (quarter=1) dissonances between the 5/4 drum pattern and new, 4-layer loops in the guitars. The 4-layer bass line and all previous patterns are absent for the rest of the track.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure22.png}
\caption{Battles, "TRAS 2" (1:50-1:55), metrical dissonance in the latter half of the track}
\end{figure}

Despite being outnumbered by 4-layers in the guitars, the drums can, for some listeners, maintain primary consonance in 5/4 through their greater volume and constant articulation of four-bar hypermeasures. Drum fills emphasize hypermeasures at 1:47, 2:11, 2:35, and 2:46, and a solo from 2:53-3:12 lasts two hypermeasures and features prominent 5/8 accents. This solo is followed by a dramatic hypermeasure that marks every 5/4 downbeat with a crashing cymbal. Eventually the 4-layer loops drop out, leaving the drums to play alone for the last two minutes of the track. The metrical ambiguity and tentative 4/4 consonance that opened the track gives way, in the end, to a stark, unambiguous 5/4 consonance.

\textsuperscript{37} Having the bass and drums in different rhythmic layers is very unusual for rock and EDM.
5.4 “SZ2” (from *EP C/B EP*)

“SZ2,” track seven from *EP C/B EP*[^38], is one of Battles’ longest and most formally complex tracks, with twelve distinct sections separated into two large halves that divide the track at 5:38.[^39] Part One begins with a freely played guitar riff (Pre-Intro) that gradually accelerates into a more formal Intro at 1:56. The Intro is marked by the entrance of an eighth note pulse in the sleighbells and a gradual layering of guitar riffs that are metrically inverted by entrance of the drums and bass at 2:38 (an example of “turning the beat around,” described below). This leads directly into the A section, in which several short melodies and riffs are layered in ever-changing ways over the standard rock drumbeat. Following a metrically dissonant Interlude at 3:27, the A section returns at 3:49 with a new melody in the bass.[^40] The B section at 4:52 begins with a sudden thinning of the texture, followed by a layering of triplet-based riffs, including tension-building eighth note triplet attacks in the kick drum.

The transition into section C / Part Two[^41] consists of one—or possibly two—metric modulation(s) leading to a double time breakbeat[^42] pattern in the drums and metrically dissonant

[^38]: This “album” is actually two EPs released as a compilation that also included the single “TRAS.” Both EPs were initially released in 2004 on separate labels, with *EP C* preceding *EP B* by three months. The band’s current label, Warp Records, released them together as *EP C/B EP* in 2006. The track ordering is different on the compilation than the separately released EPs—“SZ2,” for example, appears as track one on *EP B*.

[^39]: A complete transcription of “SZ2” can be found in the Appendix.

[^40]: This melody returns at the end of Part Two in an electric guitar. In the transcription it appears augmented, but, because of the tempo change at 5:38, it is actually heard at the same speed.

[^41]: Like all of these formal terms, “Part Two” is my own designation, though this one is consistent with live performances of the track on YouTube, which are predominantly of Part Two only and are usually labeled as “Part Two” by the video’s owner.
guitar loops in the 3-layer. Compared with Part One, the loops in Part Two are brought in and out at predictable, four-based intervals, with formal subdivisions marked by improvisatory drum fills. The alignment of loops is more rigid, suggesting an overt EDM influence in keeping with Part Two’s dance club energy; yet the math rock component is never lacking, particularly in the brief 3/4 Interlude at 7:07 and the compound grouping dissonances in sections D and E, which include layers in five and seven—values foreign to EDM, in which metrical dissonance is based exclusively on duple and triple-conflicts (Butler 2006: 164). The return, in section E, of the bass melody from 3:49 thematically connects Part Two with Part One, as does the continued D Dorian tonality and minor third-based riffs and melodies.

Like the other tracks under discussion, “SZ2” is remarkable for its seamless blend of EDM-style looping and layering techniques with the timbres and metrical complexities of math rock. The music relies heavily on electric guitars and live drums, and subtle inconsistencies in performance and tone leave no doubt that the music is played by living, breathing performers—unlike the mechanized precision of EDM programming. The distorted guitars and crashing cymbals place it firmly within the rock genre, as do the blues-rock inflections of the Pre-Intro riff. Like math rock, it is entirely instrumental and built mostly of small, repetitive riffs.

Yet there are also remarkable similarities with the metrical dissonance Mark Butler has identified in EDM. Grouping dissonance, in particular, is a prominent feature of “SZ2.” It is present throughout Part One and there is rarely a moment in Part Two without at least one antimemetrical layer. It appears most frequently as a hemiola (G3/2), but 7- and 5-layers also appear in the final minutes of the track.

42 “Breakbeat” is an EDM term describing “drum patterns sampled from the percussion-only sections, or ‘breaks,’ of old funk records” (Butler 2006: 78). Unlike other EDM patterns, breakbeats are made by sampling, and then accelerating, live drums, rather than building a percussion track with separate, electronic layers. This style has, in turn, inspired drummers to imitate breakbeats in their own patterns.
Figure 23: Battles, "SZ2," formal diagram—Part One

<table>
<thead>
<tr>
<th>TIME</th>
<th>SECTION</th>
<th>DESCRIPTION</th>
<th>DISTINCTIVE MOTIVE / RIFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
<td>Pre-Intro</td>
<td>slow tempo, moves between 3/4 and 4/4, builds and accelerates</td>
<td><img src="image1" alt="Motive/RIFF" /></td>
</tr>
<tr>
<td>1:56</td>
<td>Intro</td>
<td>sleighbells, layering of guitar riffs, abrupt drum entrance at 2:38</td>
<td><img src="image2" alt="Motive/RIFF" /></td>
</tr>
<tr>
<td>2:41</td>
<td>A</td>
<td>introduces primary melodies, G4/3 dissonance with Gtr. 3</td>
<td><img src="image3" alt="Motive/RIFF" /></td>
</tr>
<tr>
<td>3:27</td>
<td>Interlude 1</td>
<td>G4/3 dissonance with bass and drums, new melody in Gtr. 1</td>
<td><img src="image4" alt="Motive/RIFF" /></td>
</tr>
<tr>
<td>3:49</td>
<td>A’</td>
<td>return of primary melodies, new four-bar melody in bass</td>
<td><img src="image5" alt="Motive/RIFF" /></td>
</tr>
<tr>
<td>4:52</td>
<td>B</td>
<td>sudden thinning of texture, new melodies in Gtr. and Kbd.</td>
<td><img src="image6" alt="Motive/RIFF" /></td>
</tr>
</tbody>
</table>
### Figure 24: Battles, "SZ2," formal diagram—Part Two

<table>
<thead>
<tr>
<th>TIME</th>
<th>SECTION</th>
<th>DESCRIPTION</th>
<th>DISTINCTIVE MOTIVE / RIFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:38</td>
<td>Transition</td>
<td>metric modulation(s?)</td>
<td><img src="image" alt="Motive" /></td>
</tr>
<tr>
<td>5:45</td>
<td>Intro</td>
<td>faster tempo, prominent G4/3 dissonance between Gtr. 1 and drums</td>
<td><img src="image" alt="Motive" /></td>
</tr>
<tr>
<td>5:52</td>
<td>C</td>
<td>3-layer melody in Gtr. 2, new melody in Kbd. and Bass</td>
<td><img src="image" alt="Motive" /></td>
</tr>
<tr>
<td>7:07</td>
<td>Interlude 2</td>
<td>shift to 3/4, elided riffs in Gtr. 1 and drums</td>
<td><img src="image" alt="Motive" /></td>
</tr>
<tr>
<td>7:22</td>
<td>D</td>
<td>palm muting, G7/4/3 dissonance with Gtrs., Kbd., and drums</td>
<td><img src="image" alt="Motive" /></td>
</tr>
<tr>
<td>7:42</td>
<td>E-1</td>
<td>G7/5/4/3 dissonance, repeats 4x</td>
<td><img src="image" alt="Motive" /></td>
</tr>
<tr>
<td>7:54</td>
<td>E-2</td>
<td>new Gtr. 2 melody (same as A` bass melody), repeats 4x</td>
<td><img src="image" alt="Motive" /></td>
</tr>
</tbody>
</table>
Chapter 3.1 presented the example below, showing embedded grouping dissonance at both the quarter note (G4/3) and eighth note levels (G3/2), and discussed the possibility of a four-“bar” hypermeter in the 3-layer and that this embedded hypermeasure, inherent to G4/3 and G3/2 dissonances, may be part of the appeal of these metrical conflicts.

**Figure 25:** Battles, "SZ2" (A: 2:55-3:03), embedded grouping dissonance and embedded hypermeasure in 3-layer

![Image of musical notation](image)

This 3-layer melody returns four more times in Part One, each time with slight variations in pitch content and metrical placement. Its next appearance, at 3:08, begins on beat three and ends on beat two, twelve beats later. This entrance, two beats late relative to its introduction at 2:55, appears to be a response to the distorted bass riff that entered six beats earlier. This bass riff has been heard two times before, but in each case was only four beats (one measure) long.
The two beat extension here delays the 3-layer’s second appearance, though the grouping dissonance relationships, and embedded hypermeasures, are left intact.\footnote{Subsequent appearances at 3:52, 4:18, and 4:29 are all aligned with downbeats, but are displaced hypermetrically from a new, four-bar melody in the bass. I will return to this in the next chapter.}

\textbf{Figure 26: Battles, "SZ2" (A: 3:04-3:21), second appearance of 3-level melody}
Part Two (5:38-end) is divided into three subsections (C, D, and E), each of which features a different grouping dissonance. Section C (5:52-7:07) is built on a prominent G4/3-G3/2 embedded dissonance, composed primarily of a 4/4 breakbeat in the drums and a 3-layer melody in Gtr. 2. This melody grows out of an ostinato that begins in Gtr. 1 at 5:38 and is gradually thickened with 3-layer guitar loops. In fact, from 5:45-6:37, the drums are the only layer in 4/4. If that were true of any other instrument one might be tempted to re-write this section in 3/4, but it is doubtful that even the most radical listener hears this section in anything other than 4/4—such is the deterministic role of the drums.

However, the intro into C is far from clear. Section B ends with sixteenth-note triplet patterns in all of the instruments. There is a slight crescendo and increased activity in the kick drum pattern before a cymbal crash and a cadence on the tonic, D. As the noise fades away, Gtr. 1 enters with a repeated D4 in what sounds like a faster tempo—perhaps an outgrowth of the increased triplet attacks in the kick drum at the end of B. After six attacks Gtr. 1’s D4’s are doubled by the toms nine more times before the breakbeat enters at 5:45.

By internalizing the beat through the cadential bar, a listener could hear the D4 and tom attacks as dotted eighth notes, and their repetition, in the absence of other metrical reference points, suggests a metric modulation from dotted eighth notes to quarter notes. There is nothing

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44 This is an example of what Krebs calls “indirect dissonance,” since it creates a G4/3 (sixteenth=1) dissonance relative to the previous measure, but is juxtaposed rather than overlaid (hence “indirect”) (1999: 45). It is also comparable to the “breakdown” section in EDM tracks, in which the bass drum is removed and layers are subject to timbral manipulation before the bass drum’s inevitable return (Butler 2006: 91-92). For example, Azzido Da Bass’ “Doom’s Night” (discussed in Chapter 3.1) introduces the metrically dissonant Synth 3 as a solo instrument during the breakdown, just like Gtr. 1 in this section of “SZ2.” Butler writes, “The length of this passage suggests that the producers wanted the synth to seem as consonant as possible at first”
to indicate meter other than the entrance of each successive layer, although the distance between the tom and breakbeat entrances (six beats and nine beats, respectively) suggests triple meter.

**Figure 27: Battles, "SZ2" (5:38-5:47), one metric modulation, grouping dissonance**

This metrical structure is overthrown by the drum pattern at 5:45, which creates an untenable G8/3 (eighth note triplet=1) dissonance. Our perception might immediately shift this dissonance into a 4/4 consonance, against which the D4 attacks are now heard as dotted quarter notes, creating a G4/3 dissonance. As a result, the drum pattern initiates a second metric modulation, this time from quarter notes to dotted quarters.

**Figure 28: Battles, "SZ2" (5:38-5:47), two metric modulations, grouping dissonance**

(2006: 199). Likewise, Battles seems to intend for this ostinato at 5:38 to sound "as consonant as possible at first" as well.
Since the tempo at 5:45 is twice that of section B (ca. q=160), some listeners might hear 5:38 as simply a shift into double-time, in which case the D4 attacks will be heard as dotted quarter notes from the very beginning. Once again the absence of a metrical reference point means that only the addition of the toms provides any structural division and each attack will be heard as an independent entity.

Figure 29: Battles, "SZ2" (5:38-5:46), one metric modulation

Almost every live performance of “SZ2” begins with this “5:38” moment (i.e., Part Two) and drags it out for several minutes before the breakbeat enters—much longer than the album version. Dragging this section out means that the D4’s are set up as a reference beat for much longer before the drum pattern enters. Also, since live performances usually exclude Part One, the listener has no context for the opening tempo, thus nullifying it as a metric modulation. In fact, the audience can often be seen nodding their heads and dancing to the D4’s pulse and then speeding up their movements when the drumbeat enters, which implies the perception of two distinct, consecutive tempi. This observation reinforces a “two metric modulations” analysis, since the band clearly views 5:38-5:45 as an independent section with a unique tempo whose


46 In live performances, the D4 attacks often begin slowly and gradually accelerate over the course of several minutes.
length has been compressed on the album, but which is open to extended development in live performances.

The new breakbeat tempo continues for the rest of the track, while the G4/3 dissonance initiated by the D4 pulse becomes an important structural layer from which a new, 3-layer melody emerges in Gtr. 2 at 5:52 (section C).

Figure 30: Battles, "SZ2" (C: 5:52-6:00), embedded grouping dissonance and embedded hypermeasures in 3-layer

This prominent 3-layer melody is composed of two embedded hypermeasures, which together have a significant role in structuring this section of the track. The chart below shows the organization of these embedded hypermeasures throughout section C. All of the formal divisions (marked by the addition of new textural layers) follow some duple repetition of embedded
hypermeasures, with most textural shifts happening after four repetitions (two complete statements of the melody). Drum fills mark section breaks before 6:07, 6:22, and 6:37.

**Figure 31: Battles, “SZ2,” organization of embedded hypermeasures in section C**

<table>
<thead>
<tr>
<th>TIME</th>
<th>DESCRIPTION</th>
<th># EMBEDDED HYP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:45</td>
<td>Drums enter</td>
<td>2</td>
</tr>
<tr>
<td>5:52</td>
<td>Gtr. 2 enters</td>
<td>4</td>
</tr>
<tr>
<td>6:07</td>
<td>Gtr. 3 enters</td>
<td>4</td>
</tr>
<tr>
<td>6:22</td>
<td>Gtr. 4 enters</td>
<td>4</td>
</tr>
<tr>
<td>6:37</td>
<td>Keyboard and Bass enter</td>
<td>8</td>
</tr>
</tbody>
</table>

One four-“bar” embedded hypermeasure at the 3-level will always equal three bars at the 4-level, so each embedded hypermeasure also marks one cycle of $G4/3$ dissonance. However, “four-ness” and duple organization play such a strong role in rock and EDM that these new embedded hypermeasures may be enough to shift the metrical gravity away from the drums and toward a $3/4$ hearing of this section. One might even hear this section in $6/4$ because of the fast tempo and the alignment of embedded bars’ downbeats with strong beats in the drums’ 4-layer.47

This emphasis on embedded hypermeter is further supported at 6:37 by a new melody that is passed between the keyboard and distorted bass. This new melody is also comprised of two hypermeasures, each of which is twelve beats long, suggesting four embedded “bars” in the 3-layer (i.e., more embedded hypermeasures). However, the strong bass entrance on the next downbeat suggests a stronger alignment with the 4-layer than the 3-layer. This alignment means that the new melody is built of two, three-bar hypermeasures in the 4-layer, rather than the four-

47 This alignment is emphasized by the drum fills before 6:07 and 6:37, which last six beats, starting on beat three and lasting one-and-a-half measures, rather than a typical one-bar fill.
bar hypermeasures we have seen so far. The unusualness of this arrangement, with three-bar hypermeasures in the 4-layer, suggests a desire to strengthen the 3-layer melodies in the guitars at the expense of four-ness in the drums’ 4-layer.

Figure 32: Battles, "SZ2" (C: 6:37-7:07), three-bar hypermeasures in new 4-layer melody

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48 It is also possible to hear the melody as 7/4 + 5/4 (4+3+2+3).

49 Even so, four repetitions of this melody are marked halfway by a drum fill at the end of the second repetition. This drum fill also marks the division between the first group of four embedded hypermeasures in the 3-layer and the next group of four—“four-ness” once again playing a significant structural role.
At 7:07 the metrical weight finally shifts to 3/4. Even the drums are in three, although G4/3 dissonance is implied by two-bar interjections in which the previous material is elided. Small letters in the example below show how the previous, four-beat drum pattern is squeezed into two 3/4 bars by removing the fourth beat of the pattern (“d”) in the first measure, and the first beat of the pattern (“a”) in the second measure. The D4 ostinato, which was metrically dissonant throughout Section C, is now the consonant layer.

Figure 33: Battles, "SZ2" (Interlude 2: 7:07-7:10), elision of rhythmic layers
This shift to 3/4 is short-lived, however. After fourteen brief measures a fast, snare-heavy drum fill reintroduces 4/4 against the familiar 3-layer ostinato in Gtr. 1. The following section, “D,” compounds the grouping dissonance by adding a new 7-layer riff in what is either a keyboard or a heavily processed guitar. The 3-layer ostinato continues, but, because it began eight beats earlier, does not align with the 4- and 7-layers on the downbeat at 7:22.

Figure 34: Battles, "SZ2" (D: 7:22-7:42), compound grouping dissonance
Like the 3-layer melody in section C, the new 7-layer riff plays a significant structural role in this section and, once again, the fast tempo affects how the hypermetrical structure is perceived. For example, it is very difficult to feel the riff in 7/8, though that is, in fact, how it repeats (see dashed slurs in the transcription above). The downbeat of the second 7-layer “bar” on beat four—a weak beat—obfuscates this embedded downbeat as well, so that a listener is

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I use “riff” here, as opposed to “melody,” because there is less pitch content and contrast in this line compared to the 3-layer melody from section C.
likely to identify beat three of the fourth measure—a strong beat—as the first repetition of this 7-layer riff.  

Assuming that most listeners hear the riff in groups of seven quarter notes (rather than seven eighth notes), I have marked each of these with a slur and consider each an embedded “bar,” as I have done with the previous 3-layers. Four of these “bars” once again constitutes an embedded hypermeasure and is marked with a bracket underneath. The 7-layer repeats two embedded hypermeasures before dropping out for the last two bars of the section. The first G7/4 cycle ends on the seventh measure of the section, coinciding with the start of the second embedded hypermeasure and the first moment where all three rhythmic layers are aligned.

Given the perceptual strength of these cycles and embedded hypermeasures, one might wonder why the section does not end at 7:39 with the second cycle / embedded hypermeasure instead of continuing for eight more beats. The answer lies in the 4-layer, whose primary consonance is articulated by the muted guitars and drums. The entire section would only last fourteen 4/4 measures if it ended at 7:39—an uncommon length in both rock and EDM. Continuing for two more measures adds a sense of balance to the 4-layer, from which the listener is getting most of their metrical and structural information. It also, conveniently, allows the 3-layer to re-align at 7:42, on the downbeat of Section E. Once again a two-bar drum fill marks the sectional division.

Section E, the last of the track, is divided into two subsections, which I have designated “E-1” (7:42-7:54) and “E-2” (7:54-8:04). The entire section repeats four times without variation.

E-1 contains the densest grouping dissonance of any Battles track so far. The 7-, 4-, and 3-layers all continue, with the addition of a new 5-layer riff in Gtrs. 2 and 3. Like the 7-layer (now in yet another electric guitar), the 5-layer riff divides symmetrically at the eighth note level, though the fast tempo makes this hard to hear.

[51] Even after countless hearings, I often interpret the riff as 8+6/4—such is the effect of metrical placement relative to the drums.
Figure 35: Battles, "SZ2" (E-1: 7:42-7:54), compound grouping dissonance
Once again embedded hypermeasures play a structural role, though this time it is the new 5-layer, not the 7-layer, that determines the section’s length. E-1 lasts for two embedded hypermeasures in the 5-layer, while the 7-layer is cut short after the fourth beat of its sixth “bar”—less than halfway through its second hypermeasure (parentheses indicate layers that are implied but not realized). This cut draws attention to the new 5-layer riff, and away from the 7-layer, which has already been heard. Cycles in layers other than G5/4 (i.e., G7/5, G7/4, G7/3, and G5/3) have no impact on the form, since the 7-layer is cut short and the 3-layer overlaps into E-2.\(^{52}\) Battles seem to consciously decide which cycles will be significant and how those cycles will affect the overall form.

At E-2 the texture thins out and re-emphasizes the G4/3 dissonance that has characterized the track. A displaced (D3+1, quarter=1) version of the 3-layer ostinato is put forth by another guitar, though it is varied by having a C4 on the second attack. This ostinato is

\(^{52}\) The 3-layer ostinato is particularly quiet in section E, but close listening and comparisons with live performances indicate that it does, in fact, continue.
presented alongside a brief, eight-bar melody in the 4-layer that remains unresolved until the fourth and final repeat.  

Figure 36: Battles, "SZ2" (E-2: 7:54-8:04), grouping dissonance

53 This 4-layer melody is the same as the bass melody that begins at 3:49. Though in the transcription it appears augmented, the tempo change at 5:38 means they are identical.
Unlike section C, embedded hypermeasures in this 3-layer do not play a structural role until the final repeat. The first three repetitions focus on the two hypermeasures in the 4-layer and the 3-layer’s last two beats are altered to accommodate this—just as the 7-layer was forced to adjust at the end of E-1. However, on the last repeat the 3-layer ends right at the end of its second hypermeasure, with a sharp break before the cadential D. This break makes for a satisfying ending, one whose resolution has been harmonically, metrically, and structurally delayed through the previous repetitions.

So far, all of the examples from “SZ2” have presented the drums as the primary consonance, and, except for the brief interlude from 7:07-7:22, the drums have always been in the 4-layer. Chapters 3 and 4 described how, because of their greater volume and resonance, the drums in both rock and EDM function as a metrical reference point for listeners. There is, however, one section in “SZ2” in which the drums are not the primary consonance: The Interlude at 3:27 begins with a new 4-layer riff in Gtr. 1, while the bass and drums shift to a triplet-based, 3-layer pattern. Though a listener would normally defer to the drums for metrical reference, the hypermetrical structure here favors the 4-layer, not the drums and bass’ 3-layer. Gtr. 1’s riff is

\[\text{54} \quad \text{The drum pattern here is actually a skewed version of the disco-style beat in Section E, with its characteristic kick–hi-hat–snare–hi-hat alteration.}\]
grouped into two-bar hypermeasures and four repeats of this hypermeasure form the entire length of the section. The drum and bass' 3-layer, however, plays for ten embedded "bars" (two-and-a-half embedded hypermeasures) and must adjust on the final two beats in order to align with the downbeat at 3:49 (A')—just as it does at the end of E-2. One might feel more pull toward 3/4 if the drums had shifted to a 3-layer pattern earlier in the track, but 4/4 has been so well established by this point that it is not difficult to maintain it as a primary consonance during this brief interlude.

Figure 37: Battles, "SZ2" (Interlude 1: 3:27-3:49), drums (and bass) outside primary consonance
5.5 “Rainbow” (from Mirrored)

Previous examples of grouping dissonance in Battles have featured short riffs, four-bar hypermeasures, and clearly articulated drum patterns. The largest two-layered cycle was shown in “Ddiamondd” (thirty beats long) and the largest from a compound dissonance cycle was found in “SZ2,” at section E-1 (7:42), with a G7/5/4/3 dissonance whose cycle lasts four hundred and twenty beats (though it is never allowed to play out for that long).
The following excerpt, from “Rainbow,” features the most complex grouping dissonance yet, G49/19, whose cycle is nine hundred and thirty-one beats long. Gtr. 1’s nineteen-beat melody has been heard since the beginning of the track, first in augmentation and then, beginning at 0:49, as written below, followed by a gradual accumulation of textural layers that climax with the excerpt shown here.

**Figure 38: Battles, “Rainbow” (2:09-2:40), grouping dissonance**
Gtr. 1’s melody and metrical structure (4+4+4+3+4/4) have dominated the first two minutes of the piece, yet here the greater volume of the keyboard line allows it to claim primary consonance for itself.\textsuperscript{55} This line is broken into three phrases that are thirteen, sixteen, and twenty beats long, respectively. The additive pattern would be more consistent if the last phrase were nineteen beats long, so that each phrase added three beats, but this would have created a displacement dissonance with the 19-layer (D19+10, quarter=1), which seems to have been deliberately avoided.

Although this dissonance creates the longest cycle in Battles’ discography, it cuts off at 2:40—barely 10% of the way through. The 49-layer in the keyboard plays twice, while the 19-layer in Gtr. 1 plays five times before cutting out for the last three beats of the section. The duple repeat of the 49-layer and cutting out of the 19-layer support an interpretation of the keyboard line as the primary, 49/4 consonance.

The section following this begins with a displacement of the Gtr. 1 melody and so I will use that as a pivot point into the final chapter of this paper, analyzing displacement dissonance in Battles’ music.

\textsuperscript{55} This line is doubled in unison by the snare and other keyboards which are not shown here.
CHAPTER 6: DISPLACEMENT DISSONANCE IN BATTLES

6.1 “Rainbow” (from Mirrored)

In Battles, displacement dissonance—two or more layers of the same cardinality offset from one another—often appears alongside grouping dissonance. In “Rainbow,” this moment occurs at 2:40, immediately after the G49/19 dissonance discussed above. Here, Gtr. 1’s metrical structure (4+4+4+3+4/4) reasserts primary consonance after ceding it to the 49-layer in the previous section.

Figure 39: Battles, ”Rainbow” (2:40-3:03), displacement dissonance

Gtr. 1, however, is displaced relative its previous iterations, and begins on the fifth beat of its pattern, as shown in the small staff above. Instead, the metrical structure is taken up by a

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This displacement can almost be explained by the three beats of rest preceding this section: If one imagines the melody as a loop that is muted for those three beats (as is common in EDM, cf.
new keyboard melody whose fifth measure, a whole note F4 in 4/4, contains a drum fill on its first three repeats, but is dropped entirely on the fourth repeat, aligning evenly with the end of the displaced Gtr. 1 layer—as though the band was aware of the metrical displacement and made a conscious decision to end this section in deference to Gtr. 1’s rhythmic layer.

6.2 “TRAS 2” (from *EP C/B EP*)

“TRAS 2” contains several examples of displacement dissonance. The first occurs between the 4-layers in Gtr. 2 and the bass. The bass begins its 4-layer pattern with a sixteenth-note pickup onto Gtr. 2’s third beat. However, the strength of this attack, and the greater resonance and volume of the bass, causes a perceptual shift whereby Gtr. 2 quickly sounds displaced, rather than the other way around.⁵⁷

Butler 2006: 92-93) Gtr. 1 would start here on the fourth beat of its pattern. Instead it starts on the fifth beat.

⁵⁷ Again, this perception is subjective and will vary from one listener to another. A “radical” listener might feel this switch immediately, while a “conservative” listener may not hear it at all.
Displacement happens again at 0:26, where the drumbeat entrance coincides with Gtr. 1’s 5-layer riff re-entering with a D10+7 (eighth=1) dissonance (relative to its initial patterning). Asterisks below indicate the pattern’s inception point in the measures before 0:26.

Figure 41: Battles, “TRAS 2” (0:15-0:31), indirect displacement dissonance

Krebs describes dissonance like this, resulting from juxtaposition rather than superposition, as “indirect”:

When two noncongruent interpretive layers x and y, or two nonaligned congruent layers are juxtaposed, the listener inwardly continues the first layer as the second begins, so that there arises a brief but clearly perceptible conflict between the mentally retained first layer and the actually sounding second layer. The actual duration of indirect dissonance varies from passage to passage and from listener to listener. If the second layer persists, it will likely erase the memory of the first and
hence dissolve the indirect dissonance after a few pulses. (Krebs 1999: 45)

While this accurately describes the return of Gtr. 1 at 0:26, the effect is slightly obscured for two reasons:

First, all of the previous layers have dropped out for four beats, which means there is no immediate comparison between the displaced and non-displaced versions of the Gtr. 1 riff. If even one of the other layers had continued (Gtr. 2, for example), the new, displaced version could be more easily compared to the non-displaced version. Instead, this four beat interruption wipes the slate clean and resets the listener’s perception of the riff.\(^{58}\)

The indirect displacement dissonance is also obscured because the drums enter at the same time. I have argued that the drums can have an overriding influence on our metrical perception, so that layers aligned with the drums automatically feel metrical, and those against the drums feel dissonant. In this case, having the displaced version of the riff enter with the drums lends it metrical validity and can make it hard to imagine ever having heard it another way.

These points aside, most listeners are likely to feel some perceptual shift at 0:26, and the persistence of the displaced riff, reinforced by the drums, will almost certainly “erase the memory of the first and hence dissolve the indirect dissonance after a few pulses.”

---

\(^{58}\) If these four beats were a literal suspension of time, the riff would re-enter on its fifth beat, not the “and” of beat two.
This analysis assumes that the riff initially enters at the beginning of its pattern, which may not be every listener’s experience. One might instead hear it beginning with the E’s on the “and” of beat two or beat four. In this case the indirect dissonance at 0:26 “turns the beat around” and moves those E’s from offbeats to onbeats. Like EDM, repetition allows the listener to enter the metrical dissonance from many different perspectives and have a direct role in formulating their own experience with the material.

The bass re-enters four bars after 0:26 and is also indirectly displaced relative to its previous iterations. The figure below charts the various ways in which the same bass line—which is otherwise unchanged—might be perceived during the first forty seconds of the track. Asterisks track the pattern’s initial quarter note rest through the three displaced versions. Arrows show the displacement from one version to the next.

**Figure 43: Battles, “TRAS 2,” indirect displacement dissonance in bass**

![Figure 43: Battles, “TRAS 2,” indirect displacement dissonance in bass](image)

In each section one’s perception of the bass’ pattern can shift two beats in deference to the quarter note E-B dyad—first at 0:05 and again at 0:41, due to a sixteenth note pickup that
helps emphasize it as a downbeat.\footnote{Cf. Chapter 5.3, p. 42.} It is also interesting to note that the indirect displacement between the 0:05 and 0:38 versions of this bass riff (D8+1, eighth=1) is much smaller than it is between the 0:00 and 0:26 versions of Gtr. 1 (D10+7, eighth=1). That Battles decided to displace the riffs at all is interesting and unique, but that they displaced each instrument’s riff by different amounts reveals an attention to detail that keeps the loops from becoming overly familiar too early in the track.

\section{6.3 “SZ2” (from \textit{EP C/B EP})}

In addition to the examples of grouping dissonance analyzed in the previous chapter, “SZ2” also contains many examples of displacement dissonance, including what Butler calls “turning the beat around,” in which a listener’s perception inverts so that beats map onto offbeats, and vice versa.\footnote{A complete transcription of “SZ2” can be found in the Appendix.}

In E-2 (7:54), a displaced version of the 3-layer ostinato is presented in Gtr. 3, varied slightly with a C4 on the second attack. The combination of these layers presents the dissonance D3+1 (quarter=1), relative to Gtr. 1’s ostinato.
Figure 44: Battles, "SZ2" (7:52-end), displacement dissonance

SECTION E-2
Larger numerals: G4/3 (/= 1)
Smaller numerals: G3/2 (3 = 1)
“SZ2” also contains the only example of “backwards” displacement, as opposed to the “forward” displacements presented so far. The keyboard introduces a D2 drone at 1:55, bridging the Pre-Intro with the Intro proper, which begins at 1:56. This drone then shifts between A1 and D2 on the fourth beat of every other measure and stays misaligned until section A (2:41) where the pitch changes every other downbeat.

This displacement is a “backwards” dissonance because it enters alone, before the other layers at 1:56, and continues to alternate pitches ahead of the downbeat. Following Krebs, this is indicated with a minus sign, rather than the plus signs used so far: D4-1 (quarter=1) (Krebs 1999: 35). It is not, however, resonant or prominent enough to persuade us that its attack represents the downbeat, especially considering the greater volume of Gtr. 1, the sleighbell entrance on the downbeat of 1:56, and Gtr. 3’s entrance off the downbeat at 2:14.
Displacement dissonance can also be found at the hypermetrical level. Previous examples have shown four-bar hypermeasures occurring simultaneously at the 3- and 4-layers (i.e. grouping dissonance), but hypermeasures of the same length can also be misaligned from one another. The next two figures compare the hypermetric structure of section A (2:41-3:27) with its return, A’, at 3:49. Each box represents one bar in the primary consonance. Vertical lines running through the graph group the hypermeasures.
Section A has a straightforward form that is sixteen bars long, built of four four-bar hypermeasures—a common arrangement for rock and EDM. A descending sixteenth note line in the keyboard enters on the second beat of the first hypermeasure. The second hypermeasure contains Gtr. 2’s 3-layer embedded hypermeasure (see Chapter 5.1, Figure 15), which returns offset in the third hypermeasure because of a two-beat extension in the bass. This shift overlaps into the fourth hypermeasure, in which an accented triplet melody (Melody B) is introduced for the first time. The descending keyboard line returns on the second bar of the fourth hypermeasure, cutting out for the last three beats to allow the last note of Melody B to ring. Despite the idiosyncrasies towards the end, it is easy to feel section A in four-bar hypermeasures and the overall length has a familiar “four-ness” about it.

But when A returns at 3:49 the hypermetric structure is more opaque. The total length is twenty-two bars—which already indicates a shift away from the “four-ness” of its previous appearance. In addition to the patterns from A, there is a prominent new bass melody that reappears in Gtr. 2 at the end of the track (section E-2, discussed above). This new bass melody is four bars long, with a 2+2 phrase structure whose consistency forms a convenient reference point for the displacement that occurs.

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61 For simplicity I am assigning both of these melodies to “Gtr. 2,” although they do not seem to be the same instrument on the recording.
Figure 47: Battles, "SZ2" (A': 3:49-4:53), hypermetric structure (see Fig. 48 for transcription)

<table>
<thead>
<tr>
<th>3:49</th>
<th>4:07</th>
<th>4:18</th>
<th>4:29</th>
<th>4:44</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr. 2</td>
<td>Melody A</td>
<td>Melody B</td>
<td>Melody A</td>
<td>Melody A</td>
</tr>
<tr>
<td>Kbd.</td>
<td>Desc. 16ths</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bass 1</td>
<td></td>
<td>Triplet Pattern</td>
<td>Triplet Pattern</td>
<td></td>
</tr>
<tr>
<td>Bass 2</td>
<td>4-Bar Melody</td>
<td>4-Bar Melody</td>
<td>4-Bar Melody</td>
<td>4-Bar Melody</td>
</tr>
<tr>
<td>Dr.</td>
<td>Standard Pattern</td>
<td>With Gtr. 3</td>
<td>Triplet Pattern</td>
<td>Triplet Pattern</td>
</tr>
<tr>
<td></td>
<td>Hypermeasure</td>
<td>Hypermeasure</td>
<td>Hypermeasure</td>
<td>Hypermeasure</td>
</tr>
</tbody>
</table>

This displacement begins in the second hypermeasure. The descending keyboard line begins on the second bar of the hypermeasure, as it did in A, but Melody B begins on the third bar—one bar late, relative to its previous appearance at 3:18. The descending line, formerly three bars long, extends to four bars in order to end with Melody B, despite overlapping into the first bar of the next hypermeasure. Because the drums also follow Melody B, our sense of hypermetric structure shifts one bar to the right, aligning with the onset of a louder triplet pattern in the bass and drums at 4:17. Melody A begins on the second bar in the next two hypermeasures, as it did in the first one, and the triplet patterns become the new reference point, making Bass 2 hypermetrically dissonant with the other layers (D-1, one bar\(=1\)). The triplet patterns drop out for the final hypermeasure, where once again the keyboard line enters on the second bar and Melody B enters on the third, extending the hypermeasure by one bar and cutting off Bass 2 halfway through its melody before the section ends at 4:53. A’ is transcribed in its entirety below.
Figure 48: Battles, "SZ2" (A': 3:49-4:54), hypermetric displacement

SECTION A'

Gtr. 1

Gtr. 2

Gtr. 3

Bass 1

Bass 2

Kbd.

Dr.
The metrical structuring of A' reflects Battles’ fluid approach to repetition, in which loops are sometimes allowed to float easily amid a dense texture, despite the metrical dissonance that may arise. Their use of short, often one-bar, riffs enables this fluid approach, as does a static, yet
tonally flexible, harmonic language (D Dorian / A Aeolian, in this case). The textures built with these short ideas can then be overlaid with longer melodies, such as Melody A and B and the Bass 2 melody, that help provide a larger structure.

Such structuring can also lull the listener into a false sense of complacency, from which they might be suddenly and violently torn. Such is the case with the displacement dissonance at 2:38, immediately preceding section A. Here the drums and distorted bass enter on the “and” of beat three with a pounding triplet pattern lasting for eight eighth notes, creating a D8+5 (eighth=1) dissonance with the guitars.

Figure 49: Battles, "SZ2" (2:34-2:42), displacement dissonance

This entrance is so overpowering, and the syncopation it creates is so disorienting, that our sense of downbeat immediately shifts to align with the bass and drums, moving the D8+5 (eighth=1) dissonance to Gtrs. 1 and 3, where it stays throughout Part One. This shift is especially notable in Gtr. 3, whose one-bar pattern previously consisted entirely of offbeat attacks, but which now articulates every beat.
This perceptual shift is an example of a displacement dissonance process Mark Butler calls “turning the beat around” (2006: 141). As described in Chapter 3.2, “turning the beat around”
involves several distinct features, including the abrupt entrance of “an additional textural layer that results in a new metrical interpretation” and the “transformation of a seemingly clear downbeat into an offbeat and vice versa” (2006: 144). Its appearance near the beginning of the track as part of a “gradual buildup of the texture” is typical for the process.

It is also common for the reinterpreting layer to be in the drums, which once again serve as the primary metrical reference point, despite two and a half minutes of a completely different downbeat. Even if an extremely conservative listener were not convinced by the bombastic entrance at 2:38, the shift to a standard rock drumbeat at 2:41 would solidify the downbeat shift, especially since this shift is aligned with a strong bass keyboard attack on the tonic, D.

Considering what happens at 2:38 it is worth looking at the sleighbell entrance at 1:56. There are two tracks of sleighbells, one in each channel. The first, sleighbell 1, enters the right channel on the downbeat, the second enters the left channel on the “and” of beat three, creating a D8+5 (eighth=1) dissonance with the other layers—the exact same dissonance as the beat-turning bass and drum entrance at 2:38. Although this displacement is otherwise unmarked for the rest of the Intro, its inexplicable appearance at this point of the track suggests a foreshadowing of the dramatic moment to come, and a hint of behind-the-scenes manipulations and formal experimentation. I would speculate that, in early versions of “SZ2,” there was no “turning the beat around,” and the Intro was metrically aligned with the rest of the track (with sleighbell 2). A (purely speculative) later decision to “turn the beat around” may have led Battles to add a second track of sleighbells (sleighbell 1) to reinforce Gtr. 1’s downbeat at 1:56 and make the beat displacement at 2:38 even more startling.

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62 This is the same keyboard line shown as an example of “backwards” displacement above (see Figure 43). Notice that one eighth note is dropped from the sixteen-eighth note line in order to synchronize with the downbeat of section A (2:41).
6.4 “Tonto” (from Mirrored)

“Turning the beat around” is also a distinct feature of the intro to “Tonto,” though the process is more subtle and slippery than its appearance in “SZ2.” However, like “SZ2,” it appears toward the beginning of the track, “in association with a gradual buildup of the texture,” and fulfills all of the distinct traits Butler ascribes to the process, particularly the “transformation of a seemingly clear downbeat into an offbeat and vice versa” (2006: 144). Unlike “SZ2,” the displacement in “Tonto” occurs amid layers of embedded grouping dissonance (described in Chapter 5.2), which means that the dislocating effect is felt across multiple rhythmic levels.\footnote{Butler finds a similar displaced embedded grouping dissonance in James Ruskin’s “Connected” (2006: 171-172).}

The 4- and 3-layers first align at 0:30, coinciding with the introduction of a new, 4-layer riff in Gtr. 3.\footnote{See Figure 14, p. 34, last measure of the second system.} This cycle should end three bars later, but, because of the two-bar hypermeter in Gtr. 1, it takes twice that long and does not re-align until the downbeat at 0:43. The hi-hat attack on beat two of this measure is a louder, open hit, followed by a snare hit on the “and” of beat two,
and a closed hit on beat three. These three eighth note attacks serve as a pickup to the displaced drum pattern that follows—a variant of the standard rock drumbeat in which the hi-hat attacks, previously heard as onbeat pulses, are suddenly transformed into offbeat hits.

**Figure 52: Battles, “Tonto” (0:43-0:48), "turning the beat around"**

Though not as dramatic as the bass and drum entrance in “SZ2,” the subtlety of this moment allows us to actually feel the other layers shift into their new metrical positions. While the “SZ2” entrance changed everything in a blinding flash of light, the effect here is more akin to a “Magic Eye” 3D image.
The displacement dissonance, formerly D8+5 (eighth=1) in the drums, moves to the 4-layers in Gtrs. 1 and 3 as D8+3 (eighth=1). The Gtr. 1 melody, formerly onbeat quarter notes, becomes entirely off the beat for three-and-a-half measures before switching to repeated eighth notes, the second of which is on the beat and accented, fighting its own displacement and emphasizing the new metrical consonance. This post-displacement section lasts for eight bars before Gtrs. 1 and 2 drop out at 0:59, leaving Gtr. 3 and the drums to repeat their one-bar patterns eight times before the vocals enter at 1:08. Dissonance cycles seem to be of no concern, since both Gtr. 1 and Gtr. 2 are cut off halfway through their patterns. Gtr. 3, however, continues to play its displaced pattern through the cutoff point and quickly ceases to sound displaced at all.
Figure 54: Battles, "Tonto" (0:44-1:08), post-displacement re-alignment
Following the release of *Mirrored* in May 2007, the band released “Tonto” as a single that includes two remixes of the song by prominent EDM DJ-producers, as well as a live recording from the 2007 Fuji Rock Festival titled “Live at FRF 07.” Given the metrical complexities of the song, it is worth looking at what variations exist in live performances, as well as how other musicians—DJ's in particular—have handled the material.

In addition to “Live at FRF 07,” many live versions of “Tonto” exist on YouTube. One in particular, “battles-tonto-live in dublin,” is notable for its high audio and video quality and for a particular performance feature that I will return to shortly. Both “Live at FRF 07” and “battles-tonto-live in dublin” share traits that point to the difficulties of turning the beat around in a live performance.

In both versions Ian Williams’ intro extends much longer than on the album and makes fewer attempts to synchronize with the other layers. Tyondai Braxton plays Gtr. 2 (the 3-layer)

http://www.youtube.com/watch?v=I5T1rmbwnI0
and communicates the opening tempo to drummer John Stanier by nodding his head to a quarter note pulse while playing muted sixteenth notes on the guitar. This pulse is then played on the hi-hat when Braxton and Stanier enter together, just as it is on the studio recording.

Dave Konopka enters next, playing the 4-layer Gtr. 3 riff. In “Live at FRF 07” this happens after sixteen bars in the 3-layer (i.e., four hypermeasures), in “battles-tonto-live in dublin” he begins after twelve bars (three hypermeasures). Surprisingly, in both live recordings Konopka enters with the displaced version of the riff, not as it is initially heard on the album.

Figure 55: Battles, “Tonto,” Gtr. 3 entrance on album (0:30), compared with live entrance / displaced album version

The reason for this becomes clear watching live performances online: he has to loop the riff in order to play other layers. Though he could have entered with the original riff and started looping on the “and” of beat two, the timing of this would have been incredibly difficult, especially amid the pressures of a live performance. He has to ignore the noise of the crowd, Williams’ free

66 There is no consistent amount of time before this entrance. It seems to depend mostly on whether all of the gear (volume levels, tuning, pedals, etc.) is ready.

67 This coordinated entrance can be seen more clearly in “Battles – Tonto” (http://www.youtube.com/watch?v=Q0iPFqgsLU8) and “Battles – Tonto – Live @ Johnny Brenda’s June 15, 2008” (http://www.youtube.com/watch?v=UweZ1K98zqg)
tempo meanderings, the 3-layer dissonance in Gtr. 2, and not confuse the hi-hat pulse for the actual beat.

This last part is so difficult, it seems, that drummer Stanier helps Konopka with kick drum attacks showing where the beat is. On “Live at FRF 07” this begins after eight 3-layer embedded “bars,” while on “live in dublin” it enters after only four 3-layer embedded “bars.” Stanier’s intent seems to be solely to aid Konopka and not to turn the beat around, since, on “live in dublin,” the kick drum drops out once Konopka enters, and on “Live at FRF 07” it is almost inaudible. This difference in volume may simply be a matter of microphone placement, but considering that, unlike “live in dublin,” “FRF 07” was professionally mixed for public release, it seems likely that the band would have raised the drums’ level if they considered the kick an important element, and they may even have deliberately lowered the volume in order to hide this bit of behind-the-scenes coordination.

Figure 56: Battles, “battles-tonto-live in dublin” (0:28-0:51), turning the beat around
It seems that, in live performances, *Gtr. 3* is meant to turn the beat around, not the drums. In fact, when the drums do enter with their full pattern, the moment is much less exciting than on the album version. This is mostly due to the beat having already been turned around, but also to the comparatively square way in which the live intros are structured, with greater emphasis on duple lengths, particularly before the Gtr. 3 and drum entrances. “Live at FRF 07” repeats Gtr. 2’s 3-layer sixteen times (four embedded hypermeasures) before Gtr. 3 enters, “live in dublin” repeats it thirty-six times (three embedded hypermeasures); the album version, in contrast, repeats Gtr. 2’s riff a non-duple seven times. Once it has entered, both live versions repeat the Gtr. 3 riff eight times (two embedded hypermeasures) before the drumbeat enters, while the album repeats it a less predictable six times plus two-and-a-half beats.

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68 At 1:12 on “Live at FRF 07” and 1:00 on “battles-tonto-live in dublin.”
Figure 57: Battles, "Tonto," section lengths for intro in live and album versions

<table>
<thead>
<tr>
<th></th>
<th>GTR. 2 TO GTR. 3 ENTRANCE</th>
<th>GTR. 3 TO DRUM ENTR.</th>
<th>DRUM ENTR. TO CUTOFF</th>
<th>CUTOFF TO VOCAL ENTR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Live at FRF&quot;</td>
<td>16 x 3-layer (48 beats)</td>
<td>8 x 4-layer (32 beats)</td>
<td>20 x 4-layer (80 beats)</td>
<td>4 x 4-layer (16 beats)</td>
</tr>
<tr>
<td>&quot;live in dublin&quot;</td>
<td>12 x 3-layer (36 beats)</td>
<td>8 x 4-layer (32 beats)</td>
<td>16 x 4-layer (64 beats)</td>
<td>4 x 4-layer (16 beats)</td>
</tr>
<tr>
<td>Album version</td>
<td>7 x 3-layer (21 beats)</td>
<td>6 (+ 5 eighth notes) x 4-layer (26-and-a-half beats)</td>
<td>8 x 4-layer (32 beats)</td>
<td>8 x 4-layer (32 beats)</td>
</tr>
</tbody>
</table>

Though it is not uncommon to draw out a song’s intro for a live performance, it is likely that these specific formal changes reflect a need to more easily coordinate the song in a live setting, where it can be difficult to hear and communicate with one another—especially since Gtr. 3 could just as easily have entered after an eighth repeat on the album version and the drums could have started their pattern on the downbeat of the twenty-seventh repeat of Gtr. 3’s riff, rather than the middle of the bar. Given that the album version predates these live recordings, it seems that specific decisions were made to move the beat-turning moment away from the drums and instead to Gtr. 3 in live performances, and to square off the form into duple-based lengths to make it easier to internalize during a performance.69

69 This is a typical distinction between rock and classical music: in the latter, an ideal performance includes every note played in a precisely described manner, whereas rock (and especially EDM)
This “squaring off” is also the approach taken by Four Tet\(^{70}\) in his “Tonto” remix, which focuses largely on the Gtr. 3 riff. There are only fifteen seconds in the nine-and-a-half minute track in which the riff is not playing, usually as a processed, EDM-like bass line, and always in its displaced form, never as it initially appears on the album. The percussion layers consist mostly of the four-on-the-floor bass drum with hi-hat syncopation pattern discussed in Chapter 3.2—the displaced hi-hat on the album being relegated to a more prosaic EDM role. When he does bring in the original drum pattern, as a sample at 6:04, it has absolutely no displacing quality to it whatsoever, but simply reinforces the Gtr. 3 riff and the four-bar layering typical of the genre.

The Field’s\(^{71}\) remix takes a completely different approach—to the extent that, for the first half of the track, it is difficult to recognize “Tonto” in it at all. Several layers of distorted keyboard\(^{72}\) set up a dense, syncopated groove, doubled by a sparse hi-hat layer. The patterns here are repetitive enough to suggest 2/4, rather than 4/4, with an unaccented downbeat in the first measure.

At 0:15 a kick drum enters with steady, offbeat attacks. Based on our analyses so far, this seems to be a D4+1 (eighth=1) dissonance that should—because it is happening in the low drums—immediately turn the beat around. However, the balance between the keyboards and drums is such that even radical listeners might remain unconvinced by this entrance and continue to hear the downbeat with the low B’s in the keyboards and the kick drum as offbeats, as below. The keyboard is much louder, with a fuller sound and stronger bass presence, while the kick tends to approach music as a series of patterns and riffs that can be freely extended or altered under different circumstances.

\(^{70}\) Kieran Hebden, British post-rock and electronic musician.

\(^{71}\) Axel Willner, Swedish electronic producer and musician currently based in Berlin.

\(^{72}\) Reduced to two for easier viewing in the transcription below. Kbd. 1 is mostly in the right channel, Kbd. 2 is in the center.
drum is comparatively thin and mixed slightly to the right. Heard this way, the kick drum is not a displaced layer, but a simple syncopation.73

**Figure 58:** Battles, "Tonto (The Field Remix)" (0:00-0:53), displacement(?) in kick drum

Yet this perception is dogged by an anomaly in the keyboard patterns: harmonic and textural changes happen on offbeats, rather than downbeats. The first change happens at 0:30 (Figure 58, fourth bar of first system) with increased activity in the hi-hat, a pattern shift in Kbd. 1, and a harmonic change and melodic fragment in Kbd. 2. Yet there is a slight hiccup with all of these changes happening off the beat in what is otherwise a square, duple-based form. This hiccup happens again with the return back to section one, at 0:38 (second-to-last bar of second

73 Krebs would say otherwise, as discussed in Chapter 2.2.
system). Except for these anomalies, the form is a typical duple-based structure with sixteen bars preceding the kick drum entrance, sixteen bars with the kick drum, and eight bars of section two before both sections repeat—all the more reason that changing these sections on offbeats, rather than downbeats, seems peculiar.

However, if the kick drum turns the beat around at 0:15, these structural anomalies disappear. Section two begins right on the downbeat at 0:30 (fourth complete bar in Figure 59, below), following sixteen bars with the kick drum, and section one returns on the downbeat at 0:38 (second system, last bar). The shift into section two is even emphasized by an additional sixteenth-note attack on the downbeat that does not occur in the three repeats that follow.

**Figure 59: Battles, "Tonto (The Field Remix)" (0:00-0:53), turning the beat around**

These two sections alternate for the remainder of the track, although the turned-beat perception becomes difficult to maintain because of our strong desire to hear the low B's in Kbd. 2 as the start of their pattern, rather than the "and" of beat two—despite the pattern having begun
with the D’s in measure one, rather than the B’s. Yet textural shifts beginning around 3:29 subtly support the inverted-beat perception, including a shift in the hi-hat to emphasis the kick drum, and cleaner timbres in the keyboards. Sections one and two continue to provide the primary material, but begin to alternate more rapidly and are increasingly overlaid with additional layers that fade in and out of the texture. However, it is still possible for a conservative listener to hear the kick drum off the beat right up until the coda at 7:10.

The coda begins following a repeat of section two, when all of the layers (except for an atmospheric pad) drop out and a one-bar guitar sample and offbeat hi-hat layer are introduced. After eight repeats the kick drum re-enters, along with a snare attack on beat two. This bar repeats fifty-nine times, gradually accumulating delay lines in the guitars before fading out. The stripped-down ending is free of metrical ambiguity and retroactively supports an inverted beat perception beginning at 0:15. It is also the only part of the remix that clearly references “Tonto”—the intro, presumably (judging by the guitar sample), which is ironic considering that is the most metrically ambiguous section of the original track, while this coda is the least ambiguous moment of the remix. This suggests that the beat-turning displacement in Battles’ album version inspired The Field to do a similar technique in his remix, especially since both displacements appear at roughly similar places in each track.

**Figure 60: Battles, “Tonto (The Field Remix)” (7:10-8:18), Coda**
Comparing The Field’s use of turning the beat around (and Underworld’s in “Cups”—
Chapter 3.2, Figures 8 and 9) with Battles’ highlights ways in which metrical dissonance functions
differently in a rock band versus a DJ’s laptop. Butler writes:

In styles featuring traditional performance techniques, metrical
dissonance must be executed by a single performer or
ensemble, requiring a cognitive and performative integration that
surely affects the way in which the dissonance is played in
certain subtle but perceptible ways. In electronic dance music,
however, dissonant layers can unfold independently with
absolute precision, thereby exposing a gap between the
mechanistic aesthetic of the music and the ways in which
humans interact with it (Butler 2006: 174).

Battles’ music lives right on the line between the “mechanistic aesthetic” of EDM and the
“traditional performance techniques” of a live ensemble. On one hand, they make extensive use
of looping technologies—even considering them “instruments to master”74—and approach
recording as a creative act in itself, rather than simply capturing a track’s live sound. On the other
hand, they have an exhaustive tour schedule and completely restructure some tracks to make
them easier to perform live on a regular basis.75

EDM has a live component as well, although most DJ performances consist of semi-
improvised remixes of pre-recorded tracks, with an eye toward the set as a complete experience,
rather than trying to re-create individual tracks in real time.76 Also, as the name implies, electronic
dance music prioritizes “danceability,” meaning a steady beat and predictable formal structure.

74 Tyondai Braxton, email to author.
75 “SZ2” and “Tonto” are examples of both of these points.
Interestingly, turning the beat around is rare in live sets, since it would require the beat to be absent for an extended period of time in order for its (re-)entrance to be metrically inverting (Butler 2006: 234). Metrical dissonance becomes an optional component that is quickly discarded if it interferes with the danceability of a set.

For Battles, however, metrical dissonance is a vital compositional element, functioning differently in each track and contributing to that track’s unique sound. Even if it proves difficult in live performance, the band manages the "cognitive and performative integration" to make it work, choosing human fallibility over “absolute precision” (as in “Tonto”). Although the music often has a hard, metallic, sheen, one can continually sense the humans behind the machines, and the alternating struggle against, and acceptance of, technology’s role in our lives today.
CONCLUSION

This paper has examined the creation, function, and perception of metrical dissonance in the music of the contemporary rock band Battles. In doing so I have described the unique ways that metrical dissonance functions in this music and the role of the listener in determining metrical structure in moments of ambiguity.

In Part One I provided background on Battles and the “math rock” label that is often used to describe their style. I also discussed the avowed influence of minimalism, traditional African music, and electronic dance music on the band, as well as the primary feature linking these three styles: pulse-based repetition. I then provided the context for my methodology, which has been drawn largely from the work of Harald Krebs. In particular, I have followed Krebs in organizing my examples into two large categories: “grouping dissonance” and “displacement dissonance,” and have used his term “primary metrical consonance” to describe rhythmic layers that a listener perceives to be metrical. I also drew extensively from the work of Mark Butler, whose Krebsian analyses of electronic dance music were incredibly helpful in demonstrating how metrical dissonance functions in un-notated, loop-based music. From Butler I have borrowed the term “turning the beat around” to describe a displacement dissonance process so intense that a listener’s perception of the beat inverts offbeats to onbeats, and vice versa. I ended Part One with a brief discussion of two rock stylistic norms, the standard rock drumbeat and four-bar hypermeter, and the role each plays in influencing a listener’s perception of meter.

Part Two used original transcriptions to look in detail at moments of metrical dissonance in five tracks: “TRAS 2” and “SZ2,” from EP C / B EP, and “Ddiamondd”, “Rainbow,” and “Tonto” from Mirrored. All of these tracks provided examples of grouping dissonance and only one, “Ddiamondd,” did not appear in the displacement dissonance chapter as well. I also presented both live and remixed versions of “Tonto” in order to examine ways in which turning the beat around is re-imagined in other contexts.

These analyses show that Battles uses metrical dissonance differently from one track to another and even within the same track. “SZ2,” for example, contains both hemiolic and compound grouping dissonance, embedded and displaced hypermeasures, and a startling
example of turning the beat around when the drums enter at 2:38. In “Tonto,” however, the beat is turned around much more subtly amid a layered texture rich in grouping dissonance.

Though the drums were continuously shown to be the arbiters of primary metrical consonance (as they are in EDM as well), that role is briefly abdicated in “SZ2” (at 3:27) and abandoned in “Ddiamonddd.” I also presented metrically dissonant moments in “TRAS 2” and “Rainbow” in which the drums are absent, forcing the listener to use indicators (such as volume and resonance) in other instruments to make sense of the metrical ambiguity. Yet, in the majority of these examples the drums maintain their traditional role as timekeeper and indicator of primary consonance. This role is aided by the listener’s familiarity with the standard rock drumbeat, particularly the inclination to hear kick drum attacks on the beat, hi-hat attacks off the beat, and snare drum attacks on beats two and four—i.e., the “backbeats.”

This paper is, to my knowledge, the first to be written about Battles, and much remains to be said. The confluence of diverse styles in their music is worth exploring further, particularly the connection to electronic dance music and the influence of technology on their creative process. I would also like to investigate the use of metrical dissonance in other genres whose styles are based on pulsed repetition. For example, the idea and function of a “loop” as it appears in electronic dance music, minimalism, and traditional African music and conceptions of meter and metrical dissonance among musicians in these genres.

As a composer who began his musical life as a rock guitarist and songwriter, I was immediately drawn to Battles when a friend introduced me to EP C/B EP in 2007, right before Mirrored was released. The music’s rhythmic and formal complexities satisfied the analytical parts of my brain, while the gritty timbres and visceral punch resonated pleasantly in several regions below the neck. I quickly bought every available recording and researched the band extensively, eventually branching out into Don Caballero and re-listening to Helmet—a favorite band in high school—for John Stanier’s drumming. I ultimately focused on the work of Tyondai Braxton, whose compositional training and public admiration for Stravinsky seemed both refreshing and personally relatable. I eagerly awaited (and thoroughly enjoyed) his solo album Central Market in
2010, and attended both the album release party and large ensemble performance by the Wordless Music Orchestra at Le Poisson Rouge in New York City.

My discovery of Battles coincided with a fervent desire to break down the barriers between classical, composed music and the rock music world from which I sprang. Having discovered “new music” through avant-rockers and electronic musicians such as Sonic Youth, Stereolab, Aphex Twin, and Brian Eno, I was well acquainted with the popular music fringe and eager to explore that edge from the classical music side as well. Several of my works written since then have used explicit rock references, with Battles’ influence always in mind.

The first of these, *THICK SKIN*, features an unusual hybrid ensemble of brass quartet and rock trio (electric guitar, electric bass, and drums), plus amplified bassoon (at the music director’s insistence). I played the guitar part myself and based the first movement—written entirely on the guitar—on a distorted, Battles-like one-bar riff in 7/4:

**Figure 61: Ryan Brown, THICK SKIN, Mvmt. I**

*THICK SKIN* was soon followed by *Extended Family*, for electric guitar and string quartet. The work is subtler than *THICK SKIN*, but a G minor pentatonic riff in the third movement—also in seven—reminded me of the Gtr. 3 riff from “Tonto,” which inspired me to write a backbeat-like part for the cello and to transpose the riff to A (like the “Tonto” riff) at the end of the movement.
More recently, an electric guitar duo composed in the winter of 2012-13 makes deliberate Battles references as a nod to the commissioner’s shared affinity for the band. An open-string, D Dorian riff in the latter half of the piece went into my sketches as the “Battles riff,” and my Battles transcriptions were in mind when I began exploiting the “mixed span” possibilities of the riff in 3/4.

My longest and most ambitious attempt to integrate rock, EDM, and classical influences has been GANGBUSTERS, written for the Paul Dresher Ensemble in 2008-2010 and then drastically revised for performances in 2012. The group, which includes amplified clarinet, amplified violin, keyboard, electric guitar, electric bass, and two electronic percussionists, seemed the ideal ensemble to try my rock-integration experiment on a large scale. Yet, much of what I
disliked about the original version came down to an imbalance between the classical and rock/EDM influences. It felt far too “composerly” and not “Battles-y” enough, which I tried to remedy in the 2012 version, which includes more repetition, steadier drumbeats (including four-on-the-floor), and an increased role for the electronics.

Figure 64: Ryan Brown, GANGBUSTERS

Though I am satisfied with many parts of the score, composing this work helped me appreciate just how elegant much of Battles’ music is, particularly how they make intricate, dense textures from very simple materials; while, in contrast, much of GANGBUSTERS still feels unnecessarily complicated. It also made it clear to me how important both the performers and the composing process are on the creation of a non-classical work. Complexity in Battles often seems to be the result of various contributions from the individual band members and endless tinkering in the studio (as I surmised with “SZ2”); yet a classical composer is expected to deliver a
fully-realized work that, theoretically, any trained musician could perform at any time. This realization has convinced me that the most effective solution is to start a handpicked group of my own in which I function as bandleader and co-performer, welcoming and integrating contributions from the other musicians, and customizing the music to our respective interests and abilities. This has become a top priority that I hope to accomplish in the very near future.

Meanwhile, Battles continues to release new recordings and tour the world. Though their most recent album, *Gloss Drop*, reveals a stylistic turn away from the music analyzed in this paper, the group still seems intent on challenging traditional notions of what rock music should sound like, and I look forward to seeing what the future holds for this innovative band.
APPENDIX:

“SZ2” transcription
PRE-INTRO

\( \text{\( j = \text{ca. 52, played freely} \end{equation}} \)

Guitar 1

\( \text{\( j = \text{ca. 80} \end{equation}} \)

Gtr. 1

\( \text{\( j = \text{ca. 112} \end{equation}} \)

Gtr. 2

\( \text{\( \text{1:17 (processed noise)} \end{equation}} \)

Gtr. 1

\( \text{\( \text{1:21, \( j = \text{ca. 170} \end{equation}} \)

Gtr. 2

\( \text{\( \text{1:27 \text{ (dense textural layers until 1:56)} \end{equation}} \)

Gtr. 2
TRANSITION

INTRO, PART TWO
SECTION E-1

Larger numerals: G7/5/4/3 (λ = 1)
Smaller numerals: G7/5/3/2 (λ' = 1)
SECTION E-2
Larger numerals: G4/3 (μ = 1)
Smaller numerals: G3/2 (λ = 1)

7:54

D3+1 (μ = 1) to Gtr. 1

1.2.3.
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