

Unpopular Meters

**Irregular Grooves and Drumbeats in the
Songs of Tori Amos, Radiohead, and Tool**

by

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Abstract

This dissertation investigates the drumbeat's role in articulating irregular metric structures in rock music from the past three decades. Having analyzed a corpus of 240 songs, I theorize several distinct categories of metric irregularity; establish drumbeat conventions in the most common irregular grooves; explore connections between drumbeat, meter, hypermeter, and form; and present numerous examples of unique or idiosyncratic drumming practices. While explaining metric trends broadly within a historically situated genre, my research also highlights the metric idiolects of Tori Amos, Radiohead, and Tool.

The dissertation comprises three parts. Part I establishes my theoretical position and methodological framework. In Chapter 1, I stress the importance of the snare drum in the mapping of unfamiliar metric terrain: through constant exposure to the backbeat as the standard drumbeat of 4/4 meter, popular music listeners have come to equate snare-drum articulations with a specific metric implication, which informs our interpretation of metrically irregular structures. Chapter 2 establishes a historical and generic context for discussing metric irregularity in recent rock and delineates the boundaries of the corpus.

Part II consists of an annotated catalogue of every repeating metrically irregular drumbeat in the corpus. Cyclic patterns are the essence of metric hierarchy; thus, these grooves are essential to understanding the relationship between irregular meter and drumbeat. Chapter 3 reviews metrically

regular drumbeat patterns other than the backbeat, including the tresillo and various triple and compound meters. Chapter 4 focuses on the two most common irregular meters—quintuple and septuple—each of which bears a distinct relationship to regular metric archetypes and, therefore, reveals a characteristic approach to irregularity. Chapter 5 concerns more complex patterns that arise in larger repeating cycles.

Part III looks at non-repeating irregularities. I theorize three distinct types and discuss idiomatic uses in the music of my core artists in Chapter 6. The simplest isolated irregularities concern a single measure, but some structures affect a whole formal section. Chapter 7 shifts to the analysis of full songs, demonstrating the utility of my theoretical innovations.

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Introduction

The drumbeat is the metric cornerstone of countless rock songs. Indeed, the usual role of the drums, supporting a characteristic 4/4 groove with a familiar backbeat rhythm, is so common that it is often taken for granted. In metrically irregular contexts this familiar drumbeat cannot be replicated, and rock drummers are required to innovate. Sometimes this task is accomplished by adapting the backbeat to accommodate an irregularity—fitting a square peg into a round hole. Sometimes the drums stubbornly retain the backbeat, while irregularity is conveyed by the rest of the band. Other drumbeats depart more radically from familiar patterning, either through destabilizing cross-rhythms or virtuosic episodes. I argue that to understand the diverse structures of metrically irregular rock music it is necessary to understand the conventions that undergird the drumbeat. This dissertation explores how drummers navigate these conventions within potentially inhospitable metric contexts, where the regularity often associated with the standard rock backbeat comes into conflict with different sorts of structural irregularities.

To address the great variety of irregular metric structures employed by rock artists, this project takes the form of a corpus study. Beginning with the studio recordings of Tori Amos, Radiohead, and Tool (three acknowledged masters of metric irregularity) and moving outward to include their contemporaries, I have compiled an eclectic corpus of 240 songs from the past three decades. These songs represent diverse subgenres, ranging from pop-rock to metal, from folk-rock to experimental. Yet they are united by two features—metric irregularity and a drum part. With a corpus of this size, I am able to delineate many trends in how recent rock artists manipulate metrically irregular contexts. Specifically, I theorize several distinct categories of irregularity; establish drumbeat conventions in the most common irregular grooves; and explore connections between drumbeat, meter, hypermeter, and form. At the same time, the corpus is small enough that several examples resist categorization, allowing me to illustrate unique or idiosyncratic drumming practices.

The dissertation comprises seven chapters, grouped irregularly into three parts (two, three, and two). Part I establishes the tension between regularity and irregularity that undergirds this project. I

approach this task from two perspectives. In Chapter 1, I present my theoretical position. I begin with the premise that, through constant exposure to the backbeat as the standard drumbeat of 4/4 meter, popular music listeners have come to equate snare-drum articulations with a specific metric implication—what Christopher Hasty (1997) calls “metric continuation.” Moreover, when listening to metrically irregular rock, this association remains active, informing our interpretation of the irregular structure at hand. I then review the treatment of irregularity in extant theories of meter, arguing that the influence of the drums can encourage the stylistically aware listener to entertain irregular structures precluded by those theories, which are largely rooted in the Euro-American classical tradition. Regularity, both in the articulation of metric structure (via the backbeat) and in a specific cultural practice (the omnipresence of this drumbeat in rock), is foundational in our understanding of irregularity.

Chapter 2 reinforces this same argument while introducing my methodological framework. Review of a sample of songs much larger than my corpus, including the two thousand entries that occupied the top three spots of *Billboard* magazine’s “The Hot 100” from 1958 to 2015, furnishes a historical and generic context for discussing metric irregularity in recent rock. While 4/4 time and foursquare hypermeter are unmistakable norms for all genres of popular music, the historical span of this survey reveals gradual changes in the popularity of metric irregularities through the decades. Drawing on this sample, the catalogues of my three representative artists, and other sources, I introduce the corpus and explore the fuzzy boundaries that define it—these include chronology, genre, instrumentation, and level of irregularity. I conclude with an overview of the most general trends observed in the corpus, based on a rough typology of metrically irregular phenomena and on the hierarchical level at which these occur.

The three chapters of Part II constitute an annotated catalogue of every repeating metrically irregular drumbeat in the corpus, from patterns that span entire songs to localized ideas that receive only a single repetition. Cyclic patterns are the essence of metric hierarchy; thus, these grooves are essential to understanding the relationship between irregular meter and drumbeat. Chapter 3 reviews metrically regular drumbeat patterns other than the backbeat, including the tresillo and various triple and compound meters. I introduce two important strands common to rock drumming in all metric contexts. The first is a preference for Platonic-trochaic successions (as defined by Scott Murphy, 2016), of which the tresillo is a common and elegantly simple example. The second identifies the most typical snare-drum patterns, such as backbeat variants and various triple possibilities, as well as

other common approaches to drumbeat articulation (most common among them what I call *undifferentiated* patterns). Also in Chapter 3, I consider drumbeat patterning among meters with irregularities at the half-note level, which largely favours the backbeat model.

Chapter 4 focuses on the two most common irregular meters—quintuple and septuple—each of which poses unique structural questions. As a result, the ideas introduced in this chapter constitute the core of my thinking on irregular grooves. Quintuple patterns are remarkable first and foremost for their variety, demonstrating that, in the absence of a strong first-order norm (like that offered by the backbeat in 4/4 grooves), both metric structure and drumbeat articulation admit radical flexibility. I close this section with an extended metric and hermeneutic analysis of Tool’s “The Grudge,” which contains over a dozen distinct quintuple patterns. Septuple grooves are more consistent than their quintuple counterparts, a feature I attribute largely to the ways in which they modify the backbeat model. The most common septuple drumbeats adapt backbeat patterning modestly, encouraging the structural interpretation of low-level metric deletion. I conclude the chapter by reflecting on these structural implications.

Chapter 5 concerns more complex patterns that arise in larger repeating cycles. Three cardinalities—patterns of nine, eleven, and thirteen—are common enough to merit independent consideration; other possibilities are rare, leading me to treat them as a group and to theorize them in more general ways. While the drumbeat trends observed in Chapters 3 and 4 are largely echoed in these larger patterns, the structural possibilities become more complex. I posit that a meaningful distinction can be drawn between *punctuated* irregular structures, in which a large-cardinality cycle comprises several sub-cycles, only the last of which differs from the preceding ones, and *split* structures, in which the parent cycle is most intuitively understood as comprising two or more near-balanced parts. The distinction is subtle, but it proves robust; ambiguous examples are relatively rare, though discussion of these aids in clarifying my description of the two types.

Part III looks at non-repeating irregularities, first through the lens of data and typology (Chapter 6), then by integrating these ideas into full-song analyses (Chapter 7). In Chapter 6, I theorize three distinct types of non-repeating irregularity: isolated metric irregularities, by far the simplest and most common; *metric pivots*, a sub-class of isolated irregularity in which a transition between two different grooves involves an overlap, resulting in an apparent isolated irregularity; and inconsistent irregularities, which typically concern full song sections that cannot be satisfactorily explained by isolated and repeating irregularities. Because of the large number of isolated metric irregularities in

the corpus (381), my overview of these examples is parametric, for instance relating trends in drumbeat practice to formal and intraformal structures. I balance this theoretical investigation with discussion of idiomatic uses, focusing especially on the music of my core artists.

Chapter 7 shifts to the analysis of full songs, demonstrating the utility of my theoretical innovations. Tool’s “Schism” allows a summary of the various structures and drumbeats explored through earlier chapters, linking together earlier examples taken from the song while offering an analysis rooted in biographical details surrounding the song’s release. Radiohead’s “Decks Dark” steps outside of the corpus, allowing me to test assertions about the band’s metric idiolect; the song shows how knowledge of a group’s creative proclivities can inform analysis of new works. Finally, Tori Amos’s “Icicle” exhibits many striking irregularities but lacks a drum part that might clarify analysis (for this reason it was also omitted from the corpus). By exploring these irregularities without drums and by suggesting hypothetical drumbeats for one particularly thorny passage, I reinforce the usefulness of the drum kit to metric analysis and raise new questions that must be confronted in its absence.

Part I

Theoretical Background and Methodological Framework

— 1 —

A Backbeat-Oriented Approach to Irregular Rock Meter: Implications and Limitations

Metric irregularity, despite a terminological association with oddity or infrequency, is a prominent feature of many diverse musical traditions. Within music scholarship, the past half-century has witnessed a steadily growing interest in metrically irregular musics and issues of meter in general. By confronting the issues inherent in irregular metrical contexts, we not only illuminate the inner workings of unique corner cases but also develop a better holistic understanding of meter. Rock music is one of the most rapidly growing sites of inquiry within this expanding critical framework: analyses of idiosyncratic rhythmic practices and theoretical work on meter occupy a central place in the burgeoning sub-discipline of rock music theory.

In this chapter I establish a theoretical framework for the analysis of meter in rock music rooted in the opposing influences of regular and irregular metric phenomena. Specifically, I attribute a particular importance to the prominence of the drum kit in most rock recordings both for its role in clarifying a (regular) metric framework in the presence of rhythmic irregularities and for its power to suggest new ways of parsing irregular meters. Following a review of pertinent literature, I briefly treat three preliminary issues: (1) the importance of stylistic competence in understanding rock meter; (2) the use of transcription in representing a music whose texts are recorded media, not scores; and (3) the conceptual relationship between rhythm and meter. I also introduce two rock songs with irregular metric features, OutKast's "Hey Ya!" and Tori Amos's "Spark," which foreground issues central to understanding meter in rock. The body of this chapter consists of two main parts: the first addresses the backbeat, the second metric hierarchy. I argue that the backbeat, because of its ubiquity in rock, is strongly correlated with a regular common-time meter. By contrast, my discussion of metric hierarchy introduces many irregular metric phenomena. I devise a new tabular representation of meter in rock songs that better accommodates songs with frequent irregularities and variations. By way of summarizing metric expectations and irregularities in a rock context, I outline my approach to meter-finding when listening to a rock song.

This dissertation relies on three overlapping bodies of research. The first is foundational theoretical literature on rhythm and meter (Lerdahl and Jackendoff 1983, Hasty 1997, and London 2012). The second is writing on metric irregularity, which typically conceptualizes meter as an additive phenomenon (i.e., by building large metric patterns from small, two- or three-beat units). Theoretical and analytical work on metric irregularity falls into two broad categories: analyses of twentieth-century works (e.g., Van den Toorn 1987, Horlacher 2001, and Roeder 2001, 2004) and theories of the additive nature of meter in diverse musical traditions (e.g., Agawu 1995, Clayton 2000, and Temperley 2000). The third relevant body of literature is analytic writing on popular music, in which increasingly more recognition is given to issues of rhythm and meter. Biamonte (2014) and Attas (2011a and 2015) are the most relevant in this category—Biamonte for her synoptic discussion of rhythmic and metric phenomena as they commonly occur in rock; Attas for her detailed attention to rock meter from an experiential standpoint. Further literature ranges from broad investigations of hypermeter and phrase structure (e.g., Attas 2011b) and studies on the nature of groove (e.g., Zbikowski 2004) to detailed work on individual artists (e.g., McCandless 2013).¹

Although the writings on which I draw represent a diverse spectrum of musics, one of the central assumptions of this dissertation is that understanding any genre (in this case, rock music) engages a distinct stylistic competence.² When we listen to a song we learn about the style and develop expectations for subsequent listenings. Some aspects of rock are unique; some are common to a broader definition of Euro-American popular music; still others are shared by many musical cultures. The claims I make here about rock music are not necessarily generalizable to other musical styles or, for that matter, other genres of popular music. Because a substantial amount of my musical training is rooted in rock and other popular genres, I would describe myself as having a high degree of stylistic competence in rock music. Of course, even this competence does not remove all subjectivity from the varied experiences of rock listeners. Other listeners, including many of the authors on whose work I draw, hear metric phenomena in rock music differently than I do. Moreover, many of the theoretical sources on which I draw are rooted in a classical tradition, which

¹ Given the relative infancy of rock music theory, discussions of relevant metric phenomena often feature in studies devoted mainly to pitch organization or musical form. Form intersects with discussions of hypermeter especially frequently, as exemplified by Spicer (2004). General guides to rock music analysis also treat metric issues; see especially Stephenson (2002) and Everett (2009b). Issues of rhythm and meter are implicit in Everett (1995 and 1997), Van Der Blieck (2007), Temperley (2007, 2011a, and 2011b), Biamonte (2008 and 2010), Holm-Hudson (2010), and Nobile (2011).

² See Moore (2001, 195–98), Hatten (1994, 29–30), and Zbikowski (2004, 289, 295–96). Regarding musical-temporal issues specifically, London (1999, 273) notes that “one may even distinguish meters by style and genre.”

differs markedly from that of rock and popular musics. Throughout this dissertation, I attempt to balance the competing imperatives of rock competence and inherited understandings of meter in other styles and genres.

Before proceeding, I will address the function of transcription in this dissertation. When studying meter, consideration of specific musical examples holds great explicatory value, for it is easier to test our theoretical intuitions through the grounded experience of listening to a familiar song. Because music theory has historically studied notated music, music theorists have found it convenient to explain their thinking by adding annotations to extant scores. When writing about rock music, however, there is seldom a score to add to or, if there is, it is usually written by someone other than the musician or band that originally wrote the song. In order to take advantage of the explicatory possibilities afforded by print media and to circumvent the complications involved in relying on an extant score that is itself a reproduction of a sonic artifact (the recorded song), I have opted to use only my own transcriptions when presenting musical examples in this dissertation.³ Some information is lost in translation—the notes in my transcriptions do not capture every detail of a singer’s inflection, sometimes I use chord symbols and slashes instead of spelling out every note played by the guitarist or keyboardist, and only minimal information about timbre is provided by instrument names.⁴ One musical feature, however, has an entirely different function in my transcriptions than it would in a traditional score: namely, the time signature.

Writers who talk about meter in classical music often caution that the given time signature and the meter of a work are not the same thing.⁵ Christopher Hasty describes the time signature as “a rule that will determine the order of the pulses and their subdivision . . . in prescribed ways” (1997, 5). For obvious reasons, when I place a time signature at the beginning of a musical example, it cannot prescribe anything about the recorded performance to which my example refers. Instead, I use time signatures as *descriptive* tools, to help explain how I hear the music. For example, if I transcribe a song in 4/4 time, I am saying that I hear the quarter notes in my transcription as the

³ Gracyk (1996) is among the earliest proponents of the idea that an audio recording itself constitutes a text. Further issues arise when we consider authorship and the idea that a song constitutes an autonomous “Work” (see Eckstein 2009, Negus 2011, and Moy 2015, among others), but these fall outside the scope of the present work.

⁴ Much of this can also be said of the difference between a classical score and a recorded performance (the difference being that, with classical music, the score is created prior to the recording).

⁵ See, e.g., Cooper and Meyer (1960, 88) and Hasty (1997, 5–6). Danuta Mirka (2009, 10) relates this insight to eighteenth-century writings by Koch and Kirnberger. A straightforward example is Burkhart’s (1994, 4) discussion of a particular type of “4/4 [time] conceived as compounded of two bars of 2/4 time, or 1-2 1-2.”

beat and my ear groups four beats into a measure—a deeper level that is also musically salient.⁶ Because the time signature was not conceived as a descriptive tool, it is an imperfect one for my purposes. Several of my examples could easily be represented in other time signatures. I attempt to draw attention to the limitations of this system when they prove relevant, and to clarify potential ambiguities in my prose. Conveniently, since the music I study exists first and foremost in a sonic form, I am able to provide listening examples excerpted from the source materials, allowing readers to test whether they hear the examples in the way I have notated them.

One final prefatory remark concerns the relationship between meter and rhythm—two concepts that are intimately connected. In most music (including rock), our recognition of a given meter rests upon our perception of a series of rhythmic events; meanwhile, our understanding of these rhythmic events is shaped by our interpretation of an attendant meter. Defining either term thus requires that we already grasp some aspect of the other, placing the two concepts in a mutually dependent relationship. Different authors have drawn theoretical distinctions between rhythm and meter in a variety of ways.

For Grosvenor Cooper and Leonard Meyer (1960, 4–6), musical rhythms are differentiated according to their resemblance to poetic feet, while meter is tied to “more or less regularly recurring accents” (4). For their part, Fred Lerdahl and Ray Jackendoff (1983, 12) distinguish meter from grouping: the latter accounts for the unpredictable deployment of rhythmic events while the former is at first tied to embodied human behaviours (i.e., the wave of a conductor’s baton and the tap of a listener’s foot). Hasty’s work marks a significant departure from earlier writing insofar as he seeks to unite meter and rhythm under a single conceptual banner: “if, in fact, meter is an aspect of rhythm, there should be no opposition and no contradiction” (1997, 5).⁷ Most recently, Justin London (1999 and 2012) negotiates a conceptual middle ground in which meter is both reliant on rhythm and conceptually distinct from it.⁸ London (1999, 271 and 2012, 13) clarifies the notion—implicit in much earlier scholarship—that, whereas rhythm is rooted in phenomenal stimuli, meter is a type of behaviour and thus exists only in the mind. For him, “a meter is a coordinated set of periodic

⁶ This definition implies the existence of metrical hierarchy, a subject that I address in greater detail below. I refer to hierarchical levels in my analyses by referencing durational structures as recorded in my transcriptions (e.g., “half-note level”) or as implied by the given time signature (e.g., “beat level”).

⁷ Hasty might fairly be criticized for merely quibbling over definitions (i.e., what Hasty calls “periodicity” is Cooper and Meyer’s “meter”). Indeed, Hasty notes the importance of accurate definitions in defending his own inclusive use of the term “rhythm” (1999, 280).

⁸ London (1999, 270) clearly articulates the divergence between his view and that of Hasty (1997): “meter and rhythm remain separate and separable aspects of musical structure.”

temporal cycles of sensorimotor attention” (London 2012, 92). Thus, the direction of our attention allows us to differentiate between metric frameworks. Here London would seem to agree with Hasty, who notes the possibility of viewing “meter as a creative act of attention . . . arising from the exercise of our cognitive or imaginative powers” (1997, 30; see also 4–5 and 68–69).

If we accept this understanding of meter as entrainment (attentional behaviour), a crucial question becomes: to what do we entrain? Following a wealth of recent cognitive research into rhythm and meter, London submits that a series of approximate temporal boundaries are involved in directing our attention. Our ability to entrain to periodicities weakens substantially outside of the 100ms–5s range and our preferred tactus (or beat) falls in the 500–700ms range (86–120 bpm).⁹ I would add that a listener’s stylistic competence might focus attention towards idiomatic metric features. Specifically, in rock music the phenomenal salience of the backbeat rhythm often captures our metric attention. While a listener’s attunement to a specific metric hallmark cannot override our preferred range of entrainment entirely, I believe that we can be induced to stretch our perception of tactus outside of the most statistically comfortable range.

“Hey Ya!” (OutKast 2003) serves as a touchstone against which to test our metric intuitions throughout this chapter. Hypermetrically, the entire song is based on the cyclic repetition of a six-measure chord progression (see **Ex. 1.1**).¹⁰ Six-measure units are far less typical than four- and eight-measure units—especially in the funk and hip-hop genres with which “Hey Ya!” (and OutKast more generally) is in dialogue. Complicating matters further, while the song is predominantly in common time, the fourth measure of every cycle is in 2/4 time. The irregularity at the half-note level is more prominent than the unusual hypermetric unit length not only because of its proximity to the musical surface but also because features of the song’s production accentuate the 2/4 measure (note the changes of harmony that frame the measure and the momentary absence of syncopation in the kick drum).¹¹ The exceptional metric features of “Hey Ya!” stand out against a hypothetical metric grid of recursive binary subdivisions, but the song can also be described according to elements of metric

⁹ London (2012, Chapter 2) contains a detailed discussion of these and other relevant figures, supported by experimental evidence. See also Jones (2009), Large and Jones (1999), and Large and Palmer (2000), among others.

¹⁰ Listening examples are collected as Appendix II, a compressed file that can be downloaded separately.

¹¹ An additional factor may be the proximity of the half-note periodicity to our preferred tactus range (as described above)—the quarter note is significantly faster. Tempi in the faster range occupied by “Hey Ya!” are entirely normative within rock genres, supporting my assertion that other factors (including percussive cues and generic norms) can override the usual tempo range for tactus identification.

Example 1.1: Harmonic progression and metric changes in OutKast’s “Hey Ya!” (2003).

uniformity. In “Hey Ya!” half-note spans are consistently assembled in groups of eleven, which constitute the building blocks of the song’s form. While eleven-unit groups are notably irregular in a general rock music context, the same span becomes regular within the context of this individual song.

The metric irregularities of “Spark” (Tori Amos, 1998) are both less predictable and more granular (**Ex. 1.2** presents the intro and first verse of the song). Before discussing the various irregularities, however, simply deciding upon the song’s meter raises questions. I hear “Spark” as having a predominantly compound beat subdivision, a feature that, when coupled with a rather slow tempo (the dotted quarter note in “Spark” moves at about 47 bpm), can suggest a quick triple time to some listeners.¹² Even if we agree that a compound subdivision best describes the meter, are the resulting beats best grouped as duple, quadruple, or even (sometimes) sextuple? On the one hand, the six-beat span of the repeated progression in the intro suggests that a quadruple meter is not the best fit for this song. On the other hand, the verse employs the same harmonic progression over four-beat groups, and rock and pop traditions show a strong preference for quadruple time.¹³ My choice of compound duple time in **Example 1.2** accommodates both four- and six-beat spans, while responding to the slow tempo of “Spark.” Ultimately, though, my choice of metric notation is one of many plausible options.

Having settled on a meter for transcription, my discussion of irregular metric features in “Spark” can be more precise. Several measures of 7/8 time, along with the single measure of 10/8 that closes the first verse, introduce irregularity at a sub-beat level, while the internal pulse structure of these

¹² On an online forum devoted to “discover[ing] things within Tori’s stuff that you didn’t notice before you played it,” user butterfly0fdoom notes “Spark goes between 3/4 and 4/4 at various points,” to which user starlesswinter responds “Isn’t it technically 6/8 and 7/8? I could be wrong, though...” (“Musicians: Your Tori discoveries?” in *toriphorums * A Tori Amos Music & Arts Community*, accessed February 12, 2016, <http://yessaid.com/forum/showthread.php?t=31021>). Online fan forums like this demonstrate the relevance of musical details like metric irregularity to a community of devoted musicians and listeners (an idea supported by Hesselink 2013).

¹³ Some might argue that the six-beat intro groups are best understood as extended quadruple measures.

The musical score for Tori Amos's "Spark" consists of four staves: Voice, Electric guitar, Bass, and Drums. The tempo is indicated as $\text{♩} = 47$. The score begins with a short introduction (measures 1-6) featuring the electric guitar and drums. The first verse starts at measure 7, with lyrics: "She's ad-dic - ted to ni-co-tine pat- ches", "simile", and "she's a- fraid of a light in the dark...". The music includes various time signatures (6/8, 7/8, 8/8, 11/8) and metric shifts. The electric guitar part is prominent, with notes labeled E, C, and D. The drums provide a rhythmic foundation. The score continues through measure 15, with lyrics: "here a' he-ere here ah".

Example 1.2: Intro and first verse of Tori Amos's "Spark" (1998).

irregular measures complicates matters at the beat level. It is difficult to say, for instance, whether a measure of 7/8 functions as an extension of a binary 6/8 beat structure (i.e., 3+4 pulses) or as a three-beat bar (3+2+2 pulses). At the single-measure level, the intro consists of two three-measure groups, whereas, in the verse, measures are grouped in pairs—each supporting a single line of text. Finally, while the first verse contains five lines (two-measure groups), the second verse has only four. At every level, the metric fabric of "Spark" is characterized by some sort of irregularity.¹⁴

¹⁴ I return to "Spark" towards the end of this chapter.

In both songs, meter is more than a convenient temporal lattice to which lyrics, harmonies, timbres, and textures are pinned; rather, the irregularities outlined above are marked for listeners' attention, thus participating in the production of meaning.¹⁵ Listener engagements with metrically irregular songs are complex and multidimensional, and the scope of this project is insufficient to treat the myriad questions that arise. For instance, listener responses are best studied via ethnographic work (e.g., surveys, interviews) or cognitive studies of brain activity, and close readings of musical-lyrical relationships—while present—are reserved for only the most detailed analyses in the dissertation. Instead, I focus on several questions raised by the above examples (and others like them) that require insights of a more technical nature. Specifically, if meter is involved in making music meaningful, how do we define meter in this repertoire and how does our definition inform our understanding of irregularities?

I begin with the backbeat. When present, this rhythmic feature exerts a strong influence on the metrical-interpretive process of a stylistically aware listener. While there exists an overwhelming agreement among scholars and fans of Euro-American popular music that the backbeat is a fundamental feature of this repertoire, I argue that the backbeat is paramount to defining rock meter.¹⁶ After reviewing scholarly literature on the backbeat in rock and pop musics, I consider some potential problems for the status of the backbeat as a first-order metric criterion. I introduce Hasty's projective theory of meter as rhythm, which allows me to model contradictions among instrumental layers in "Hey Ya!" Ultimately, I maintain that the backbeat is more central to rock music—and, thus, less susceptible to destabilization—than competing metric criteria.

The centrality of the backbeat suggests that metric irregularity in rock can be profitably regarded in two categories: (1) irregularities in which the backbeat can be retained (i.e., irregularity at the half note level and deeper), and (2) irregularity that overthrows the backbeat, requiring new definitions of meter (i.e., irregularity at the beat or sub-beat level).¹⁷ The relevance of metric layers to

¹⁵ Regarding markedness and musical meaning, see especially Hatten 1994. Osborn (2016, 2–9) invokes the related concepts of *salience*, which “exists somewhere between the unmarked and the marked” (2), and *ecological perception*, drawing on music psychology (e.g., Margulis 2013).

¹⁶ Regarding fans' understanding of the concept of the backbeat, consider the wealth of mainstream acknowledgement that clapping on beats two and four is preferable to beats one and three (e.g., <https://www.google.ca/search?q=clapping+on+2+and+4>), including a viral video in which Harry Connick Jr. adds a beat in a piano solo, “correcting” the audience’s “sterile” strong-beat clapping (https://www.reddit.com/r/videos/comments/1w13np/annoyed_with_13_clapping_harry_connick_jr_adds_a/).

¹⁷ More specifically, such irregularities must contain changes to metric cardinality while retaining a common pulse. Not all beat- and sub-beat-level irregularities necessarily disrupt the backbeat. A notable example that problematizes the categorical boundary suggested above is the chorus of “We Can Work it Out” (The Beatles, 1965), which features an

understanding this delineation between types of metric irregularity prompts a review of hierarchical models of meter. Conceiving of meter as the interrelation of conceptually discrete layers facilitates the precise description of metrically irregular phenomena; it also raises the question of whether these layers relate according to clearly articulable principles. Indeed, the chief distinctions among theories that model meter as a hierarchy lie in the articulation of the rules that undergird that hierarchy.

Using “Hey Ya!” as a model, I interrogate numerous rule systems, arguing that elements of expected regularity in a rock song shape how we hear irregularities in ways that may not accord with extant metric models.

The Backbeat

Summarizing the widely accepted ubiquity of the backbeat in rock and pop musics, Nicole Biamonte (2014, [6.1]) writes, “the most common drum pattern throughout rock and related genres is a backbeat pattern known as the ‘standard rock beat,’ . . . a quarter-note pattern in 4/4 consisting of a bass (or kick) drum on beats one and three and a snare drum on beats two and four, with the hi-hat cymbals or sometimes the ride cymbal iterating a regular eighth-note subdivision” (see **Fig. 1.1**).¹⁸ The quintessential feature of this beat is the articulation of the backbeat itself (the snare part in the figure). Biamonte (2014, [6.1]) suggests that the prominence of the snare drum in a typical rock soundscape—“registerally, timbrally, and dynamically”—accounts for its key role in the standard rock beat.¹⁹ Lawrence Zbikowski (2004) anticipates this view, stressing the relevance of such phenomenally strong rhythmic articulations to an embodied understanding of meter.²⁰ Even when variation is introduced into this stock pattern, the snare’s placement on beats two and four is the most consistent rhythmic element.²¹ Because of the backbeat’s ubiquity, many authors argue that the

alternation of 4/4 and 6/8 meters. The half-note span is never in question but its subdivision—and with it the presence or absence of the backbeat—is inconsistent.

¹⁸ Biamonte’s (2014, [6.1]) footnote 18 provides substantial support for her claim—most notably Tamlyn’s (1998) dissertation on the statistical prevalence of various accompaniment patterns in popular music from 1954–60 and Mauch and Dixon’s (2012) corpus study of MIDI drumbeats found online (which studied 72,283 unique files).

¹⁹ For Tamlyn (1998, 54–60), the snare is inextricably tied to the backbeat rhythm itself. While Mauch and Dixon allow for other instrumental possibilities (tambourine, hand claps, etc.), the most common patterns noted in their study all show the backbeat rhythm in the snare part (2012, 1 and 4–5, respectively). Also of note in the standard rock beat is the consistent eighth-note pulse in the hi-hats; Osborn (2010) theorizes the function of this instrumental layer as it pertains to irregular meters in math-rock and math-metal genres.

²⁰ Regarding embodiment see also Butler (2006, 113–6) and Middleton (1993). The related concept of entrainment figures prominently in London (2012; see especially chapter 1, 9–24).

²¹ See, for example, kick-drum variants transcribed in Butterfield (2006, [40]–[41] and Ex. 12) and Mauch and Dixon (2012, 4), as well as the alternative instrumentation of Biamonte’s (2014, [6.3]) Example 7. The prominent backbeat

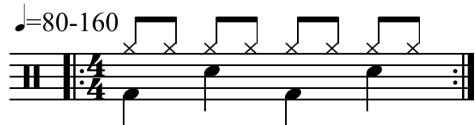


Figure 1.1: Backbeat on beats two and four in the context of the standard rock beat.

apparent contradiction between phenomenal accent and metric accent does not constitute a metric dissonance.²²

Despite the prevalence of the backbeat as a rhythmic pattern, drumbeats are highly individuated in practice. Scholarship on groove addresses this diversity in at least three ways: (1) expressive microtiming, (2) rhythmic variance, and (3) temporal variance. Studies of expressive microtiming consider the exact temporal placement of rhythmic events in relation to a presumed equal spacing of beats in time. For instance, Matthew Butterfield's (2006) study of expressive microtiming in snare backbeats differentiates grooves according to their "engendered feeling."²³ Regarding which beats are articulated (as opposed to the microtiming of those beats), Jeffrey Hennessey reveals the rhythmic variance that characterizes many popular genres in his discussion of the "variable and unique" constitution of groove in individual songs (2008, 137–208; quotation on 207). However, the author also notes that groove-based musics have much in common, including emphasis of the backbeat (2008, 144–6 and 208). Robin Attas (2015) offers a nuanced and holistic understanding of groove as it changes over the course of several buildup introductions.²⁴ Despite the diversity of surrounding beats and the transformation of grooves in time, the backbeat stands out as a stable rhythmic component that transcends these elements of differentiation.

The backbeat's status—as stable metric consonance—suggests a significant distinction. Songs that feature irregularity only at the half-bar level or deeper (e.g., "Hey Ya!") constitute one category,

rhythm is rhythmically, conceptually, and physiologically distinct from so-called ghost notes—syncopated snare articulations at lower dynamic levels that occur in many drumbeats.

²² Butler (2006, 87) writes, "strong phenomenal accents on the second and fourth beats of the measure . . . can be regarded as normative"; Biamonte (2014, [6.2]) describes the backbeat as "an essential component of the meter, functioning as a timeline" and as a "displacement consonance"; and Attas (2014) argues that "a backbeat pattern represents the structural core of a musical piece."

²³ The term comes originally from Keil (1966); also notable is the author's discussion of participatory discrepancies—the microtiming relations that emerge among multiple performers—revisited in Pröger (1995). On the influence of microtiming on groove, see also Gerischer (2006) and many essays in Danielsen (2010), among others.

²⁴ Attas employs Hasty's (1997) theory of projection to treat in detail the shifting metric cues that result from the steady addition of new instruments that characterizes such passages. I return to Hasty's method and recent innovations by Attas and others in greater detail below.

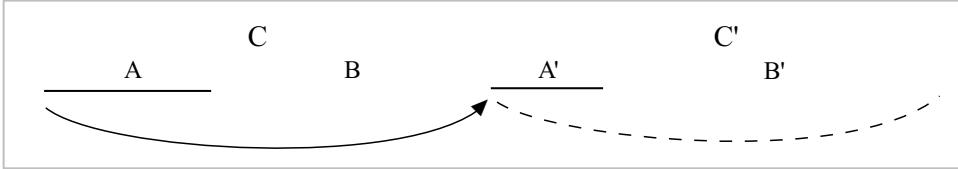


Figure 1.2: Reproduction of Hasty 1997, Example 7.1, illustrating duration C and projective potential C'.

in which the backbeat's metric position is assured. By contrast, in songs with irregularity at the beat or sub-beat level (e.g., “Spark”), the regular recurrence of a backbeat rhythm is impossible. Whether this is in fact a difference in kind, or merely a difference in degree, will prove significant in defining meter in rock music. Before settling this question, however, let us consider rhythmic constructions in which the backbeat is not the only candidate for our metric attention—a discussion that affords a digression on one of the most productive approaches to understanding meter in popular music: namely, the work of Christopher Hasty.

As noted earlier, Hasty (1997) conceptually distinguishes meter from a mechanical measure of periodicity, framing it instead as a phenomenon rooted in the directed attention of the listener.²⁵ This conceptual distinction is made manifest in Hasty’s (1997, 84) definition of *projection* as “the process in which a mensurally determinate duration provides a definite durational potential for the beginning of an immediately successive event” (see Fig. 1.2). The notion that meter is formed from the *projective potentials* of sonic events, as they unfold in time, has influenced much recent work on meter in popular music.²⁶ One attractive feature of Hasty’s projective approach is that it considers every detail of a musical surface. Attas (2011a, 16–17) values this analytical thoroughness because it captures an experiential aspect of listening and dancing that is often overlooked in models of meter.

My projective analysis of the first six measures of “Hey Ya!” highlights the finer points of Hasty’s method and demonstrates its advantages and disadvantages (see Ex. 1.3). In addition to the curved arrows beneath the staves, note the symbols above, representing beginnings (|), continuations (()), and anacrusts (/).²⁷ These projective functions nest hierarchically into durational levels (eighth note, quarter note, etc.). My attribution of different projective implications to different

²⁵ Hasty’s book, *Meter as Rhythm* (1997), offers the most complete formulation of his understanding of meter. His response to London’s review of *Meter as Rhythm* is also notable (both essays 1999).

²⁶ Attas (2011a and 2015) considers popular music in general; Butterfield (2006) investigates rock and jazz drumbeats; and Butler (2006 and 2014) focuses on genres of electronic dance music (EDM).

²⁷ Hasty’s (1997, 105) delineation of beginning and continuation rests on the understanding that the later “continues a process initiated with the beginning of the first sound, . . . with the second sound the duration previously begun [the

The musical score for OutKast's "Hey Ya!" features four staves: Voice, Acoustic guitar, Bass, and Drums. Above the music, projective analysis symbols are placed above each note and rest. The symbols include vertical strokes (|), diagonal strokes (/\), horizontal strokes (—), and various curved and bracketed forms like Q', R, S, D, E, T, U, V, W, and X. The tempo is marked as quarter note = 160.

One two three oh! My ba-by don't mess a-round be-cause she loves me so—and this I know for sho'_____

Acoustic guitar chords: G, C, D, E.

Bass notes: R, S, S'.

Drums notes: T, T, U, U, V, V, W, W, X, X'.

Example 1.3: Projective analysis of the first measures of OutKast's "Hey Ya!" (2003).

instrumental layers follows the method of Attas (2011a and 2015).²⁸ In the present analysis, the acoustic guitar and bass act as an integrated instrumental layer; the analysis of full-measure and multi-measure levels is common to all instruments (see the two uppermost rows of symbols and duration/projection pairs U, V, W, and X).

The details of the projective analysis above draw our focus to several salient musical events. At the shallowest level, most often in the voice, we observe anacrusic events folded into beginnings on the following beats (/→|) and beginnings retrospectively reinterpreted as continuations (|→\).²⁹ One such situation occurs during the count-in, as we approach the downbeat of the first measure. A three-beat count is unusual—the rock four-count is so familiar that it is likely expected by most listeners right up to the downbeat itself, at which point a metrical reinterpretation is required.³⁰ The jarring sensation of this reinterpretation is captured by the interruption of projection Q'; as Hasty

beginning] is still present, active, and expanding." Anacrusis is defined as a type of continuation; Hasty (1997, 122) notes, "the distinction between continuation and anacrusis admits of degrees."

²⁸ In this regard, Attas follows Hasty (1997, 237–95), who employs (at times contradictory) markings in multiple staves when analyzing music of the early seventeenth and twentieth centuries. Issues related to the analysis of multiple conflicting metrical impulses—including human cognition thereof—receive further attention below.

²⁹ Hasty (1997, 138) discusses the theoretical underpinnings for the latter situation; the former is an innovation of Butterfield's (2006, [25]), representing anticipatory syncopation. Butterfield's understanding of such anticipations as reinforcing the underlying meter, rather than destabilizing it, resonates with that of many other authors (e.g., Temperley 1999, Butler 2006, 85–88, and Love 2013, 51–52).

³⁰ The term is Rothstein's (1989); a more thorough discussion of his work comes later in this chapter.

Example 1.4: Various projective interpretations of similar rhythmic cues in OutKast’s “Hey Ya!” (2003): (A) the common rhythm; (B) vocal excerpt (m. 2); (C) guitar strum pattern, and (D) drumbeat.

(1997, 87) notes, “[the projection] will be denied complete realization. But this does not mean that [it] is denied as a potential.” Indeed, the conflict between our feeling of Q' as a potential and the denial of its realization is precisely what we find so jarring. If we parse the count-in differently (say, upon a second listening), we understand the pick-up measure to comprise only three beats.³¹ The resulting beginning, followed by a double continuation (at the beat level), is shown above the staff. Two additional instances of denied realization in the excerpt from “Hey Ya!” occur at S' and X' .

Projective analysis is also useful in illuminating diverse subdivisions of a metric span. Consider the guitar and drum patterns in the 4/4 measures and the vocal rhythm in the second and third measures; analyses of these three instrumental parts reveal nearly identical rhythmic profiles with unique projective profiles (see **Ex. 1.4**). Following a first measure in which the voice clearly outlines a four-beat meter, the articulation of the “and” of beat two (in mm. 2–3) anticipates a strong third beat. The guitar part, mixed to occupy an especially high/bright tessitura (a range typically reserved for the hi-hat), can be interpreted instead as an embellishment of a (3,3,2) tresillo rhythm.³² Finally, the drumbeat is a common variant of the standard rock beat; the normative placement of the snare

³¹ This new parsing will likely require a concerted effort for some listeners; while others, perhaps unfamiliar with the more stylistically normative four-count, may intuit a measure of three beats upon a first hearing.

³² On the tresillo and other clave patterns in rock music, see Biamonte (2014, [6.4]), who stresses the distinction “between clave patterns as surface rhythms, which is their most common role in rock music, and as rhythmic frameworks at a background level, as in many Latin and Afro-Cuban musics” (an observation attributed to Chor 2010a and 2010b). See also Cohn, 2016; I consider the tresillo at greater length in Chapter 3.

backbeat (on beats two and four) overrides the effects of the kick-drum syncopation for most stylistically aware listeners.³³

Contradictions arising between different instrumental layers complicate matters further. Many writers argue that, when music is composed of multiple distinct layers, it is problematic to conceptualize a single metric framework universally applicable to every instrument or voice (even if done flexibly).³⁴ In electronic dance music, as Butler (2006) compellingly argues, the divergence of textural layers often results in ambiguous metric situations.³⁵ Attas (2011a, 43) makes a similar argument regarding meter in rock and pop genres:

In any given listening experience, it is always possible to choose whether to focus on the groove as a gestalt serving as a backdrop to a lead vocal line, or to focus on one of the many instruments or instrumental groupings involved in the groove itself. . . . Part of what makes groove-based popular music so compelling for listeners is the opportunity it presents for a flexible listening experience, and so to insist upon a single, unified metric interpretation of the groove and all of its separate streams would only lead back to the overly general style of analysis I refuted [earlier].³⁶

For Attas, meter is implicated in every detail of the groove, leading to a rich temporal experience. How can we reconcile the competing imperatives of complex rhythmic situations with our assertion that the backbeat is the cornerstone of rock meter?

Before answering that question, a short digression demonstrates the complications provoked by multi-layer textures in the absence of the standard rock beat. Tool’s “Pushit” explores a variety of metric modulations in its nearly-ten-minute span. An excerpt from an extended breakdown near the middle of the song is notable for the regularity of two contradictory layers: the hi-hats on the one

³³ Of course, none of these projective profiles is objectively true—it is easy enough to hear the tresillo rhythm in the vocal or drum parts or to hear the guitar pattern as a duple division of the measure with an eighth-note anticipation of beat three.

³⁴ Two well-developed approaches to this problem, both treating classical music, are Roeder’s (1994, 2001, 2003a, 2003b) theory of pulse streams and Krebs’s (1999, 2006, 2014) work on “grouping” and “displacement” types of metric dissonance (the latter two terms originate in Kaminsky 1989). See also Yeston (1976). More relevant to the present discussion is Nicole Biamonte’s (2014) detailed consideration of the application of various theories of metric dissonance to rock repertoires. See [2.1–2] for Biamonte’s review of Krebs and Butler.

³⁵ In a representative passage, describing Kenny Larkin’s “Track,” Butler states, “rather than hearing a dissonant layer in conflict with a dominant one, we are more likely to hear two clearly incommensurate layers of relatively equal importance” (2006, 136). Butler also expands on Krebs’s work on metric dissonance, introducing two new theoretical concepts: “turning the beat around” (TBA; 2001 and 2006, 141–52) and “embedded grouping dissonance” (2006, 158–66).

³⁶ This quotation follows Attas’s theorization of polyphony in the standard rock beat, including an insightful discussion of textural layers, which she calls “strata” (see 2011a, 31–43).

$\text{J} = 119; \text{J.} = 79$
with delay and chorus

Bass

Drums

tabla samples, etc.; varied and embellished

Example 1.5: Breakdown groove in Tool's "Pushit" (1996).

hand and the bass guitar, on the other (see **Ex. 1.5**).³⁷ Though the regular hi-hat pulse makes it easy enough to entrain to the quarter-note level, this layer is undermined by the dotted rhythm in the bass. My inclination is to hear this bass part as a syncopated cross-rhythm, but it is not difficult to hear the eighth-note pulse as primary. Further complicating matters is an ambiguity of quarter-note grouping. The bass and hi-hats together suggest triple groupings, but the drum samples subvert this pattern with a four-eighth-note cycle. The divergence of pulse layers thus destabilizes any presumed meter. The absence of unambiguous strong and weak beats (or beginnings and continuations) is a central feature of the irregularity of this example.

Compare the metric cues in "Pushit" to those in "Hey Ya!" In the former, the absence of the backbeat leads to a metrically ambiguous situation. In the latter, the consistent presence of the backbeat mitigates any such ambiguity. The projective model reminds us that other textural layers vie for our attention, and thus for our interpretation of the meter. And within this model, the backbeat stands out as a textural layer that receives a great deal of emphasis. I contend that, for a listener familiar with rock music, the meter will always be tied to the backbeat, which brings us back to the question of what to make of other competing layers.

For me, the issue is one of definitions. When other layers of motion appear—and they are ever-present in rock music—they are interpreted against the pulse of the backbeat. These layers are thus not metric, but rhythmic. This is not to imply that rhythmic dissonances are of less importance in shaping the temporal experience of rock listeners. Quite the opposite: in music with a clear metric framework, rhythmic events that pull against the meter are marked for our attention and contribute in important ways to the groove. These complexities and contradictions lie at the heart of Attas's "flexible listening experience." Again, two metric categories present themselves: in the absence of

³⁷ Led Zeppelin's "Kashmir" (1975) is a familiar early instance of this sort of sustained cross rhythm; the groove is discussed by both Moore (2001, 81) and Brackett (2008, 54).

the backbeat, as in “Pushit,” numerous phenomenal cues compete for our metric attention.³⁸ But when a backbeat is present, at least for the purposes of defining and understanding meter, examining every sonic detail can prove unnecessarily cumbersome.

Evidence that rock listeners gravitate to the backbeat is readily available in the work of many analysts, including that of Attas herself. Every example but one in Attas (2015) is notated as though in 4/4 time and, because every drumbeat is a variant of the standard beat, each is analyzed as an alternation of beginnings and continuations (some anacrustic, others not).³⁹ Furthermore, in introducing her first example, Attas (2015, 276) concedes that, although “each individual eighth note is its own duration projected and realized . . . , this level of detail is rarely analytically interesting.”⁴⁰ These features of Attas’s approach reveal that, despite the distinctive rhythmic features uncovered by close projective readings of rock songs, the backbeat emerges as a consistent metric guide. Biamonte (2014) acknowledges this fact implicitly in her categorical separation of metric and rhythmic dissonances. Her section [3] treats rhythmic dissonances at the tactus level; the three examples given are all in 4/4 time, without transcription of the drum parts, the regularity of which is implied by the time signature.⁴¹ The examples of section [4] (“Metric Dissonance”) all involve a change of time signature, prompting Biamonte’s transcription of drum parts in two of three cases.⁴²

The delineation of rhythmic dissonances and metric irregularities, founded on the central role of the backbeat in a stylistically competent understanding of rock meter, brings new focus to my discussion of meter in “Hey Ya!” (refer back to **Exx. 1.3** and **1.4**). The diversity among textural layers illustrated in **Example 1.4** occupies a rhythmic level. The tresillo rhythm in the guitar and bass parts, for instance, sounds a rhythmic dissonance against the metric backbeat. The rhythmic contradictions at the beat level require substantial annotation in the projective analysis of **Example**

³⁸ See Chapter 3 for further discussion of this issue and more examples that explore the tensions between diversity among layers.

³⁹ Attas does not explicitly defend her omission of time signatures from her transcriptions; I assume that she wishes to distance her analyses from any prescriptive metric associations. The exception to the predominance of 4/4 time is Radiohead’s “Sit Down, Stand Up (Snakes & Ladders)” (2003), apparently notated in 2/4 (287). While the half-note bar length aids Attas in describing the metric ambiguities of the song’s first measures, I hear the eventual groove in 4/4.

⁴⁰ See also Attas (2015, n. 13), where she acknowledges the projective force of the half-note level in shaping our understanding of a three-eighth-note anacrusis figure, despite the absence of an initiating pulse.

⁴¹ Indeed, all three songs employ the standard rock beat.

⁴² Ironically, the transcription without a drum part is the most metrically irregular example—Rush’s “Free Will” (1980; Example 4c [4.3]). Biamonte notes that the other two examples are not necessarily irregular: “Tell Me Something Good” by Rufus featuring Chaka Khan (1974; Example 4a [4.1]) allows “an alternative but more counterintuitive hearing . . . requiring no metric adjustment between sections” (this is my preferred hearing of the song), and the irregularity in Steve Winwood’s “Slowdown Sundown” (1981; Example 4b [4.2]) “is rhythmic but only weakly metric.”

The musical score consists of a single vocal line. The tempo is indicated as quarter note = 160. The key signature has one sharp. The time signature starts in common time. The vocal line contains the lyrics: "One two three oh! My ba-by don't mess a-round_ be-cause she loves me so__ and this I know for sho'". Above the staff, vertical bars and brackets group notes into metric units. Chords are labeled G, C, D, and E. The lyrics are aligned with the notes, showing how they fit into the metric structure.

Example 1.6: Simplified projective analysis of OutKast’s “Hey Ya!” (2003).

1.3 and these draw our attention away from the metric irregularity of the example—which is, in its own way, equally stimulating. **Example 1.6** supplies a simplified projective analysis of the song, omitting any annotation below the half-note level and reducing the instrumentation to melody and chord symbols. This new presentation encourages us to shift our focus to questions about meter and hypermeter. Is the downbeat of the fourth full measure perceived as a new beginning or as a deferral of the continuation in the previous measure? How do measures three and four fit into the surrounding hypermeter? Do we perceive the marked asymmetry implied by the deepest level of my annotation (a seven-half-note beginning followed by a four-half-note continuation)? To answer these questions, it will first be useful to familiarize ourselves with several additional theories of meter, in which expectations and conventions of metric hierarchy are laid out more explicitly.

Hierarchy

Hierarchy may be the only aspect of musical meter recognized by all recent theories.⁴³ Several writers argue that hierarchy is a prerequisite of meter; for example: “fundamental to the idea of meter is the notion of periodic alternation of strong and weak beats . . . For beats to be strong or weak there must exist a *metrical hierarchy*—two or more levels of beats” (Lerdahl and Jackendoff 1983, 19, emphasis in original).⁴⁴ Metric hierarchy is also implicated in London’s theory of meter as entrainment. Summarizing cognitive research on human time-keeping abilities, London notes that “the listener’s expectancy . . . can be modulated in complex ways based on the interactions of the component periods of the metric hierarchy. The sense of accent that accrues to the downbeat of the measure is the result of the mutual reinforcement of the component oscillators.”⁴⁵

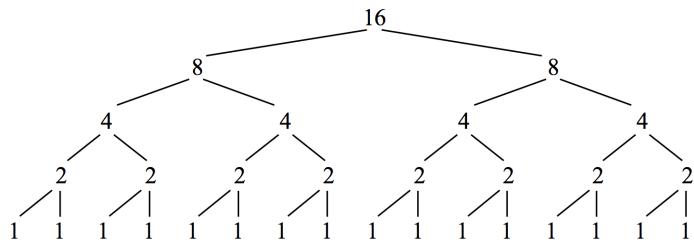
⁴³ See Cooper and Meyer (1960, 2–3), Lerdahl and Jackendoff (1983, 13–21), Hasty (1997, 115–20), Krebs (1999, 22–23), Mirka (2009, 19, 129–30, and 134), London (2012, 15–22), Gotham (2015, [2.2] and [2.5]), and many others.

⁴⁴ See also Yeston (1976, 67) and London (2012, 16).

⁴⁵ In this context, oscillators represent the wave-like ebb and flow of a listener’s expectation of a musical event, based on the perceived strength of an approaching metrical position. Regarding research into metrical cognition, see, for example, Large and Jones (1999), Large and Palmer (2002), and Jones (2009).

A

80
Voice |
Am D/F# Em G Am F Em G
Kar-ma po - lice ar-rest this man he talks in maths he buzz-es like a fridge
13 |
Am D G C Am Bm D
he's like a de - tuned ra - di - o

B

Example 1.7: Comparison of metric annotations of Radiohead’s “Karma Police” (1997): (A) score-based annotations; (B) tree diagram.

Because of the necessity of hierarchical structure in understanding and representing meter, many authors have devised unique analytical markings to depict rather similar ideas about a piece of music.

Example 1.7 presents several influential systems of metric analysis, as they might be applied to the verse of Radiohead’s “Karma Police”—a song that is metrically very regular. The vocal line is accompanied by a standard rock beat (with nominal variation) and by bass, piano, and guitar parts that emphasize the quarter-note beat (see **Ex. 1.7A**). Three different metric annotations accompany

my transcription, including the familiar projective annotations of Hasty (1997; above the staff). Two additional metric analyses are given separately (**Ex. 1.7B** and **Fig. 1.3**).

The second score-based analysis, found immediately beneath the staff, follows Cooper and Meyer's (1960) prosodic annotation. The alternative bracketing at the shallowest (topmost) level shows the rhythmic displacement of the vocal part, while the regular trochaic half-note span represents the instrumental parts.⁴⁶ Whereas Cooper and Meyer typically prefer end-accented hypermetrical structures, the harmonic progression of “Karma Police” supports Stephenson's (2002, 20–21) observation that beginning-oriented hypermeter is more common in rock music. Beneath the prosodic analysis is the dot-notation of Lerdahl and Jackendoff (1983).⁴⁷ I have opted not to annotate the grouping structure (a feature of analyses in their method) because my primary intent is to contrast different systems of metrical annotation. Had I included the grouping, it would show that the effects of the vocal displacement (noted above) could be heard to extend to deeper structural levels.

Tree diagrams are a common non-score-based way to represent metric hierarchy. The diagram shown in **Example 1.7B** illustrates the binary nesting of metric levels in “Karma Police.” If the 1s level is understood to constitute beats, the entire graph describes either system of **Example 1.7A**; if the 1s represent half notes, the graph represents the entire excerpt. (This flexibility of metrical level follows the uniformly binary nature of meter in “Karma Police.”) As Mark Gotham (2015, [2.5]) demonstrates, because such tree diagrams typically show “an ordered succession of duple and triple beat groupings (twos and threes),” the graphic representation can be further condensed to a series of nested brackets. Metrical hierarchy in the verse of “Karma Police,” for instance, can be represented as $((2,2)(2,2))((2,2)(2,2))$.⁴⁸

Justin London (2012) offers one further system of metric representation, emphasizing the cyclic nature of metric levels.⁴⁹ My **Figure 1.3** reproduces two of London's figures (5.4b and 5.6), both of

⁴⁶ My understanding of syncopation in the vocal part follows Temperley (1999). The amphibrach in measure 13 resolves the displacement dissonance into the predominant meter.

⁴⁷ For the authors' comparison of their system of annotation to the earlier system of Cooper and Meyer, see their Example 2.7a–b and the related discussion (Lerdahl and Jackendoff 1983, 20). In later chapters, I employ a modified version of Lerdahl and Jackendoff's dot annotation, pioneered by Osborn (2017).

⁴⁸ Gotham limits his use of this bracket nomenclature to the bar level, thus avoiding overly cumbersome structures, but he does acknowledge that the system “may be continued indefinitely to longer meters as necessary” (2015, [2.9]). In the rest of this dissertation, I use the system to represent metrical structures (like Gotham) or indicate that the primary grouping considers a unit level other than the beat. For a more detailed exposition on representing metric types with bracket notations, including two supplementary bracket systems, see Gotham (2015, [2.6–9]) and Cohn (forthcoming).

⁴⁹ Toussaint (2013) employs a similar cyclic system of rhythmic notation.

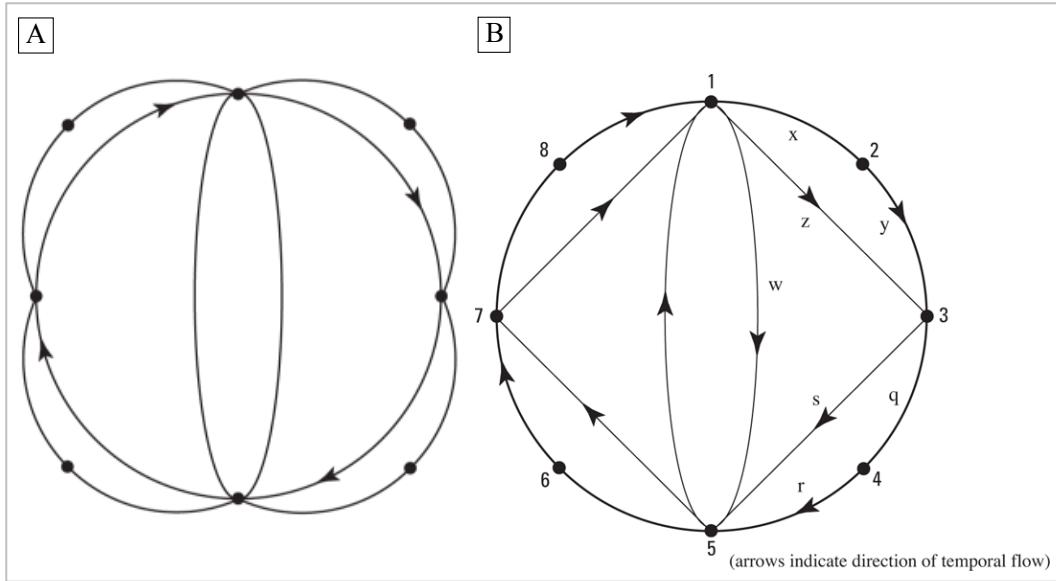


Figure 1.3: Representations of nested duple levels in London (2012): (A) Figure 5.4b—a four-beat cycle with duple subdivisions and half-bar cycle; (B) Figure 5.6—“redrawing of Figure 5.4(b) as an 8 cycle.”

which depict a single measure of 4/4 time, subdivided down to the eighth-note level. Considering the same flexibility noted when applying the tree diagram to a uniformly binary hierarchical structure, observe that the same diagrams could instead represent half notes, measures, and double measures, or any comparable triad of adjacent metric levels. Because of their nested binary structures, these diagrams correspond to many metric levels of “Karma Police.”

The methods of score annotation demonstrated in **Example 1.7A** and the graphic representations of metrical hierarchies shown in **Example 1.7B** and **Figure 1.3** are all very similar. Aesthetic resemblances betray shared structural features; for instance, the boundary of two units at a deeper level is always retained at shallower levels. The similarity of London’s cyclic depiction of meter to the other linear representations may not be immediately apparent but it becomes clear when the graphic is linearized (see **Fig. 1.4**). All of these metrical representations eschew the sort of rhythmic complications discussed above. In some cases—for instance, in close analyses of small numbers of songs—this is a drawback. In studies of larger corpora, however, or in theoretical considerations of meter like the present chapter, the elimination of cumbersome rhythmic detail becomes a positive attribute. Because of their graphic (and conceptual) clarity, models like these make it easy to see which levels are metrically regular and irregular. Compare **Examples 1.6** (“Hey

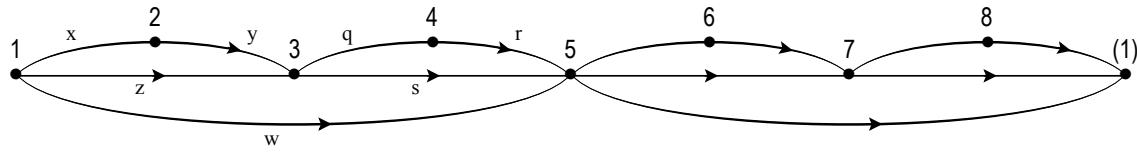


Figure 1.4: Linear version of London’s Figure 5.6.

Ya!”) and **1.7A** (“Karma Police”): in the latter, all levels are entirely regular; in the former, the half-note, measure, and multi-measure levels all partake of some sort of irregularity.⁵⁰

Where these methods differ is in the latent rules underpinning their systems of annotation. Some authors choose not to formalize such rules explicitly, preferring to present meter as dependent on rhythmic happenstance (see, e.g., Cooper and Meyer 1960 and Hasty 1997). Others theorize the potential relationships among pulse levels according to “well-formedness rules” or “constraints.”⁵¹ The most fundamental rules articulate concepts that are easily intuited with respect to most musical traditions, such as beat and attack point. Lerdahl and Jackendoff’s (1983, 72) first two metric well-formedness rules (MWFRs), as finally articulated, read as follows:

MWFR 1 (revised) Every attack point must be associated with a beat at the smallest metric level present at that point in the piece.

MWFR 2 (revised) Every beat at a given level must also be a beat at all smaller levels present at that point in the piece.

London (2012, 90) finds these fundamental rules unobjectionable, “MWFRs 1 and 2 are universal,” and I concur; nothing in my experience with meter in rock music contradicts either point.⁵² Moving beyond these primary definitions, however, it becomes increasingly difficult to generalize about the nature of metric constitution.

⁵⁰ Were a larger excerpt from “Hey Ya!” annotated, it would become clear that, at the level of the six-measure cycle, the hypermeter is regular. Moreover, the apparent irregularity at the half-note level is somewhat misleading because the irregularity is one of function rather than of duration. The consistent binary subdivision of these half-note units is regular, but their grouping into measures is rendered irregular by the presence of an isolated measure of 2/4. As Lerdahl and Jackendoff (1983, 20) observe, this discrepancy arises in systems in which a single level of annotation invokes the functionality of two metric levels (a common approach, given that meter is inherently concerned with hierarchy). The system of dot notation presented by the same authors avoids this potential point of confusion; i.e., a dot notation analysis of “Hey Ya!” would show a regular half-note unit but irregularity at the measure level.

⁵¹ Lerdahl and Jackendoff (1983) employ well-formedness rules and the more permissive preference rules in their formulations of both grouping and meter (GWFRs, GPRs, MWFRs, and MPRs, respectively; see Chapters 3 and 4, and especially pp. 37–9, 69–70, and 72–4). Temperley (2001) follows the same model. The well-formedness constraints of London (2012) aim to describe specifically how the human mind makes sense of rhythmic sounds.

⁵² Temperley (2001, 36) argues for the elimination of MWFR 1 on the grounds that MWFR 2 is adequately restrictive.

Lerdahl and Jackendoff (1983) suggest two further metric well-formedness rules, both of which have been interrogated or revised in more recent scholarship. They are:

MWFR 3 At each metrical level, strong beats are spaced either two or three beats apart (69).⁵³

MWFR 4 (revised) The tactus and immediately larger metrical levels must consist of beats equally spaced throughout the piece. At subtactus metrical levels, weak beats must be equally spaced between the surrounding strong beats (72).

Recent research has essentially overturned this last rule entirely, thanks to a widening of the breadth of musical styles under theoretical consideration (from a focus on Euro-American classical music in Lerdahl and Jackendoff 1983, to the generalized psychological approach of London [2004] 2012, to emerging research on rhythm in other musical traditions). London initially (2004, 72) suggests that rules like this hold only at the lowest stimulus level; he goes further still in the second edition (2012, 92), omitting any such requirement even in defining this lowest level. As Polak and London (2014) compellingly argue, non-isochronous N-cycles (the shallowest metric level) can still provide stable metrical foundations, as they do in Malian drum music and in swung jazz.

Before considering a more complicated set of issues connected to MWFR 3, it will be useful to outline several plausible interpretations of meter and hypermeter in “Hey Ya!” Earlier, I posed three questions about the song, all of which can be expressed in terms relating to metric hierarchy:

1. Measures 1 and 2 can each be subdivided into two half-note units. Is the same true of measure 3 or should the single half note of measure 4 be included as well, forming a three-half-note group?
2. At some level, the first four measures seem to form a single large unit. Does it comprise two smaller units (each two measures in duration) or three (two one-measure units and one unit lasting a measure and a half)?
3. Is it a problem of metric symmetry for a four-measure (seven-half-note) unit to be balanced by a two-measure (four-half-note) unit (mm. 5–6)?

Regarding the first question, consider the two metric annotations represented in **Example 1.8**. They differ in their representation of meter in measures 3–4 (boxed in the example). Analysis A has the benefit of emphasizing the similarity between measures 2 and 3—aside from lyrical content, they are identical and, thus, likely heard as carrying the same metric implications. This analysis also notes the

⁵³ Temperley (2001, 37) reformulates this in his MWFR 2: “Exactly one or two beats at a given level must elapse between each pair of beats at the next level up.”

A musical score for "Hey Ya!" in G major, 4/4 time, with a tempo of 160 BPM. The vocal line starts with "One two three oh! My ba-by don't mess a-round_ be-cause she loves me so_ and this I know for sho'". The score is divided into measures by vertical lines. Above the staff, the letters G, C, D, and E are placed above the first, second, third, and fourth measures respectively. Below the staff, lyrics are written in a 7/8 time signature. Two dot annotations are shown: Analysis A shows a vertical bar line between the third and fourth measures, indicating they are distinct; Analysis B shows a horizontal bar line across both measures, indicating they are extensions of each other.

Example 1.8: Two dot annotations of “Hey Ya!”: (A) showing measures 3 and 4 as distinct at the bar level; (B) showing measure 4 as an extension of measure 3.

The same musical score as Example 1.8, but with a different annotation. In Analysis B, a horizontal bar line connects the end of measure 3 to the beginning of measure 4, indicating that measure 4 is an extension of measure 3. The lyrics remain the same, and the time signature changes from 7/8 to 4/4 at the start of measure 4.

Example 1.9: Two dot annotations of “Hey Ya!” showing an additional multi-measure metric level.

strength of the downbeat of measure 4, emphasizing the change of harmony from the previous measure. For its part, analysis B suggests that measure 4 is an extension (or, following Hasty, a continuation) of measure 3. I find it easy enough to hear the measure as an anticipation of measure 5 (recall that anacrases are a type of continuation). Harmonically, the D major triad can be heard as passing on the way from IV to VI.

The second question is closely related to the first; **Example 1.9** supplies an additional level of annotation for both analyses. Analyses A and B in **Example 1.9** correspond to their namesakes in **Example 1.8**. A listener who hears meter A at the measure level will be inclined towards meter A at the two-measure level. Naturally, our interpretation at any given structural level affects what we can plausibly say of adjacent levels (and, indirectly, of all levels). Multi-measure analysis B is interesting for the nesting of duple and triple subdivisions at two adjacent levels. Extending this analysis to include all of measures 5 and 6 (not shown in **Exx. 1.8 and 1.9**), the hypermeter implied by analysis B reads $(2,2,3)(2,2)$. This introduces the issue raised by my third question. Following the bracketed hypermeter just given, a full six-measure cycle in “Hey Ya!” constitutes a binary temporal structure: a seven-half-note span followed by a four-half-note span. The alternative, following metric annotations A, instead yields a ternary structure at this hypermetrical level: $(4,3,4)$ in half notes. At first blush, because the constituent units are roughly equal, the $(4,3,4)$ parsing may appear more intuitively balanced than the $(7,4)$ option. When we compare this structure (and many of the above

possibilities) to the requirements of various systems of metric well-formedness, however, we see that our intuition often conflicts with theoretical logic.

We are now better equipped to evaluate Lerdahl and Jackendoff's (1983) MWFR 3. A cursory review of recent writing finds subsequent scholarship moving away from the rigidity of the original formulation.⁵⁴ Indeed, even Lerdahl and Jackendoff (1983, 72) recognize that a more flexible rule would have the benefit of accommodating the occasional quintuplet. One of London's (2012, 92) well-formedness constraints (WFCs) provides just such a formulation:

WFC 3.4: Each subcycle must connect nonadjacent time points on the next lowest cycle.⁵⁵

Much of the intervening writing on meter anticipates London's view. The analyses of Horlacher (1995 and 2001) evince a nuanced understanding of the principle London would later articulate; Horlacher discusses situations that call for the reinterpretation of a strong beat as weak or vice versa.⁵⁶ Clayton's (2000) work on Indian rag likewise corresponds with London's constraint (non-adjacency is maintained at each level) but stretches the older definition of Lerdahl and Jackendoff. Specifically, Clayton argues that, in some *Tal* (roughly equivalent to meter), groups of four or five beats are found without subdivision into 2s and 3s.

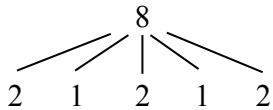
While Horlacher, Clayton, and London all relax Lerdahl and Jackendoff's rule, analysts who allow for successive strong beats, requiring a formulation more flexible than London's, are rarer still. Butler (2006, 84–5) notes the relevance of such beat patterns in clarifying “maximally *individuated*” contexts (e.g., 2,1,2,1,2; italics in original); Murphy (2016) devotes much of his conclusion to sketching the theoretical affordances of successions of 1s and 2s. The tree diagrams of **Figure 1.5** compare Butler's example (which violates London's WFC 3.4) to an analogous metric parsing that is well-formed, according to London's theory. In acknowledging successive strong beats, Butler approaches my own thinking on the matter, although this perspective is admittedly exceptional. Butler does not, however, explicitly extend the implications of successive strong beats at the surface to deeper hierarchical levels. I argue that the identification of successive strong beats at metrical and

⁵⁴ An exception to this trajectory is evinced by Gotham (2015)—a recent and notably restrictive view of metric well-formedness. Gotham offers a list of every possible subdivision of cycles with pulse cardinalities between two and twelve, following Lerdahl and Jackendoff's rules (see Fig. 2, [2.9]).

⁵⁵ London labels this as WFC 5 in the first edition (2004, 72).

⁵⁶ Horlacher's (2001, [2.6]) Example 3.B provides a clear example of her analytical approach and of her innovative annotation markings. Hasty's (1997) theory of meter as projection also supports the notion that strong beats cannot be adjacent; in a lengthy discussion of a five-unit cycle, the author considers parsing single beats as units at higher levels but ultimately “maintain[s] that a measure . . . cannot be formed in this way” (142–4; quotation on 144).

A: Allowing Successive Strong Beats



B: A Well-Formed Alternative

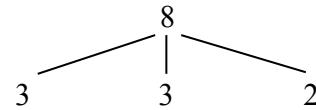


Figure 1.5: Illustrations of two related subdivisions of eight pulses: (A) following an example given by Butler (2006); (B) following the well-formedness restraints of London (2012) and Lerdahl and Jackendoff (1983).

hypermetrical levels is defensible in rock music, where emphatic metric articulation in the drums can clarify the hierarchical organization of middle-ground beat structures.⁵⁷

Both Lerdahl and Jackendoff (1983) and William Rothstein (1989 and 1995) offer profitable models for understanding successive strong beats at (hyper)metrical hierarchical levels. Chapter four of Lerdahl and Jackendoff's treatise, in which they offer their well-formedness and preference rules, closes with a discussion of “metrical deletion,” which the authors define as a “kind of metrical irregularity [resulting from] grouping overlaps and elisions (1983, 101).⁵⁸ Rothstein (1989, 52) likewise suggests that phrase overlap is a prerequisite for metrical reinterpretation—his term for metrical deletion. Elision certainly occurs in rock music where it can prompt metrical reinterpretation; however, it is not the only situation that requires reinterpretation. Two related situations, summarized by Charles Burkhart (1994, 5–6; see **Fig. 1.6**), are successive downbeats—first discussed by Rothstein (1989, 58–63)—and added beats.⁵⁹ Rothstein’s discussion of successive downbeats is informative for our purposes, especially his term *contraction*, which describes cases in which, “through the omission of a bar, two relatively strong measures may succeed each other, although they will not be equally strong” (1989, 58).

⁵⁷ Unfortunately, sources that discuss metric irregularity in rock music have yet to confront this issue, even implicitly. Brackett (2008) posits the recurrence of the same musical materials in diverse metric contexts as a hallmark of Led Zeppelin’s compositional style. Biamonte (2014) is concerned primarily with metric dissonance (largely following Krebs 1999); grouping annotations consist of only a single level and are relegated to surface rhythms (see Exx. 3a–d and 8). Finally, McCandless (2013), who does deal directly with metric irregularity, identifies large groups (of seven to nine beats, e.g.) without clarifying their subdivision. Smaller groups appear only as “motivic residues”—appendixes to patterns of larger groups (e.g., ex. 11, [24]; the term is Schoenberg’s).

⁵⁸ The formulation of this concept as a logical “rule” is somewhat more convoluted than earlier well-formedness and preference rules, requiring two statements of the rule. Furthermore, each of these formulations accounts separately for the deletion of a strong or weak beat (Lerdahl and Jackendoff 1983, 103–4).

⁵⁹ Burkhart’s conception of added beats recalls Rothstein’s (1989, 56–57) discussion of “elongated upbeats,” with the distinction that added beats occur at the end of the phrase, whereas elongated upbeats come before the beginning. In Chapter 6, I theorize a specific sort of overlap that occurs when the intersection of two stable grooves results in an irregular structure; my term for such cases is *metric pivot*.

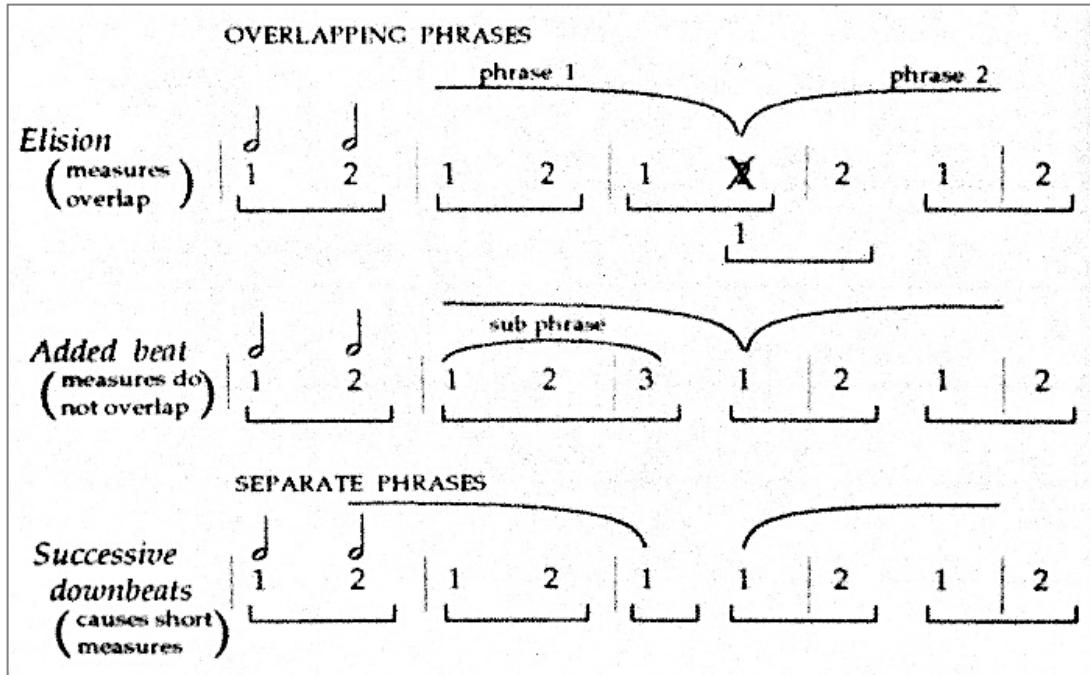


Figure 1.6: Three categories of metric reinterpretation in Burkhart 1994.

While Burkhart limits his discussion of metric reinterpretation to the half-note level, and while both he and Rothstein maintain that instances of reinterpretation are localized to phrase (or sub-phrase) boundaries, it is at least plausible that all three models could be generalized to any metric level and that reinterpretation might occur within a phrase. In his reevaluation of Rothstein's work, Samuel Ng (2009) allows mid-phrase metric reinterpretations, suggesting that cues like clear motivic statements and harmonic rhythm may be sufficient to prompt a reinterpretation. Flexible appropriations of these earlier theories notwithstanding, the deeper conceptual issue is that all of the above descriptions of successive strong beats assume that the best way to understand such musical situations is through the hypothetical addition—and apparent deletion—of intervening weak beats. The requirement, in extant discussions of successive strong beats, for implied weak beats reveals the theoretical issue at stake: namely, the grouping that results from successive strong beats may, if taken at face value, include groups with only one constituent sub-group (an extreme example would be a measure with only one beat). Such single-unit groups fail to differentiate adjacent metric levels from one another. The existence of successive strong beats may thus jeopardize the ontological status of hierarchy itself and, with it, meter. This is precisely why metrically irregular situations can be so unsettling for a listener: they can disrupt our sense of clear hierarchical order—a key to making sense of even the simplest metric structures. Before offering one plausible solution to this potential

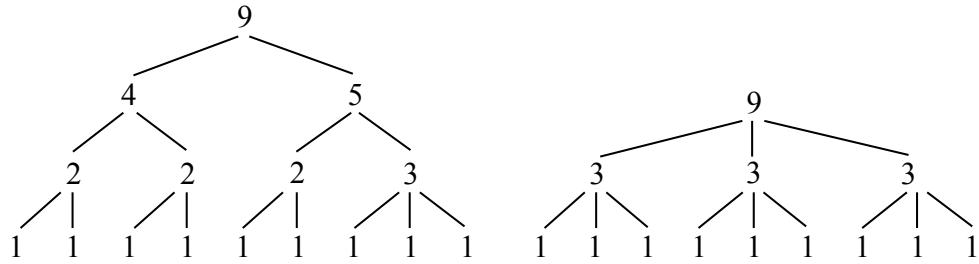


Figure 1.7: Tree diagrams of two motives in Dave Brubeck Quartet’s “Blue Rondo à la Turk” (1959).

crisis of hierarchy, however, I demonstrate that extant theories of hierarchy may not be as airtight as they seem.

Introducing the concept of “sub-tactus pulse cardinality,” Gotham (2015, [4.1]) writes, “in Dave Brubeck’s iconic *Blue Rondo à la Turk*, the repeated four-measure riff in the A sections comprises three (2223) groupings followed by one (333). The principal relation between the two meters is that both are nine pulse-units long.” Gotham establishes that two metric levels (in this case the sub-tactus pulse and the span of a single measure) can remain constant, despite disparities in the organization of intervening level(s). In so doing, he implies that the levels in question retain their hierarchical position in both grouping arrangements—an intuitive assumption, but not one that is necessarily given *a priori*. We can infer further from Gotham’s method (which follows Lerdahl and Jackendoff’s MWFRs) that the first (2,2,2,3) grouping he describes must necessarily be subdivided as (2,2)(2,3) and that the second (3,3,3) neither requires nor admits further subdivision.⁶⁰ The tree diagrams in **Figure 1.7** depict the hierarchical organization of both motives of the opening riff, from sub-tactus pulse to full-measure span. A comparison of the two diagrams reveals a striking disparity: contrary to Gotham’s implication, the measure span occupies a different hierarchical position with regard to each motive, represented by the different vertical positions of the number 9 in **Figure 1.7**.

The issue comes into clearer focus when we consider the grouping of multiple measures in the A section of “Blue Rondo à la Turk.” The full four-measure riff would most likely be subdivided into two two-measure units, the second of which might be represented by a tree diagram combining all of **Figure 1.7** under a duple division of 18 pulses. Such a division would leave a gap in the metric hierarchy—a gap that might conveniently be filled by a single-unit group. This example suggests that

⁶⁰ Gotham (2015, [2]) offers a more complete discussion of his understanding of meter; see Figure 2 ([2.9]), in which both subdivisions noted of “Blue Rondo à la Turk” are given alongside other possible subdivisions of nine-pulse meters and meters of other pulse cardinalities. Incidentally, Gotham’s methodological framework precludes my preferred hearing of the first riff (2,2,2)(3) but the merits of that structure are not strictly relevant to the present argument.

the relevant question is not whether single-unit groups are permissible in theorists' current conception of well-formed irregular metrical hierarchy but, rather, at what level(s) they are permissible.⁶¹ As Lerdahl and Jackendoff (1983, 99) illuminate:

The segmentation of the musical surface forms a hierarchy whose levels can be divided roughly into three zones. At the smallest levels, metrical structure is responsible for most factors of segmentation; at the largest levels, grouping structure bears all the weight of segmentation. In between lies a transitional zone in which grouping gradually takes over responsibility from metrical structure, as units of organization become larger and as metrical intuitions become more attenuated because of the long time intervals between beats.⁶²

The analyses of the same authors often confirm that grouping structures are substantially more hierarchically flexible than metric structures.⁶³ With grouping structures, a single group is allowed to occupy two adjacent hierarchical levels—an elegant solution to issues of hierarchical incongruity like that presented above—and one that is perhaps implied in Gotham's brief discussion of "Blue Rondo à la Turk" (i.e., the (3,3,3) grouping of the second motive occupies both the (2,2)(2,3) and the (4,5) levels implied in the first). This solution is tantamount to allowing single-unit metric groups, with the caveat that it is less likely to represent shallower metric levels adequately.

In rock music, where the backbeat so often influences hierarchies of duple subdivisions that radiate through multiple metric levels (e.g., "Karma Police"), it can be unclear whether three-unit groups are best understood alongside two-unit groups, four-unit groups, or both (i.e., occupying two levels simultaneously). As we will see when we consider "Spark" in more detail, the resulting irregularities can implicate a grouping at two levels even at the music's surface. This is possible because rock music contains clear cues at multiple hierarchical levels. Most clearly, the ubiquity of the backbeat in regular metric contexts allows similar snare patterns to signal the beat level in more

⁶¹ The (2,2,2)(3) grouping I suggested in the previous footnote implies the presence of a single-unit group at a shallower level. Some might argue that an alternative solution to the problem raised by "Blue Rondo à la Turk" is to maintain the metric subdivision (3,3,3) throughout the song's passages in 9/8 time. This serves well enough until, in transitioning to and from the solo section (in 4/4), measures of 4/4 and 9/8 time alternate, the dotted quarter note of the latter becoming a (swung) quarter note in the former. Thus a single measure of 4/4 (2,2)(2,2) is incommensurate with a measure of 9/8 (3,3,3) in the same way as the two motives just discussed. The single-unit group remains at a slightly deeper level.

⁶² See also Cone (1968, 26) and Hasty (1997, 175–82; notably, "for very large measures projective/projected potential becomes, at best, highly attenuated, so that it becomes difficult to grasp meter in the same way or with the same confidence with which we grasp smaller measures" [180]). Although London (2012, 24) holds that "there is no substantive distinction between meters and so-called hypermeters," his discussion of entrainment limitations suggests the same phenomenon of metric attenuation, without recourse to arbitrary terminological designations.

⁶³ See, e.g., Lerdahl and Jackendoff (1983) Chapter 3, including Example 3.36 and its discussion on pages 65–66.

The musical score consists of three staves. The top staff is labeled 'Synth' and shows eighth-note patterns. The middle staff is labeled 'Bass' and shows quarter-note patterns. The bottom staff is labeled 'Drums' and shows sixteenth-note patterns. The time signature is 5/4 throughout. The tempo is indicated as quarter note = 176.

Example 1.10: A common 5/4 backbeat variant in Muse’s “Animals” (2012).

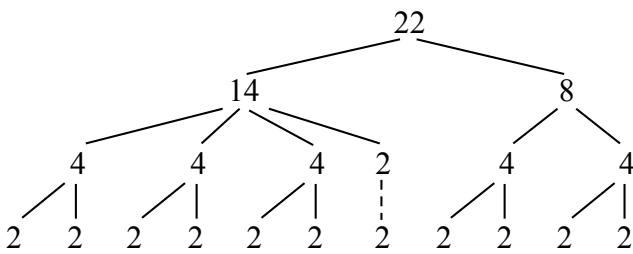


Figure 1.8: Tree diagram of metric hierarchy in OutKast’s “Hey Ya!” (2003).

irregular contexts. The bar level is likewise strongly correlated with cycles containing two snare backbeats—whether or not they suggest a regular meter. A common example of this occurs in 5/4 time, with the backbeats falling on the second half of beat two and on beat five (e.g., “Animals,” Muse 2012; see **Ex. 1.10**). When analyzing rock songs in irregular meters, it is often helpful to consider the most stable metric levels first and allow cues at those levels to determine the parsing of other levels.

Returning one final time to “Hey Ya!,” I have already argued that the beat level is unambiguous (and, with it, the half-note level). The same can be said of the measure level, except for the fourth measure, in 2/4 time. Because the stability of this measure is established by the first three (regular) measures, it is counterintuitive to fold measure 4 into measure 3, interpreting a measure of 6/4. I argue that the measure of 2/4 necessarily occupies two levels at once, as shown in **Figure 1.8** (see also analysis A in **Ex. 1.8**, above). At the multi-measure level, I hear a four-measure group followed by a two-measure group; this is due to the motivic similarity of measures 2–3, bolstered by their retention of the same C major harmony (refer to **Exx. 1.3** and **1.6**). Recall that four-unit groups are

Lyrical Phrase	regular	11
Hypermeasure	irregular	7, 4
Measure	irregular	2 (1)
Half Note	regular	2

Table 1.1: Metric hierarchy and regularity in OutKast’s “Hey Ya!” (2003).

Lyrical Phrase	irregular	(36, 61) 52, 60 (18, 50, 13, 49, 53)
Hypermeasure	irregular	(18) 13 (12, 16, 15)
Measure	irregular	6 (7, 10, 9)
Dotted Quarter / Quarter	irregular	3, (4 = (2,2))
Eighth Note	regular	2

Table 1.2: Metric hierarchy and regularity in Tori Amos’s “Spark” (1998).

allowed under London’s WFCs; my hypermetric grouping is thus substantially less contentious than my treatment of measure 4 at the measure level.

In summarizing my discussion of “Hey Ya!,” I will introduce a new way to represent metric hierarchy and regularity (see **Table 1.1**). My table offers a condensed account of elements of regularity and irregularity in the song, arranged according to a hierarchy of metric levels. At the bottom is the largest span in the song beneath which all pulse levels are consistently regular; the number two (2) designates the duple subdivision of these spans. Numbers beside any deeper level refer to the number of pulses of the nearest shallower regular level. Multiple numbers attend each irregular level: in cases when one subdivisional cardinality predominates, others are bracketed (note the measure level in **Table 1.1**); commas separate subdivisions that receive equal representation (e.g., at the hypermeasure level); all subdivisions are listed in the order they first occur in the song. The term “lyrical phrase” refers to a level above the hypermeasure but below an entire formal unit, each unit of which corresponds to a line in the song’s lyrics.⁶⁴ As a representation of the song, the table sacrifices detail in the interest of concision; on its surface, then, this method seems best suited to the comparison of multiple songs. I will demonstrate presently, however, that the same type of table can also offer insight into the form of an individual song.

Recall the more thoroughly irregular metric complexion of Tori Amos’s “Spark.” Whereas a full tabular analysis of the song in a single set of columns yields a far more cumbersome result than “Hey Ya!” (see **Table 1.2**), a slightly more involved table—comprising several columns delineated

⁶⁴ The invocation of a song’s lyrics in identifying spans at the lyric phrase level has the notable benefit of avoiding the expectation that phrases be defined primarily (or even solely) on the basis of tonal motion to a cadence.

Formal Section	introduction		verse 1		verse 2		chorus	
Hypermeasure	regular	3	irregular	13 (12, 16)	regular	13	regular	2
Measure	regular	2	irregular	6 (7, 10)	irregular	6, 7	regular	2
Dotted Quarter / Half Note	regular	3	irregular			3 (4 = (2,2))	regular	3
Eighth Note	regular				2			
interlude	verse 3		chorus	bridge		chorus	verse 4	
once regular regular regular	3 2 3 regular	regular irregular irregular regular	13 6, 7 3 (4)	as before	irregular irregular irregular	12, 13 6 (7) 3 (4)	as before	irregular irregular irregular
					2		(15) 13 6 (9, 7) 3 (4)	

Table 1.3: Metric hierarchy and regularity by formal section in Tori Amos’s “Spark” (1998).

according to formal section—offers a more nuanced view (see **Table 1.3**). Some formal sections still contain a high degree of irregularity (e.g., verses 1 and 4), but the nature of this irregularity is more easily understood in this contextual representation. The tabular layout also has the advantages of highlighting sections with regular metric structures (e.g., the intro and choruses) and of allowing easy comparison of these more normative passages to the unique irregularities of other sections. My replacement of the lyric phrase level with labels of formal sections reflects the fact that, at the slow tempo of “Spark,” higher level groupings cannot intuitively be said to retain substantive metric meaning above the hypermeasure level. (In “Hey Ya!” the faster tempo allows the eleven-half-note-pulse span to retain more metric relevance.)

A cursory comparison of **Tables 1.1** (“Hey Ya!”) and **1.3** (“Spark”) reaffirms that metric irregularities pervade the latter song more thoroughly than the former. To a large extent this is because, in “Spark,” additional complications arise at the beat and sub-beat levels and radiate through the song’s higher levels. Specifically, the addition of a single eighth-note pulse in the context of a compound duple (6/8) meter can be interpreted as either an added beat—i.e., (3,4)—or requiring a shift to an irregular triple meter, from (3,3) to (3,2,2). For the listener who prioritizes the retention of a duple meter, and who thus hears the added-beat interpretation, the dominant triple subdivision might occupy two hierarchical levels (see **Fig. 1.9**). This is more disruptive to our sense of a stable metric hierarchy than the situation in “Hey Ya!,” in which the double-functioning unit was the exception, rather than the rule. In either case, the subtle irregularity at the music’s surface in “Spark” affects both the sub-beat and beat levels. Furthermore, while some formal sections are characterized by the regular alternation of these irregular measures with measures of the more

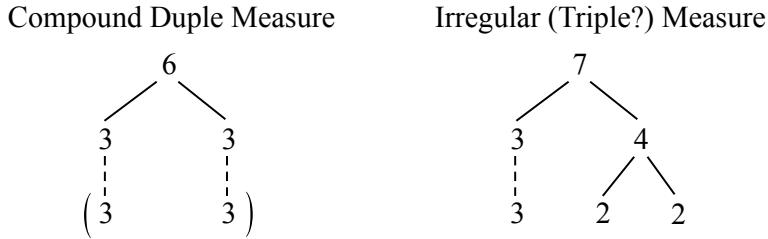


Figure 1.9: Tree diagram of sub-beat irregularity in Tori Amos’s “Spark” (1998).

normative compound duple meter (e.g., verses 2 and 3), others contain interposed measures of 9/8 (verse 4) or two-bar units without an added eighth (verse 1, bridge). One of the greatest strengths of the metric form diagram is its representation of both the extensive irregularities found in rock songs like “Spark” and elements of regularity (when present), without sacrificing the concision and legibility of the single-column format.

Conclusion

Having discussed meter and metric irregularity in rock music primarily via extant theoretical writings thus far, I would like to conclude with an original formulation of meter-finding in rock music (see **Fig. 1.10**). The model I present begins with assumptions from the most successful theories of meter and modifies these when necessary based on my stylistically informed intuitions about rock music. It remains to be seen if my modifications are borne out by further study. Further, this model represents a particular prioritization of various sorts of musical data—temporal, dynamic, timbral, and registral. Just as these cues may assume greater or lesser priority in distinguishing rock music from other styles, so the definitions of rock subgenres may rest in part on a more nuanced prioritization of these same musical elements (as well as others). In what follows, I draw attention to relevant details and exceptions of this model and to examples from the analyses of this chapter.

First, as demonstrated by the examples in this chapter and in countless other writings, beat and measure are fundamentally stable units in most rock music. This is supported by the backbeat: each backbeat articulation is assumed to constitute the second beat of a beat pair; likewise, two beat-pair cycles typically form a measure. The most intuitive and basic process of meter-finding in rock music is therefore the acceptance or rejection of the backbeat as functioning in a traditional role. As Trevor de Clercq (2016) indicates, so-called half-time and double-time are available as stylistically codified grooves in several genres. Exceptions like these may argue against accepting a stable backbeat-like rhythm. Further study is needed of the stylistic affinities and rhythmic details that invite us to reject

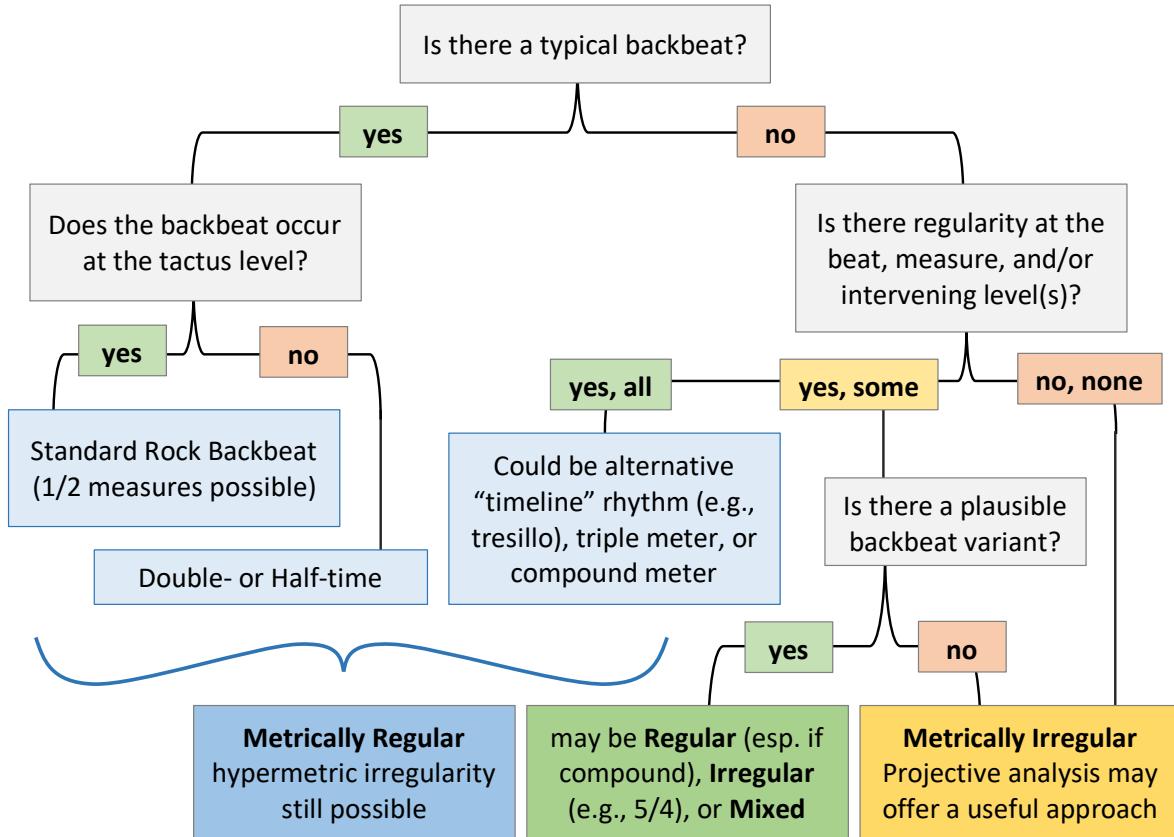


Figure 1.10: Meter finding in rock music: a speculative model.

a plausible backbeat. One factor, the subject of de Clercq's (2016) article, considers the time-span boundaries I noted earlier, which structure London's definition of meter. The acceptance of a backbeat rhythm, if present, should nonetheless be seen as a strong first-level default in rock music. Half-time and double-time grooves are related, lower-level possibilities for understanding regular metrically continuational articulations of the snare drum (or other instruments).

In the presence of an accepted backbeat, the listener likely assumes a regular half-note span, even in the presence of mild rhythmic dissonance.⁶⁵ The grouping of these half-note durations proceeds one level at a time, until the feeling of metric relevance ascribed to durational (ir)regularity is eclipsed by formal considerations. The measure is most relevant in this regard. As in my analysis of “Hey Ya!,” the identification and projection of four-beat (two-half-note) durations isolate each measure of 2/4 time as a unique irregularity within an otherwise regular hierarchical level. At the level of lyric phrases, we apprehend that these irregularities participate in a deeper regular periodicity.

⁶⁵ What constitutes a “mild metric dissonance” will, of course, vary from listener to listener.

In the absence of an accepted backbeat, the first two stages are inverted. First, regularity is sought out at several levels—not only at the measure level, but also (given the absence of backbeat stability) at the beat and any intervening level(s).⁶⁶ If regularity is found, irregularities at adjacent levels are parsed according to available regular cues. For example, in many songs in 5/4 time—including Muse’s “Animals”—a subdivision of (3,3)(2,2) obtains, which, while inherently irregular, can be parsed as a variant of the more common (2,2)(2,2) quadruple subdivision of (regular) 4/4 time.⁶⁷ Understanding an irregular meter as a variant of a regular analogue exemplifies the second stage: a disposition towards hearing backbeat-inspired patterns in meters in which the standard rock beat is absent (or even impossible). The example of 5/4 time is only one intuitive example; the same process can also occur when a tresillo rhythm is given without the clarifying accompaniment of an explicitly stated backbeat. (This is a very common pattern in 4/4 meters in ska and (pop-)punk-rock genres; cf., “Hey Ya!,” in which tresillo and backbeat rhythms are both present.)

Even when elements of regularity prove elusive, processes of meter-finding remain active. “Spark” provides a more complex example, in which the search for elements of regularity and plausible backbeat variants aid us in making sense of a highly irregular surface. As I described in my introduction of “Spark,” the predominance of triple subdivision is the first pseudo-regular cue to which we might gravitate. The salient articulation of the snare drum on non-downbeats (i.e., potential backbeats) suggests that this triple division occupies the subtactus level; this hypothesis, coupled with the resulting slow tempo, invites us to hear 6/8 time as a normative meter in the song, against which extensions at the subtactus and tactus levels (e.g., 7/8 and 9/8 time, respectively) are comprehensible.

The model for meter finding in rock I have proposed suggests an answer to an earlier question regarding the categorical distinction between meters in which the backbeat is present and those in which it is not. Following my model, the presence or absence of the backbeat does not imply a difference of type, but only one of degree. Although all meters in which the backbeat occurs are necessarily regular, not all regular meters include the backbeat. Nevertheless, the backbeat remains

⁶⁶ In ¾ time, there is no intervening level. Otherwise, a single level is the most common case. In meters with cardinalities larger than six, multiple levels are plausible, though the lowest level (the would-be beat level) may be reinterpreted as a sub-tactus pulse.

⁶⁷ Depending on the specifics of the example, the same pattern of articulations may also be understood as a rhythmic dissonance against a (2,2,2)(2,2) meter. I treat these and other possibilities in greater detail in Chapter 4.

an important first-order criterion in meter finding and an essential stylistic component of rock musics in meters both regular and irregular.

— 2 —

The Corpus: Method and Findings

This project is built around a corpus study of 240 songs that share a number of features—genre, historical period, instrumentation, and, of course, some degree of metric irregularity. My most detailed analytic work concerns this sample of songs but, in much of the present chapter, I take a broader view in the interest of achieving two related goals. First, by acquainting the reader with some general metric trends in rock music (and other Euro-American popular music), I hope to foster a deeper appreciation for the metric idiosyncrasies of the corpus. Second, whereas many large-scale studies of rock music are bounded by a pre-existing source list, the sample for this project is more eclectic, drawing from many sources.¹ Thus, an equally important function of this chapter is to introduce those sources and explain the process through which my corpus was compiled. Following this overview of sources and delineation of the corpus, I turn to the resulting collection of songs, summarizing broad trends according to the hierarchical level and functional type of metric irregularity in each song.

Two points should be borne in mind throughout this chapter. First, the information covered is, for the most part, quite general. Many of the boundaries I suggest are fuzzy and, while I attempt to draw attention to ambiguities when relevant, it is often necessary to overlook certain details in order to highlight commonalities. When considering the larger source collections, space simply does not allow for comprehensive discussion. In the case of the corpus, the general information in this chapter sets the stage for more detailed inquiry in those that follow. Second, this chapter relies on numerous charts and figures to represent pertinent data. Careful examination of these illustrations can serve to deepen the reader’s knowledge of the music under consideration and reveal details that, for considerations of time, are omitted from my prose. At the same time, it is important to remember that these visual representations are themselves abstractions of already-generalized sets of data and methods of analysis. While abstraction is a powerful tool in the study of large groups of

¹ Recent examples that avail themselves of extant lists include de Clercq and Temperley (2011), Summach (2012), and Temperley and de Clercq (2013). My approach is more similar to that found in Biamonte (2014), which concludes with remarks on seven distinct corpora.

songs, every song is ultimately a unique locus of diverse sonic, creative, and emotive elements—a fact we must endeavour not to lose sight of in a study such as this one.

The main reason for the eclecticism of the present corpus stems from the fact that metric practice, like many musical dimensions, is often idiosyncratic to a given artist or group. In this dissertation, I highlight Tori Amos, Radiohead, and Tool as case studies in metric irregularity. All three artists occupy the same recent epoch in rock music history, having released their first recordings in the early 1990s and remaining active to this day. Most importantly, all three artists are at the vanguard of metric exploration in recent rock. Radiohead is likely the most iconic experimental rock group in recent years, while the recordings of Amos and Tool include some of the most captivating explorations of metrically irregular space in all rock music.² Moving outward from the recordings of these three “core artists,” I follow the familiar practice of consulting extant lists in music magazines (*Billboard* and *Rolling Stone*) and online (*Wikipedia*).³

Before examining these sources in detail, however, a few boundaries must be established, among which the first is the simple matter of size. In reviewing corpus studies of popular songs, one encounters a wide range in sample size. Smaller corpora consider as few as 100–200 songs, while larger studies may consider as many as several thousand.⁴ This range suggests that corpora of different sizes are appropriate to investigating different questions. Smaller corpora sacrifice generalizability of findings for analytic detail and accuracy; they are thus better suited to answering more complex questions. Larger corpora prioritize the opposite goals and are better equipped to demonstrate broad trends among more diverse constituents. The relatively small size of this study (240 songs) responds to the need for close analytic attention to understand properly the nature of metrically irregular phenomena. Taken together, the sources from which I assembled the corpus constitute a much larger collection (over 4000 songs in total), which permits analytical insights of a

² The relevance of all three artists to contemporary popular culture is evident in their commercial success (for US market data, see <https://www.riaa.com/gold-platinum/>). Regarding Radiohead’s status, Walter Everett’s promotional copy for Osborn’s (2017) monograph is illustrative: “Radiohead is the single most important rock group since 1970.”

³ See, e.g., de Clercq and Temperley (2011) and Temperley and de Clercq (2013), both of which consider a portion of *Rolling Stone* magazine’s “500 Greatest Songs of All Time” (2004)—100 songs in the former (the 20 highest-ranked entries on the list in each decade from the 1950s to the 1990s), 200 in the latter (the same 100 supplemented by the 100 next-highest-ranked songs, regardless of decade). Similarly, Biamonte (2014) treats the 200-song collection established by de Clercq and Temperley, while Summach’s (2012) dissertation is based on *Billboard* magazine’s “Annual Top-20s.”

⁴ The distinction often corresponds to the method of analysis undertaken by the author(s) of a given paper. If a computer program carries out the analysis, a large corpus can be retained (e.g. Mauch et. al. 2015). Cases in which humans conduct the analysis, however, are limited to smaller numbers of songs (e.g., de Clercq and Temperley, 2011, Temperley and de Clercq, 2013, and Biamonte, 2014).

more general nature. I give special attention to *Billboard* magazine's "The Hot 100" list below because of its long historical span and wealth of constituent songs.

The second boundary, more difficult to establish by far, is the need for a working definition of rock as a genre.⁵ For the purposes of this study, I propose a dualistic definition of rock. On the one hand, rock is often understood as a commercially oriented genre, akin to and sharing several features with Euro-American popular music broadly conceived—hereafter "pop."⁶ As Gracyk observes, "rock embraces a host of performance styles, . . . most have *some* basis in African American popular music, are rooted in song, and paradigmatically exist as *recorded* music" (1996, 7; emphasis in original). On the other hand, many define rock according to its transgressive features, emphasizing an opposition to pop. This seems to be the more commonly held view among music theorists.⁷ Ultimately, rock as a genre encompasses both definitions; their importance relative to one another fluctuates depending on the artist or song in question, the identity of the writer, fan, or critic, and countless other contextual cues. For example, whereas the music of Tool is too transgressive (too hard, too counter-cultural, borrowing too much from metal genres) to have more than limited success on charts like *Billboard*'s "The Hot 100," it is not difficult to find descriptions of their style in online metal forums that read like reviews of the most commercialist music. Posting to the website *Ultimate Metal* under a thread about Tool, user Vital Remains writes, "The guitar playing is kind of . . . well really simple, but it's catchy and I guess if it sounds good that's all that matters."⁸ The inverse situation, in which pop artists exhibit stereotypically transgressive features, is also common. Furthermore, it is important to distinguish between the culturally transgressive, often expressed in lyrical themes, and the sonically transgressive—i.e., elements of the music's composition and production. The present study is chiefly concerned with the latter.

Given the apparent mobility of rock's transgressive and commercially rooted identifiers, a spectrum—from the most widely distributed commercial pop to metal subgenres like thrash and

⁵ For more in-depth theorizations of genre, see Fabbri (1982), Negus (1999), McLeod (2001), and Holt (2007).

⁶ Music theorists who refrain from differentiating between rock and pop include Zbikowski (2004, 275) and Temperley (2011b, [1.8]).

⁷ Writers who distinguish rock from pop include Moore (2001, 3–4), Stephenson (2002, xiv), Biamonte (2010, 95), Temperley (2011a, [1.5]), and Attas (2015, 275).

⁸ Retrieved from <http://www.ultimatemetal.com/forum/threads/tool.219556/> on December 14, 2016. See also Walser (1993, 6–7) on the fluidity of generic definitions.

doom—provides a useful heuristic.⁹ Like any heuristic, this view oversimplifies the matter, but it facilitates further discussion. One complicating factor is the intersection of this hypothetical “rock spectrum” with other generically oriented spectra—which might likewise be framed as a tension between commercialism and transgression.¹⁰ Another is the presence of subgenres, which contribute substantially to the complexity of the generic landscape.¹¹ Despite these complications, and others like them, the idea of a spectrum suggests the relevance of the terms “commercialist” and “transgressive” to my discussion of rock music and these terms will prove useful in framing the corpus and its sources in relation to one another. I do not wish to suggest that the relevance of such a spectrum precludes the existence of meaningful categories along it. On the contrary, four such categories or “generic clusters” undergird my approach to genre in this study: these are, from most transgressive to most commercially oriented, “metal,” “transgressive rock,” “commercially oriented rock,” and “pop.” I maintain that there are meaningful distinctions between these four genres, though the boundaries are supple, defy clear definition, and contain a great diversity of musical practices and sonic ideas.

Because definitions of genre are built on the collected properties of tens of thousands of songs, it is important that we do not overlook the status of the individual song within this discussion of genre. While the artist occupies a central position in most such discussions (e.g., my above illustration using Tool), I argue that songs—or song sections—can be considered separately from their creator(s). OutKast’s “Hey Ya!” (see Chapter 1) has significant rock elements mediated by a funk aesthetic, despite the fact that the group is most commonly billed as a rap or hip-hop duo.¹² Tori Amos consistently occupies an eclectic generic space, ranging from baroque pop to electronica, from blues-rock to adult contemporary; a song-by-song approach is perhaps the only way to make

⁹ A more sophisticated map of genre—an algorithmic arrangement of artists according to similarity relations, following data from the last.fm music network—can be explored at http://sixdegrees.hu/last.fm/interactive_map.html. The clusters of green (pop), red (rock), and grey (metal) entries illustrate the spectrum I propose.

¹⁰ For instance, the pop music of recent decades is heavily indebted to generic clusters centred on rap and hip-hop, and electronic music; each generic sphere contains a range of more- and less-commercial and more- and less-experimental artists. Questions as to how a supposed hip-hop spectrum might intersect with the rock spectrum, or whether all genres converge on an eclectic commercially viable melting pot of creative influence, are beyond the purview of the present discussion, but they speak to the complications involved in navigating ideas of genre.

¹¹ For more on subgenres, see Hebdige (1979), Straw (1991), and Moore (2001).

¹² *Rolling Stone* identifies the song’s genre simply as “rock,” quoting writer and producer André 3000 who notes that the guitar part was “inspired by ‘the Ramones, the Buzzcocks, the Smiths’” (2011, “500 Greatest Songs of All Time,” <http://www.rollingstone.com/music/lists/the-500-greatest-songs-of-all-time-20110407>, accessed February 20, 2017).

sense of such a body of work.¹³ My adoption of such an approach contributes to the heterogeneity of the corpus in a positive way. For example, my discussion of *Billboard*'s "The Hot 100" below stems primarily from a desire to offer a history of pop music and might thus be seen as ancillary to a project ostensibly centred on rock. However, in analyzing the songs of "The Hot 100," I encountered six cases deserving of a space in my corpus, two of which are not duplicated in other sources. While the addition of two songs to a sample of 240 might seem insignificant, the demographic details of the songs in question are noteworthy: both Taylor Swift's "I Knew You Were Trouble" and "Underneath it All" by No Doubt featuring Lady Saw are by female artists who would otherwise be absent from the corpus. Given that rock is an overwhelmingly male generic space, a flexible approach to identifying songs at the edges of the genre becomes all the more desirable.

Ultimately, the question of genre is so complex that a degree of intuition is inseparable from the work of generic definition. Some readers will doubtless argue that some of the songs I discuss do not properly belong to rock. Provided we accept that questions of genre are inherently fluid, the precise boundaries are less important than the discussion that surrounds their creation. Moreover, the persistence of such discussion is proof in and of itself that genre is constructed and that projects like this one, in which musical-technical features receive careful analysis, can contribute in meaningful ways to the negotiation of relevant definitions.

The Corpus and Its Sources

In this section, I review the various collections of songs that contribute to the corpus, proceeding to consider the boundaries that unify the corpus itself. I conceive of each source as falling loosely into one of two categories according to the understanding of genre outlined above: some inform a more commercially oriented notion of rock (and "The Hot 100" deals more with pop than rock), others a more sonically transgressive one. The commercially oriented sources come entirely from the public domain, and predominantly from *Billboard* magazine's weekly popularity rankings. Specifically, I consider high-ranking songs from three lists: "The Hot 100," "Alternative Songs," and "Hot Rock

¹³ The rather neutral term "singer-songwriter" is common in journalists' references to Amos (see, e.g., <http://toriamos.com/go/press/>, accessed February 20, 2017). The same term appears in the first sentence of her *Wikipedia* page, though the "Genres" listed in a sidebar better reflect Amos's range; notably, "Alternative rock" is the first label here (https://en.wikipedia.org/wiki/Tori_Amos, accessed February 20, 2017).

Songs.”¹⁴ I also review *Rolling Stone* magazine’s “500 Greatest Songs of All Time.” The three artists that form the core of the corpus (Tori Amos, Radiohead, and Tool) fall closer to the transgressive end of the spectrum; theirs is some of the most metrically irregular music found in this study. I consider every song found on a full-length studio recording by these three artists. The transgressive side is rounded out by one last public-domain list: *Wikipedia*’s “List of musical works in unusual time signatures.” While this dualistic breakdown ensures that a variety of sources are consulted, there is substantial overlap between these sources. Many songs by core artists and from the *Wikipedia* list have achieved chart success. Moreover, even in the less transgressive, commercially oriented sphere, we encounter more metric irregularity than is commonly acknowledged.

Before reviewing each source in turn, a brief word on publicly curated lists is in order. My reliance on such sources follows an example found in numerous recent corpus studies of rock music (many of which I refer to in the present chapter). The appeal of this method lies in the importance of relinquishing (some) control over which songs are included in the corpus; in other words, I want a sample that extends beyond my personal tastes.¹⁵ Of course, the use of extant lists also has its drawbacks, some of which are especially acute in the case of *Wikipedia*. The ways in which *Wikipedia* is edited and organized obscure the transparent connection of knowledge to an author—a central feature in academic epistemology. In recent years, the site’s editorial policy has shifted to prioritize proper citations, but many articles are still lacking in this regard. More concerning, recent scholarship has identified a sizeable gender disparity among *Wikipedia*’s editors, which some have suggested results in biased content.¹⁶ It will probably not come as a surprise, then, that *Wikipedia* is far from an ideal source; however, lists of transgressive songs in general and metrically irregular ones in particular are both rare and problematic. My recourse to *Wikipedia* places my interest in a public-domain source of metrically irregular songs above the site’s numerous shortcomings, but those shortcomings should be borne in mind as we proceed to consider the sources in greater detail.

¹⁴ Studies that take the *Billboard* weekly Hot 100 list as a corpus are found in a range of disciplines, including cultural studies (e.g., Mondak 1989, Carroll 2015), but also statistics (Bradlow and Fader 2001) and economics (Giles 2007).

¹⁵ On this point, see also Covach and Flory (2012, 6) and Summach (2012, 9–10).

¹⁶ On the gender gap in *Wikipedia*’s editorship, see Gruwell (2015) and Shane-Simpson and Gillespie-Lynch (2017). On the biasing of the site’s contents, see Wagner et al. (2016).

PREDOMINANTLY COMMERCIALY ORIENTED SOURCES

Billboard's “The Hot 100”

The most extensive source I consider is also the most consumerist; the vast majority of songs on “The Hot 100” are likely best understood neither as rock, nor even as rock with a popular leaning, but as pop songs.¹⁷ This source provides a panoptic view of metric irregularity in popular songwriting. The survey begins with the inception of “The Hot 100” in August 1958 and continues through the end of 2015. To prevent the study from becoming unwieldy in size, I have limited inclusion in this survey to those songs that have charted in the top three positions in a given week.¹⁸ The resulting list of songs includes exactly 2000 unique entries. No further culling according to factors such as instrumentation or genre is applied to this list, nor are any such factors considered in categorizing the songs. Rather, my analysis of this song set consists simply of categorization according to each song’s lowest level of metric irregularity (see Chapter 1) and earliest year on the chart. The results of this process of categorization are presented in **Figure 2.1**.

Several features of **Figure 2.1** demand clarification before reviewing its contents. While the horizontal axis presents a familiar timeline, the categories tracked along the vertical dimension are less intuitive. The legend below the table summarizes the significance of the coloured bar segments. The lowest level of irregularity, “beat,” considers not only odd-cardinality meters like 5/4 and 11/8, but also alternations of common meters with different cardinalities (e.g., verses in 6/8 and choruses

¹⁷ The chart aims to rank “[each] week’s most popular songs across all genres” (<http://www.billboard.com/biz/charts/the-billboard-hot-100>, accessed December 20, 2016). Song rankings are determined based on a combination of radio airplay and sales data (see *ibid* and <https://www.customchannels.net/billboard-hot-100-music-chart/>). More recent entries also account for digital downloads and streaming data. The full history of the list can be explored online at <http://www.billboard.com/charts/hot-100>. For more information on this and other *Billboard* charts, see <http://www.billboard.com/biz/billboard-charts-legend>. For information on Nielsen, the international firm that tracks consumer data for *Billboard*, see <http://www.nielsen.com/us/en/solutions.html>; two pages accessible from the Canadian site offer some information on the company’s measurement of radio airplay (<http://www.nielsen.com/ca/en/solutions/measurement/radio-streaming-measurement.html>) and music sales (<http://www.nielsen.com/ca/en/solutions/measurement/music-sales-measurement.html>) but neither appears to have a direct analogue on the United States site.

¹⁸ While this limitation is of course arbitrary, it is necessary; I alone could not possibly analyze the full contents of the chart, even at a perfunctory level. My recourse to a hard limit based on time-span blocks follows the example set by de Clercq and Temperley (2011). In establishing a chronology for this survey (and for other surveys whose source is a *Billboard* chart), I consider songs according to the first year in which they chart in a top-three spot, rather than according to their date of release. This move retains an important epistemology inherent in the source data: *Billboard* charts purportedly represent consumer tastes, rather than trends in songwriting. One concession of cataloguing songs by chart date rather than release date concerns cases when a song appears on the chart in one year but does not reach the top three until the following year. The benefit, however, is that my approach results in a more intuitive treatment of songs that chart many years after their initial release—a situation occasionally prompted by a song’s inclusion in a movie soundtrack or by the death of a songwriter.

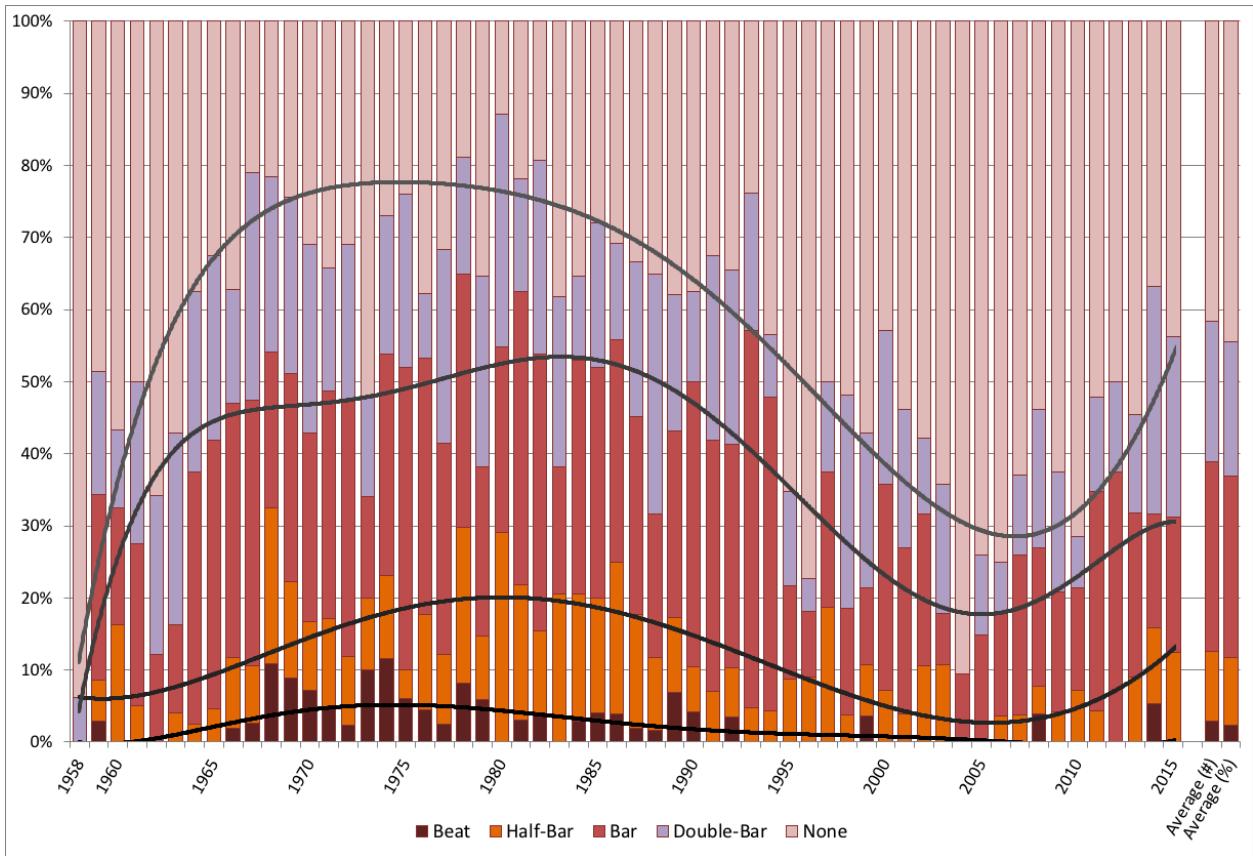


Figure 2.1: Chronology of metric irregularity in *Billboard's* “The Hot 100,” with trend lines.

in 4/4).¹⁹ Songs predominantly in a single regular meter but with isolated nonconforming measures also belong to this category (e.g., a song in 4/4 with a single bar of 3/4). The “half-bar” level considers songs predominantly in 4/4 time with isolated measures of 2/4 or, rarely, songs in 6/8 with isolated measures of 3/8. The “bar” level considers the addition or deletion of a single measure (or measures) within a predominantly foursquare hypermetric context. Also belonging to this category, though arising less frequently, are songs in which three- or five-measure hypermeter characterizes entire phrases or formal sections. A fourth category, “double-bar,” considers those songs with no greater irregularity than a two- or (occasionally) six-measure group within otherwise four-measure hypermeter. This category might just as profitably be understood as bearing the alternative title “half-hypermeasure.” Above this level we leave considerations of meter and enter

¹⁹ Later in this chapter I introduce an additional, lower level of hierarchy—“sub-metric,” concerned most often with the level of the eighth note. I refrain from tracking this hierarchical level in the present section to avoid adding unnecessary clutter to several figures.

the realm of form.²⁰ I therefore count songs without irregularity at the double bar or lower in the category “none” (i.e., no metric irregularity).

The two rightmost columns track overall average. The first, denoted by a number sign, is based on a simple tally of each category: every song analyzed contributes equally to the resulting figure. The second, denoted by a percentage sign, offers a weighted average, in which each year is tallied independently and the resulting percentages are summed and averaged. The distinction is significant because of the variance from year to year in the total number of songs reaching top three spots on the chart. For example, in the years 1959–1991, just over forty-three songs reach the top three each year on average; the number drops significantly between 1992–2015 to twenty-four. At the most extreme, we find years in which as many as sixty songs (1988) or as few as sixteen (1997 and 2015) chart in the top three spots.²¹ Because of the variance in data from year to year—in terms of both sample size and the resulting numbers—I have superimposed trend-lines over the bar graph to clarify patterns that emerge in the longer ranging historical view.²² Conspicuously, all four trend-lines follow the same general contour: an increase through the 1960s, more gradual change through the 70s and 80s with a peak somewhere in this range, a marked decline through the 90s reaching a minimum around 2004–5, and a renewed increase thereafter.²³ The apparent trends at the beginning and end of the timeline should not be taken as necessarily representative of those years—not least because of the potentially anomalous data in 1958 (see footnote 21). Nevertheless, even if we discount the most dynamic changes to the trend-lines in the first and last years of this survey, one overarching trend emerges: commercial pop of the past three decades (the same period considered by my corpus) has been markedly less metrically irregular than that of decades previous.²⁴

²⁰ As Summach (2012, 17) observes, “Rock songs are typically deployed within a steady, 4-bar grid; that is, their constituent modules span some multiple of 4 bars. Module lengths of 8, 12, and 16 bars are the most common.” However, “Auxiliary modules, [which] frame and separate the core modules in a rock song, . . . may be shorter than core modules—lengths of 4 and even 2 bars are possible” (*ibid.*, 40). Ensign (2015, 24), concerned primarily with post-1990 repertoire, largely agrees with Summach but inclines modestly toward shorter modules (“as short as four bars but . . . seldom longer than 16.”) Overviews of form in rock music are also offered by Stephenson (2002), Covach (2005), Everett (2009b), and de Clercq (2012).

²¹ The year 1958 also offers only 16 entries due to the fact that the chart was first published in August of that year.

²² The polynomials all have an order of six, except the line for the “Half-Bar” level, which has an order of five.

²³ The black line, representing songs with beat-level irregularities, is the most dissimilar to the others. Its peak comes earliest (1973–74) and it levels off through the 1990s and 2000s. This may represent a greater prevalence of metric irregularity at low hierarchical levels in the 1970s than adjacent decades, but it could just as easily be an artifact of the smaller numbers recorded for this category than for others.

²⁴ Notably, when we account for the variance in numbers of top-three-charting songs by year (noted above), a larger data set supports the relative prevalence of irregular songs through the 1970s and 80s than does the decline in irregularity in more recent decades. In other words, any inaccuracy in this trend is more likely to be found in the numbers given for recent decades than for earlier decades. The discrepancies between the numerical total and the total as a weighted

Two important observations summarize the results of this survey of *Billboard's* “The Hot 100.” The first concerns popular music writ large; the second regards the corpus in the context of the historical trends we have observed. First, it seems noteworthy that, even in the most commercial repertoire, we encounter representatives of all sorts of metric irregularities. This observation encourages us to reinterpret a pervasive inherited view of popular music, articulated by Ken Stephenson: “Rock normally proceeds in four-bar units just as traditional songs do. In most rock songs, the rigid adherence to this standard . . . contributes to the widely acknowledged perception of a natural, steady—even driving—beat” (2002, 5).²⁵ Stephenson’s assertion about the normativity of four-bar units is true: over 40% of the songs surveyed do indeed rigidly adhere to this standard. Nevertheless, over 55% of songs abandon this “rigid adherence” at least once and often several times (for instance, with every repeat of a formal section). Approximately 12% (or one in eight) of the songs surveyed cannot even be said to maintain a constant meter throughout. It should be borne in mind that this preliminary survey considers only the most popular of pop songs through the past half-century.²⁶ Jocelyn Neal’s observation that “rigorous four-bar phrases and hypermeasures [are] not pervasive in the majority of [country] music and dance” (1998, 323) resonates with the prevalence of songs found in the bar and half-bar categories of my survey.²⁷ Furthermore, as we move towards consideration of only slightly less commercial music, we will see still wider margins of irregularity.

The second point of interest in these data anticipates the corpus. There are three plausible relationships between songs and artists at the pop end of the rock spectrum (represented by the commercial success of artists who chart on “The Hot 100”) and their more transgressive counterparts (represented by my three core artists and the *Wikipedia* list). If the transgressive examples are understood primarily as belonging to the broader pop/rock culture, it is possible that the trend-lines observed for “The Hot 100” hold true outside of that list. A second possibility is that trends towards more normative metric practices in pop (like those observed in the late 1990s and early 2000s) prompt an antagonistic response from the participants in more transgressive scenes,

percentage support the notion that a greater number of (relatively) more irregular songs were surveyed than is evident in the year-to-year breakdown.

²⁵ See also, e.g., Moore (2012, 51–52) and Summach (2012, 17; quoted in n14, above).

²⁶ The earlier quote by Stephenson describes “rock,” but his definition of the term admits of substantial overlap with the pop music represented in “The Hot 100.”

²⁷ Neal later notes that “all of the dances are an even number of beats in length,” suggesting the importance of strong-weak beat alternation for comfortable dance (1998, 332). This remark also corresponds to the pop-music data depicted in **Figure 2.1**.

intensifying the degree of irregularity observed in transgressive rock. In a third scenario, the trends of commercial pop are largely decoupled from those of transgressive rock. Resolving this matter is unfortunately rather difficult, due to the absence of a list of transgressive rock songs analogous to “The Hot 100.”²⁸ However, a partial answer lies in a commercially oriented list of rock songs—*Rolling Stone* magazine’s “500 Best Songs of All Time” list.

***Rolling Stone*’s “500 Best Songs of All Time”**

Like the songs of “The Hot 100,” those of the *Rolling Stone* list span over half a century of popular music; in fact, the *Rolling Stone* list reaches back a decade before the creation of “The Hot 100.”²⁹ Unlike the *Billboard* chart, however, the “500 Best Songs of All Time” offers a rather modest sample—only one quarter as many songs as are considered in **Figure 2.1**, to say nothing of the full contents of “The Hot 100.” Further, a unique complication presented by the *Rolling Stone* list is the disproportionate representation of songs from the mid 1960s to the early 1970s and the corresponding underrepresentation of songs from the 1980s onward. For instance, the year 1965—the most populous of this list—boasts thirty-five songs, more than either of the two most recent decades (twenty-two and twenty-six songs, respectively).³⁰ For the purposes of this chapter, both concerns about the *Rolling Stone* list (its small size and uneven chronological distribution) are mitigated by consulting two additional *Billboard* charts, both of which consider more recent rock releases.

The “500 Best Songs of All Time” list is more eclectic than “The Hot 100,” though it is predominantly focused on rock, rather than pop. Older entries include blues and rock ’n’ roll; the core decade emphasizes folk-rock (most notably Bob Dylan), British invasion, and soul; while more recent inclusions recognize funk, hip-hop, and rock relatives like punk and grunge. While the list is centered somewhere between transgressive rock and pop, representatives of both of those generic

²⁸ We can say with some confidence that metrically transgressive rock has made a mark on the popular music landscape since at least the late 1960s (see, e.g., the several corpus studies in Biamonte 2014, [8.1–8]). The issue is one of combining our knowledge of many individual artists into a comprehensive picture of the past half-century or more. One particularly thorny aspect of this problem is the likely disagreement among listeners over the inclusion of certain artists under the rubric of “transgressive rock.”

²⁹ The full list can be viewed at <http://www.rollingstone.com/music/lists/the-500-greatest-songs-of-all-time-20110407> (accessed December 15, 2016). This 2011 list, which contains songs released as recently as 2009, is a more recent publication than the 2004 version cited by de Clercq and Temperley (2011), Temperley and de Clercq (2013), and Biamonte (2014).

³⁰ In **Figure 2.2** (below), this disparate distribution is accommodated through an uneven chronology, plotted on the X-axis. Songs are grouped according to their year of release, as indicated in the *Rolling Stone* article.

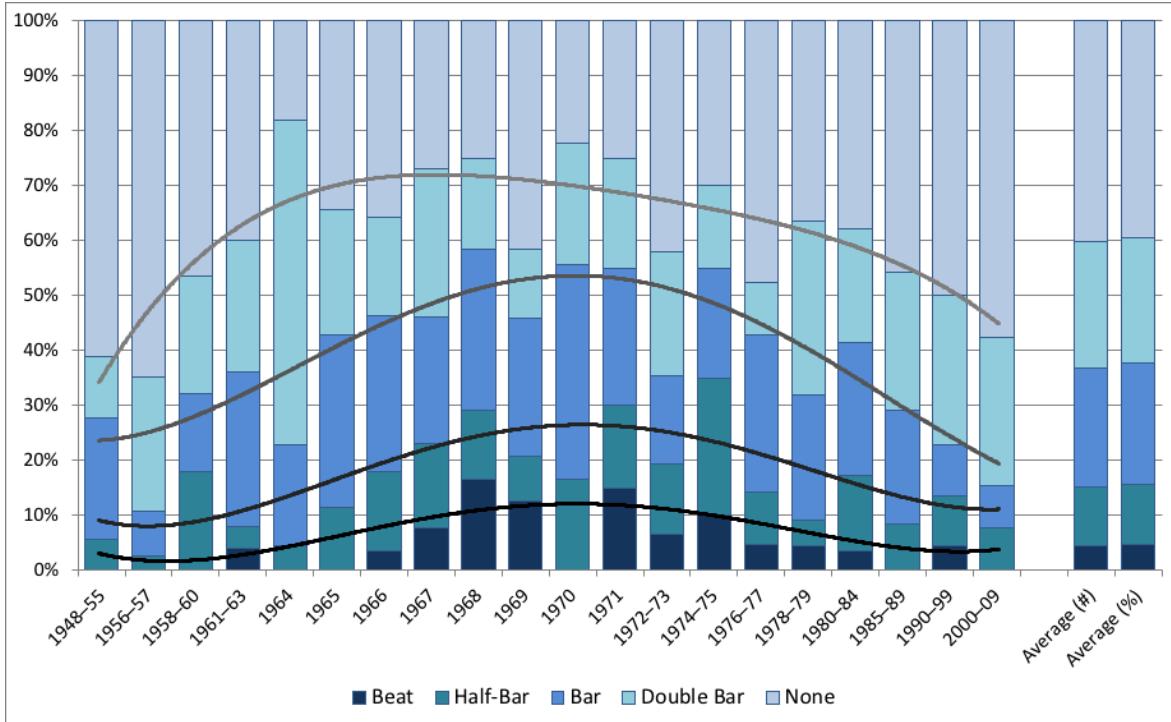


Figure 2.2: Chronology of metric irregularity in *Rolling Stone*'s “500 Best Songs of All Time,” with trend lines.

clusters also appear. From the pop side, 150 of the “500 Best Songs of All Time” are shared by “The Hot 100.” This number may seem significant enough to undermine the rock orientation I claim for the *Rolling Stone* list but, naturally, the songs in question belong to a variety of genres. Metal artists and those at the transgressive end of the rock spectrum contribute substantially fewer entries to the list. Of note, however, is the presence of Radiohead’s “Fake Plastic Trees” and “Paranoid Android”—two of the band’s three contributions to the “predominantly commercially oriented” sources.

The trends in metric irregularity that emerge from *Rolling Stone*'s “500 Best Songs of All Time” (see Fig. 2.2) reflect those of “The Hot 100.”³¹ Irregularity across all hierarchical levels becomes increasingly common through the 1960s, and then wanes in subsequent decades. Within this overall pattern, however, the rock-oriented *Rolling Stone* list distinguishes itself from its pop-centric *Billboard* counterpart in two significant ways. First, all trends shared between the sources materialize earlier in the *Rolling Stone* data than in “The Hot 100.” These trends include not only the initial increase in irregularity (which peaks ca. 1970 in the rock list and as much as a decade later for the pop chart), but also the decline that follows, during which time *Rolling-Stone*-listed songs soon become more

³¹ For this table, the polynomials all have an order of four, responding to the smaller data set.

metrically regular on average than those of “The Hot 100.”³² This point of comparison between the two sources suggests that, while pop and rock are closely related, evolving trends in commercial pop seem to respond to rock antecedents. Second, *Rolling Stone* songs are significantly more likely to be irregular at the beat level (a detailed comparison of all sources concludes this section; see Fig. 2.10). Whereas only about 2.5% of the songs from “The Hot 100” contain beat-level irregularity, the number is almost double (around 4.5%) for *Rolling Stone* entries. Both lists depict a sharp increase in beat-level play through the late 1960s, quickly reaching a peak and then receding. In the *Rolling Stone* list, 1968 and 1971 stand out as the only two years that can boast beat-level numbers of 15% or higher (cf. 1968, 1973, and 1974 in “The Hot 100” at 10–12%). Notably, it is only at the beat level that a clear difference can be observed in the average figures for the two sources; they are otherwise quite comparable. However, while the two lists suggest a general history of metric irregularity within canonical rock and pop, neither gives a clear idea of what to expect from more recent rock (*Rolling Stone* because the data are so sparse, “The Hot 100” because it is concerned with pop). For insight into recent trends, I consider two additional *Billboard* charts.

***Billboard*’s “Alternative Songs” and “Hot Rock Songs”**

The formation of “Alternative Songs” (September 1988) nearly coincides with the beginning of the timespan considered by the corpus, making it a useful resource for contemplating the metric trends of that period. “Hot Rock Songs” is much more recent, originating in 2009. As its name suggests, “Alternative Songs” considers a musical cross-section that is more transgressive than “The Hot 100” and slightly more transgressive than the *Rolling Stone* list.³³ In my understanding of musical genre, the top spots of “Alternative Songs” are dominated by commercially oriented rock songs, like those of the *Rolling Stone* list. In an article celebrating the chart’s twenty-fifth anniversary, *Billboard* acknowledges the shifting generic space embraced by “Alternative Songs”: “The wide-ranging format of 1988 (when the chart debuted with the name, ‘Modern Rock’) turned into a mainstream hard rock sound over time, and then found its way back to its roots.”³⁴ “Hot Rock Songs” considers

³² Beat-level irregularities are an exception in this regard, showing a closer relationship between the two sources; specifically, “The Hot 100” data suggest a curve with a peak in the early 1970s.

³³ As *Billboard* describes it, the list comprises the “most-played adult alternative songs, ranked by radio airplay detections on adult alternative-formatted stations, as measured by Nielsen Music” (<http://www.billboard.com/charts/triple-a>, accessed December 20, 2016).

³⁴ See “Alternative Chart 25th Anniversary: Top 100 Songs,” *Billboard* (2013), <http://www.billboard.com/articles/list/5687158/alternative-chart-25th-anniversary-top-100-songs>, accessed December 20, 2016.

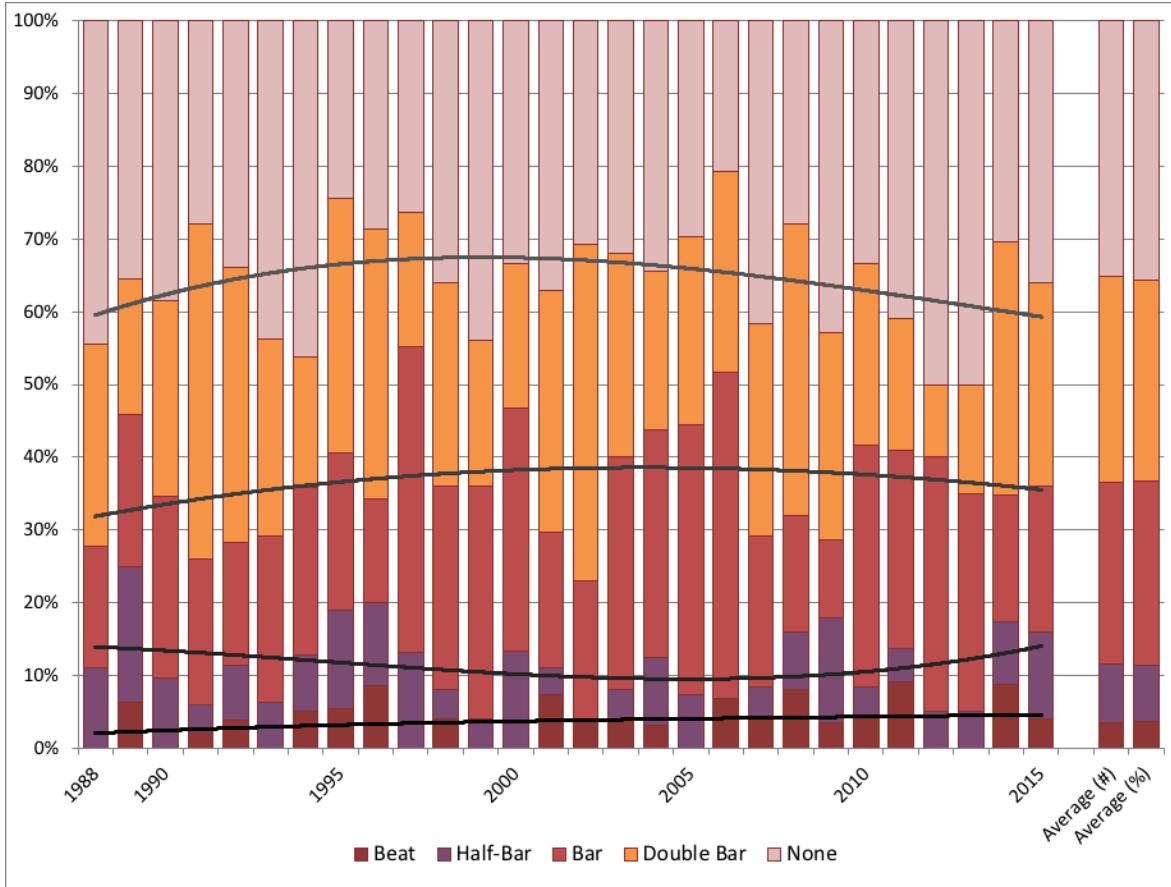


Figure 2.3: Chronology of metric irregularity in *Billboard's* “Alternative Songs,” with trend lines.

a very similar repertoire, both in a general sense—the generic cluster most prevalently represented is the same commercially oriented rock—and in terms of the relatively high number of specific songs shared between the two lists (about twice as many as those shared by “The Hot 100” and the *Rolling Stone* list). Despite this overlap, several artists who are minimally represented on “Alternative Songs” appear frequently on “Hot Rock Songs.” For example, Avenged Sevenfold contributes four songs to the latter chart (none to the former) and Panic! at the Disco makes three appearances in “Hot Rock Songs,” none of which are redundant with their sole contribution to “Alternative Songs.”

In my survey of “Alternative Songs” (see **Figure 2.3**), I track the top five chart positions of each week. There are three reasons why this sampling should be more inclusive (as compared to “The Hot 100”). (1) Given the comparative newness of “Alternative Songs,” it is desirable to have a larger number of entries for each year to ensure a robust data set. (2) Songs that chart on this list tend to retain their position for longer—this may be correlated in some way with the less commercially oriented aesthetic of the songs in question—and this would deplete the data set were it limited to

only the top three entries of each week.³⁵ (3) Finally, and again because of the prevalence of rock songs on this chart, the corpus draws substantially from “Alternative Songs” and this relationship is aided by a larger sample size. Despite my more inclusive criteria, the shorter chronological span of “Alternative Songs” limits my survey to 875 songs—fewer than half as many as “The Hot 100” survey.

Figure 2.3 offers two main insights. First, in comparing the values in the two average columns with those of earlier sources, we find that the figures for “Alternative Songs” are more similar to those of “The Hot 100” than to those of the *Rolling Stone* list (again, see **Fig. 2.10** for a visual comparison). As an ahistorical generalization, this might be seen to suggest that “Alternative Songs” is a less metrically transgressive sample than its generic space would lead us to expect. However, when we consider these numbers in the context of the historical trends observed above, they fit the trend of declining metric irregularity in recent decades. In fact, the “Alternative Songs” numbers reveal somewhat more metric irregularity in recent decades than implied by the *Rolling Stone* list.³⁶ The second insight is that the “Alternative Songs” data do not reveal the same sort of substantive chronological narratives observed in the trend-lines of **Figures 2.1** and **2.2** (i.e., the trend-lines of **Fig. 2.3** are less mobile).³⁷ We might conclude that there is a more consistent distribution of irregularity through the past decades within the rock repertoire represented in “Alternative Songs” but this is difficult to establish conclusively without the full historical context offered by a list like “The Hot 100.” In any case, this relative homogeneity suggests that the attitudes of recording artists and music consumers towards metric irregularity has been relatively stable in the past three decades.

The data from “Hot Rock Songs” (see **Fig. 2.4**) are even more consistent than those of “Alternative Songs” but, because of the short span of time tracked by the newer list, I hesitate to place much emphasis on this apparent trend. The average song from “Hot Rock Songs” is more irregular than that of the other commercially oriented sources and this is true across all hierarchical levels (e.g., beat-level irregularities account for just over 6% of the 240 songs surveyed, compared to only 4.5% for the next most irregular list, *Rolling Stone*).³⁸ What is more, the trend-lines of “Hot Rock

³⁵ The data for **Figure 2.3** include an average of nearly 32 songs per year (excluding the incomplete 1988, with only 18 songs). On average, there is a decline in the number of songs each year over time. This trend is exemplified by the extreme cases: 1992 had the most songs of any year (53), while 2012 and 2013 had the fewest (20 each).

³⁶ When we recall the smaller sample size of the *Rolling Stone* list (only 58 entries over the time spanned by “Alternative Songs”), it becomes clear that the *Billboard* chart is more reliable in this regard.

³⁷ All polynomials have orders of three, again responding to data-set size.

³⁸ As a modest compensation for the short span of the list, I have sampled even more songs from each week of “Hot Rock Songs,” in this case expanding my analysis to include the top ten chart positions.

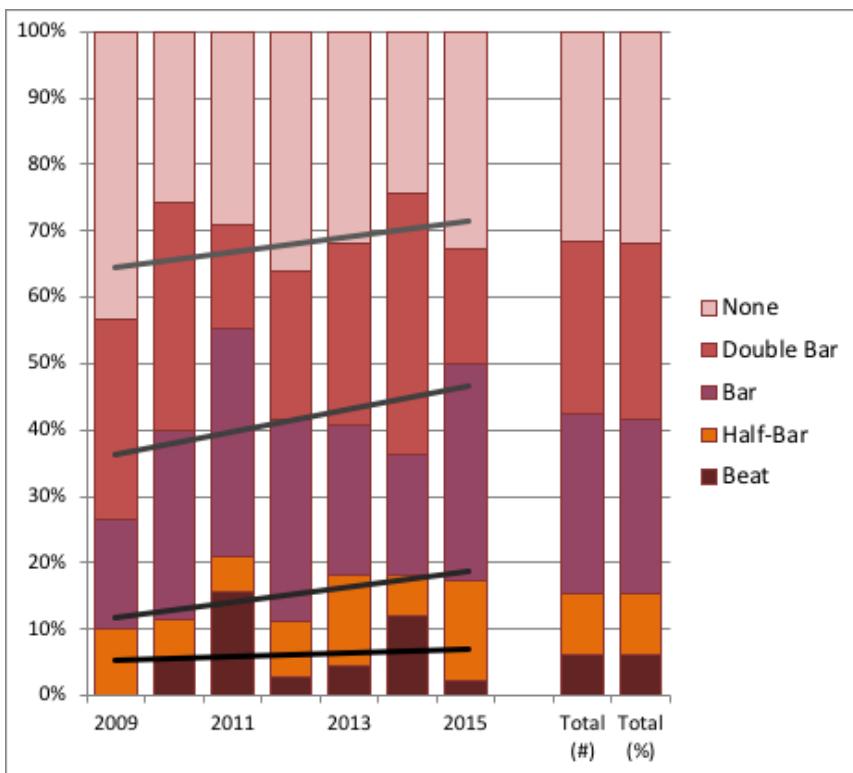


Figure 2.4: Chronology of metric irregularity in *Billboard's* “Hot Rock Songs,” with trend lines.

Songs” show an increase in irregularity over the seven years considered.³⁹ This apparent increase in irregularity is not necessarily surprising; it resonates with the trends of “The Hot 100” over the same years and the beat- and half-bar-levels of the *Rolling Stone* and “Alternative Songs” data weakly suggest an analogous uptick. However, as the bar graph of **Figure 2.4** shows, there is substantial statistical variance or “noise.” It would be interesting to revisit this list in a decade and see if the trend towards irregularity is borne out with time (and more data). If the years in question (2009–15) do indeed mark a resurgence of metric irregularity, then it is possible that the period considered by the corpus is the most metrically regular of the past half-century. Against this historical backdrop, those metrically irregular songs that have achieved commercial success are all the more unique. Likewise, artists who embrace metric irregularity as an aspect of their compositional style are further marked as transgressing a cultural norm. The three core artists of the corpus all fit this description. In what follows, I review their catalogues in turn, demonstrating their enthusiasm for metric irregularity.

³⁹ The use of lines of best fit, rather than the curves employed in my graphics for the other *Billboard* lists, responds to the relative infancy of “Hot Rock Songs” and the resulting dearth of data points.

PREDOMINANTLY TRANSGRESSIVE SOURCES

Tori Amos

Originally from Washington, D.C., Tori Amos experienced her first and most substantial commercial success in the 1990s, recording variously in the Southwest US and in Great Britain. She has resided primarily in Cornwall since early 1997 where she owns a recording studio. Amos's musical eclecticism is motivated by substantial classical training; she is “well known for expressing social and feminist issues in her music” (Burns and Woods 2004, [46]); and she is the most prolific of the three artists considered in detail in this project.⁴⁰ Six of Amos's singles have charted on “The Hot 100” and six on “Alternative Songs” (four overlap). The present survey of her pop/rock output is based on twelve studio albums released between 1992–2014, which together comprise 181 songs—about three-quarters as many as the “Hot Rock Songs” sample in its entirety. **Figure 2.5** summarizes the metric trends within Amos's recordings. Before considering individual albums or chronological patterns in this musical sample, it is striking to compare the average figures of recordings by Amos with those of the *Billboard* sources. Whereas just over 6% of “Hot Rock Songs” entries are irregular at the beat level, around 23% of songs by Amos contain such irregularities. Half-note irregularities bear a similar relationship: 9% of *Billboard*-listed songs fall into this category, as compared with nearly 17% in Amos's catalogue. At least in terms of her metric proclivities, then, it is safe to say that Amos is significantly more transgressive than the average pop or rock artist found at the top of the charts.

Two features differentiate the figures that summarize the discographies of my three core artists from those that treat the *Billboard* charts and *Rolling Stone* list. First, I omit any sort of trend line from the core artist overviews. In part, this move responds to the small number of albums released by each artist (most notable in **Fig. 2.8** below, summarizing Tool's four studio albums). More importantly, the album-to-album variance within the output of a given artist is, in general, much more pronounced than the year-to-year variance in a chart tracking the collected work of many artists. In **Figure 2.5**, for example, an apparent decline in beat-level irregularities beginning with *Under the Pink* (eight of twelve songs) and continuing through *Strange Little Girls* (no songs) is

⁴⁰ On Amos's complex engagements with feminism and performative femininity, see also Mayhew 2001. Regarding her prolific output, two of Amos's full-length studio albums (*Night of Hunters* [2011] and *Gold Dust* [2012]) have been omitted from this overview on the grounds that they (a) belong only loosely to the pop-rock generic complex and (b) do not include the drum kit in their performing forces (see below for more on the role of drums in the corpus); despite this, Amos contributes significantly more songs to the corpus than either Radiohead or Tool.

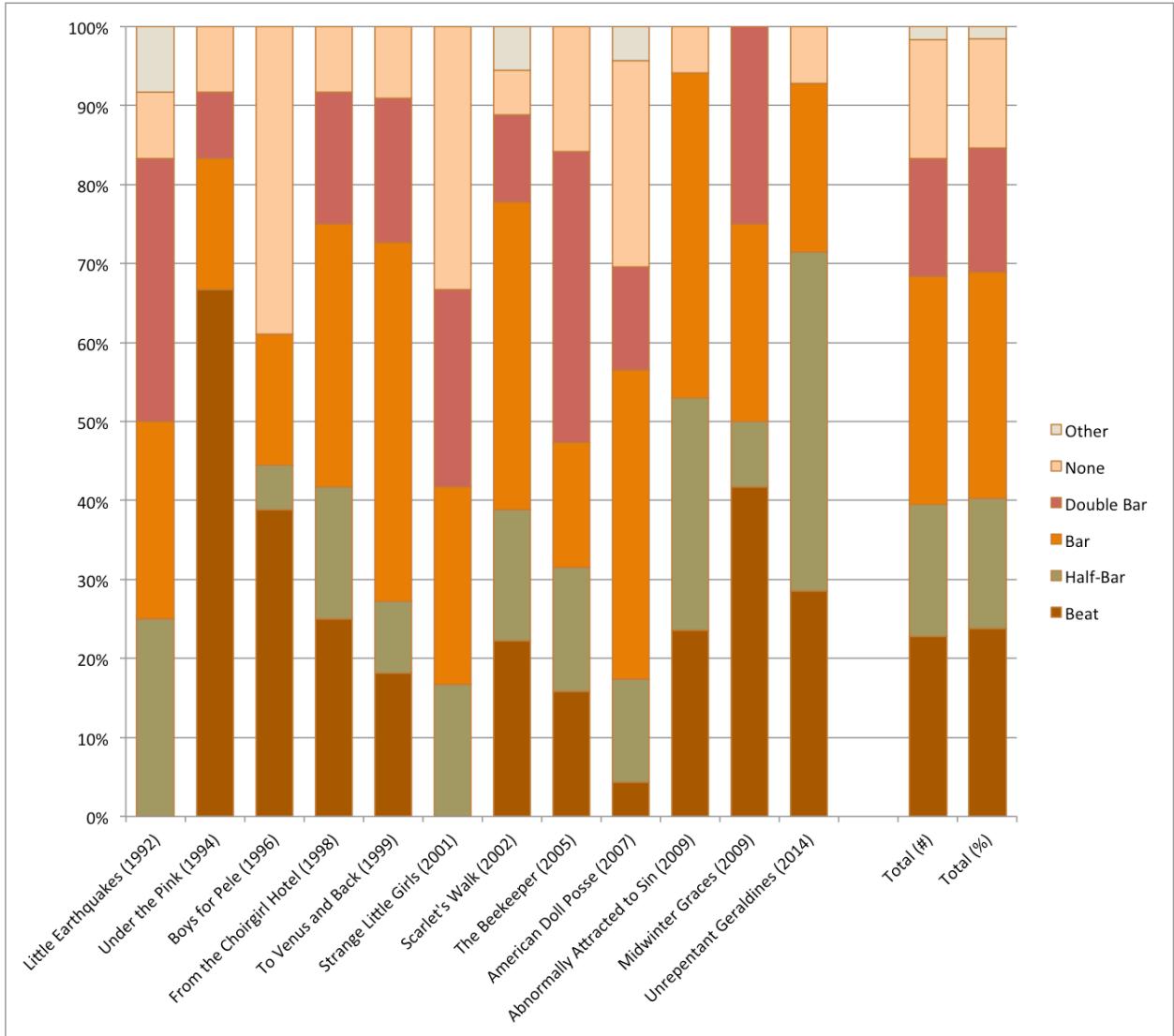


Figure 2.5: Chronology of metric irregularity in full-length studio albums by Tori Amos.

perhaps the most consistent and most easily observed trend. Yet this trend does not continue—if anything, it is reversed in Amos’s more recent releases—and the subsequent data become considerably noisier. Moreover, when considering other hierarchical levels, it is impossible to argue any degree of chronological predictability (see, e.g., the pale orange bars, representing fully regular songs; most albums have exactly one such song but *Boys for Pele* and *American Doll Posse*, recorded over ten years apart, have seven and six, respectively). The addition of trend lines would therefore only clutter these figures unnecessarily for readers interested in comparing albums to one another.

The second feature of these core-artist overviews is the addition of an “other” category, which accommodates spoken word tracks, ametrical instrumentals, and soundscapes. None of these approaches is typical of music that generates large-scale commercial success, but all are encountered

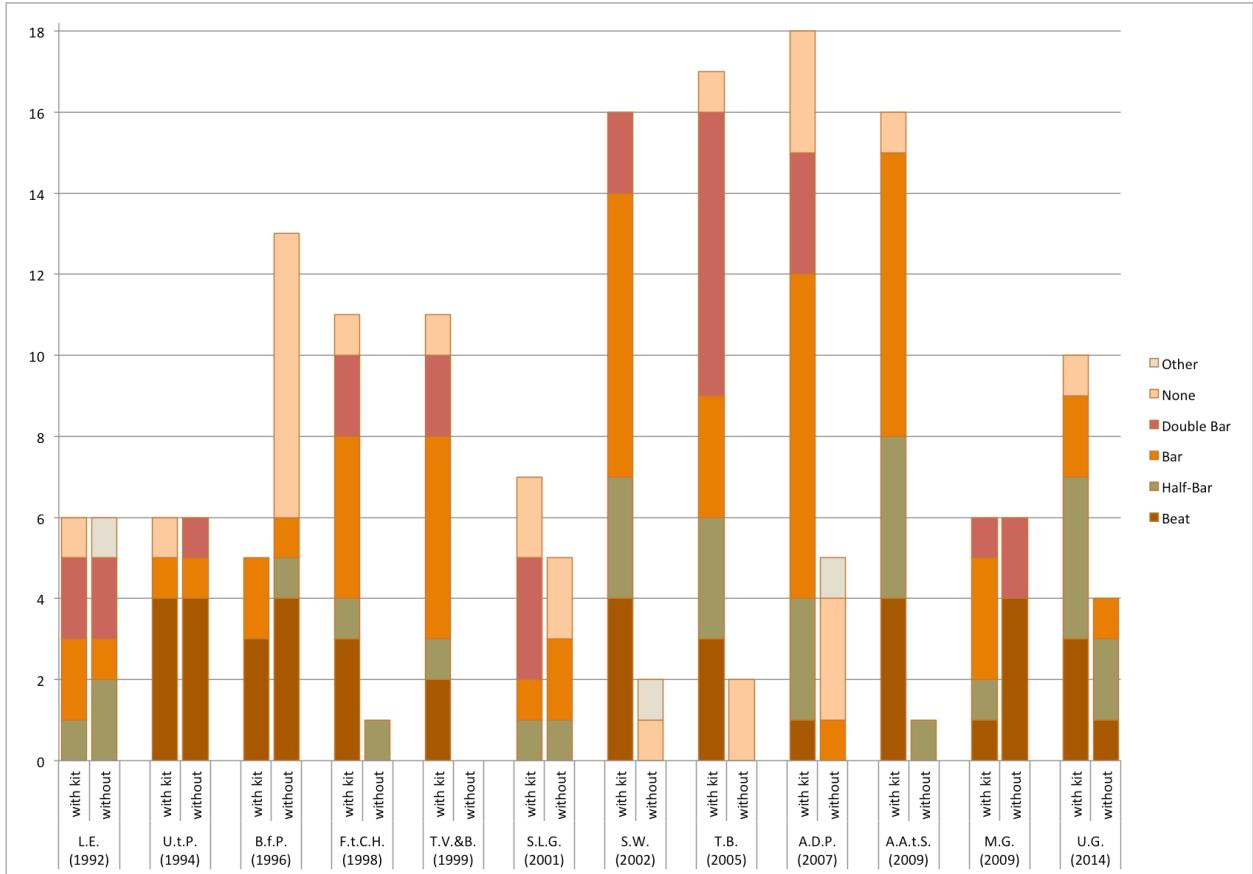


Figure 2.6: Comparison of irregularity in songs with and without drum kit by Tori Amos.

in the work of the three core artists. While relatively few tracks from Amos's catalogue belong to this added category, her production practice often includes songs without accompaniment and—especially notable for the present study—without drum kit.

Figure 2.6 incorporates an additional detail regarding the songs of Amos's twelve full-length, pop and rock studio releases: each album is represented by two bars, the first describing songs with drum kit, the second those without. While the albums in question are sometimes characterized by radically diverse interactions between metric irregularity and instrumentation, Amos's practice does not seem to correlate irregular experimentation with the presence or absence of the kit. Seven albums contain four or more songs without drum kit (or over 20% of the album). In two of these, songs with kit still largely outnumber those without; of these two, *American Doll Posse* (2007) finds all intense metric irregularities in songs with kit, whereas *Unrepentant Geraldines* (2014) offers a remarkably even distribution. Four albums contain the same or approximately the same number of songs with and without kit: Amos's two earliest releases incorporate metric irregularity evenly into both instrumental categories; *Strange Little Girls* (2001) contains rather few irregular songs; and, in

Midwinter Graces (2009), we find markedly more irregularity when the kit is absent. Finally, *Boys for Pele* (1996) has the least involvement of the drum kit by far and, while metric irregularity is found in plenty of songs regardless of instrumentation, those with kit are proportionally more likely to be irregular.

The album-to-album diversity observed in this overview, coupled with the great volume of Amos's creative output, is suggestive of the artist's abundant imagination. As we explore Amos's work in greater detail (especially in subsequent chapters), we will see that this great expressive potential is rooted in a surprisingly consistent set of recurring compositional strategies and metric proclivities.

Core Artist—Radiohead

The English rock group Radiohead is often recognized for its experimental- and art-rock contributions to the alternative rock soundscape—generic extensions whose influence can be heard echoed in the work of countless post-millennial groups. Only three Radiohead singles have charted on “The Hot 100,” but an impressive fourteen are found on “Alternative Songs” and a further four on “Hot Rock Songs.”⁴¹ Osborn (2017, vii) links the band’s “commercial success [to] an ability to write music that balances expectation and surprise.” This observation finds evidence in Radiohead’s use of metric irregularity (see **Figure 2.7**); the band’s output stands midway between the trends observed in the commercialist sources and Amos’s more metrically transgressive recordings. Radiohead’s eight full-length studio albums comprise eighty-nine songs, of which twenty-four (or nearly 27%) are irregular at the half-note level or lower—twelve at the half-note level, another twelve at the sub-beat or beat level. As with Amos’s recordings, I hesitate to assert too strongly that any overarching patterns can be reliably observed in the metric irregularities found in Radiohead’s music over the course of their career. Two exceptions do bear mention. First, the few songs that belong to the category “other” are clustered neatly together in albums surrounding the turn of the millennium.⁴² Second, and more robust, Radiohead’s songs evince a reasonably consistent chronological increase in beat-level irregularities. This observation contradicts a common criticism levied by listeners—namely, that as Radiohead has matured their music has become less overtly

⁴¹ Radiohead is also the only core artist to appear on the *Rolling Stone* list, to which they contribute “Fake Plastic Trees” and “Paranoid Android.”

⁴² It hardly seems worth speculating as to the significance of this grouping, as only four Radiohead songs belong to this category. Likewise, as only five of the band’s 89 songs have no drum kit (either acoustic or electronic) I do not give the same attention to instrumentation in Radiohead’s recordings as I did those of Amos.

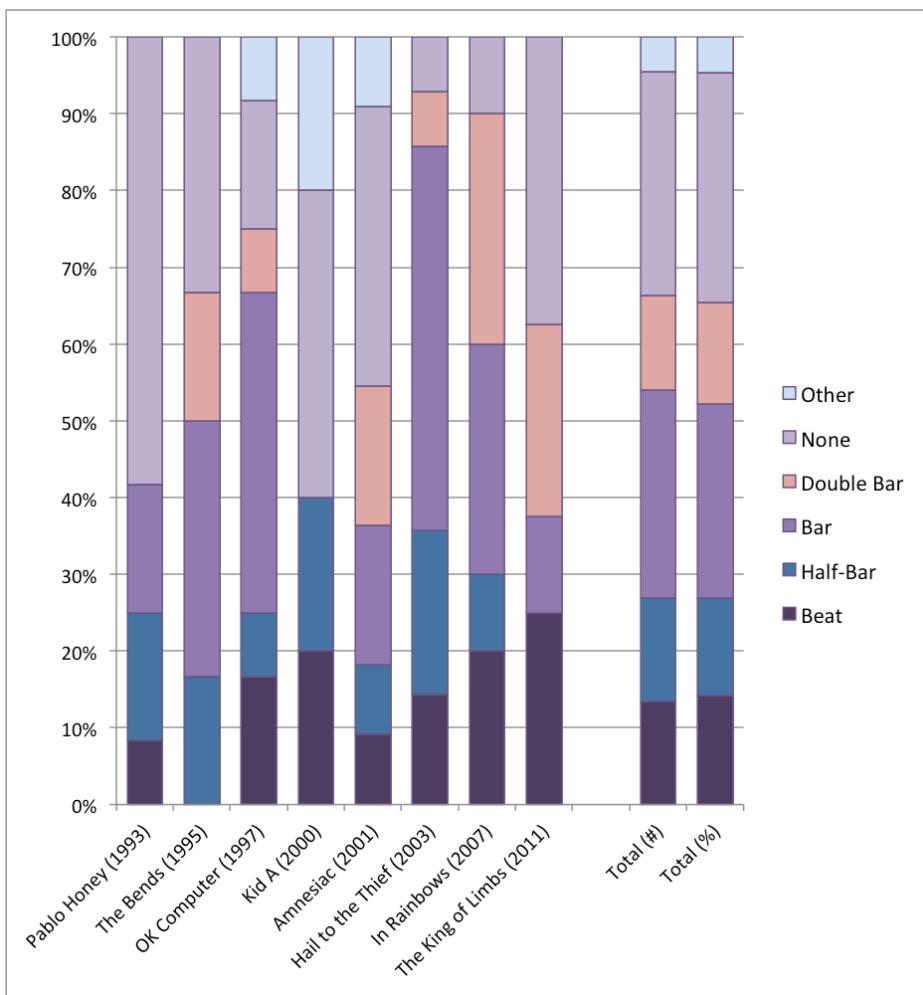


Figure 2.7: Chronology of metric irregularity in full-length studio albums by Radiohead.

experimental.⁴³ It would seem that, at least in terms of surface-level metric experimentation, this critique is demonstrably false.

Core Artist—Tool

As noted above, California-based Tool occupy an ambiguous generic space: they fall near the intersection of alternative metal and progressive rock but also display significant psychedelic and art-rock elements (e.g., in their iconic album artwork). Like Radiohead, Tool’s best chart success has been on “Alternative Songs” where seven of their recordings have charted (one of these, “Schism”

⁴³ Moskowitz (2016, 507) summarizes this view in a comparison of *Amnesiac* (2001) to *Kid A* (2000). If I Had an Orchard blogger Drew writes of *In Rainbows* (2007), “This is a Radiohead that is less fussy and more accessible than they have been since *The Bends*, and it had to be a nice break from the experimental side for even their most ardent fans.” (See “A Perhaps Unnecessarily Comprehensive Attempt to Finally Like Radiohead,” August 21, 2014, <https://dwendt212.wordpress.com/2014/08/21/a-non-radiohead-fans-guide-to-radiohead/>, accessed January 22, 2017.) Also, see posts in numerous other online forums.

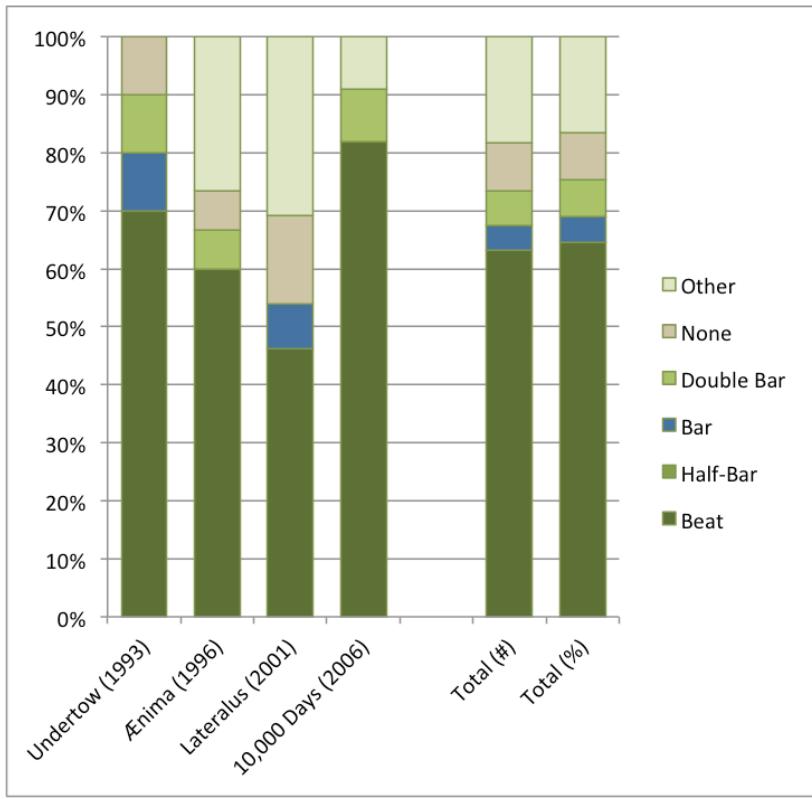


Figure 2.8: Chronology of metric irregularity in full-length studio albums by Tool.

[2001] also appears on “The Hot 100”). Though least prolific of the three artists considered here, having released only four full-length albums between 1993 and 2006, Tool is the most metrically experimental of these core artists by a wide margin.⁴⁴ The group seems especially interested in exploring the spaces at either end of the metric spectrum (see **Figure 2.8**). A large majority of Tool’s metrically irregular excursions concern the beat level and below: of the forty-nine songs that make up the group’s four full-length studio albums, thirty-one (over 60%) contain such metric irregularities. In fact, in twenty-four of these (nearly half of the total sample) irregularities permeate down to the sub-beat level. The next most pervasive category in Tool’s output (accounting for around 17–18% of their work) is the ametric “other” catch-all; in the case of Tool, this category is largely represented by soundscapes and meditative drones, many of which serve as introductory preludes, running *attacca* into songs with standard rock instrumentation (i.e., including drums). Metrically regular songs in which a clear beat is articulated constitute a minority of Tool’s work and

⁴⁴ They occupy a similar position in Biamonte’s (2014) study. As she writes, Tool’s “is the most metrically dissonant corpus, since the band’s style is the most progressive among those considered here, and they are well known for their use of asymmetrical and changing meters” (2014, [8.7]).

“mildly irregular” levels are the least common. For example, this survey counts only two songs with bar-level irregularities and none categorized at the half-note level.

Wikipedia’s “List of musical works in unusual time signatures”

The “List of musical works in unusual time signatures” and its ancillaries (the entries for “Septuple meter” and “Quintuple meter”) contain approximately 400 entries that range from classical compositions, through diverse if under-represented musical traditions across the world, to Euro-American jazz and popular music (including several examples from film and, more recently, from video games).⁴⁵ Of these, around 140 belong to rock, pop, or a related genre (metal being next most common), representing over 85 different artists.⁴⁶ While Radiohead and Tool both make appearances in these lists (with two and four songs, respectively, at the time of writing), they are overshadowed by former Police frontman Sting and British math-rock group TTNG (with six songs each), and by psychedelic rock group the Grateful Dead and progressive metal pillar Dream Theater (five each); the Beatles contributes only as many songs as Tool (four), as does Canadian progressive rock group Rush. Tori Amos is conspicuously absent from the *Wikipedia* lists—female artists are underrepresented in general.⁴⁷ Only thirteen of the eighty-plus artists and groups (or less than one in six) have ever counted a woman among their membership and only eight of these are fronted by female musicians or count women in the regular line-up. Beyoncé, Björk, Blondie, the Mothers of Invention, the Pretenders, Siouxsie and the Banshees, Tori Kelly, and Vanessa Hudgens are the exceptional few recognized by *Wikipedia*’s editors.⁴⁸

In considering metric irregularity within the *Wikipedia* lists, highlighting trends according to hierarchical level is unnecessary; this is because, by definition, inclusion in these lists is ostensibly limited to songs with beat-level irregularity. From the parent article: “‘Unusual’ is here defined to be

⁴⁵ The relevant URLs are https://en.wikipedia.org/wiki/List_of_musical_works_in_unusual_time_signatures, https://en.wikipedia.org/wiki/Septuple_meter, and https://en.wikipedia.org/wiki/Quintuple_meter, respectively; all were consulted on numerous occasions from 2015–16 and occasional additions to and deletions from the lists were observed during this period. My use of an approximate figure to represent the total number of songs in these lists reflects this fact, as well as the vagaries of, for example, folk dances with shared metric patterning but myriad unique songs (in the *Wikipedia* article, it is typical of authors to name only the dance), or classical pieces in which irregular meter is identified in multiple movements. For categorization of entries to the quintuple and septuple lists according to metric subdivision, see Murphy (2016, [2.16] and Appendices A and B).

⁴⁶ The exact figures were 139 songs from 86 artists on November 30, 2016 but, as noted, some variance is endemic to lists like these.

⁴⁷ On the underrepresentation of women in *Wikipedia*, see Wagner et al. (2016, 8–13).

⁴⁸ Ruth Underwood’s status as a regular member of The Mothers of Invention is somewhat debatable but she is certainly more of a mainstay than most among the group’s ever-changing personnel.

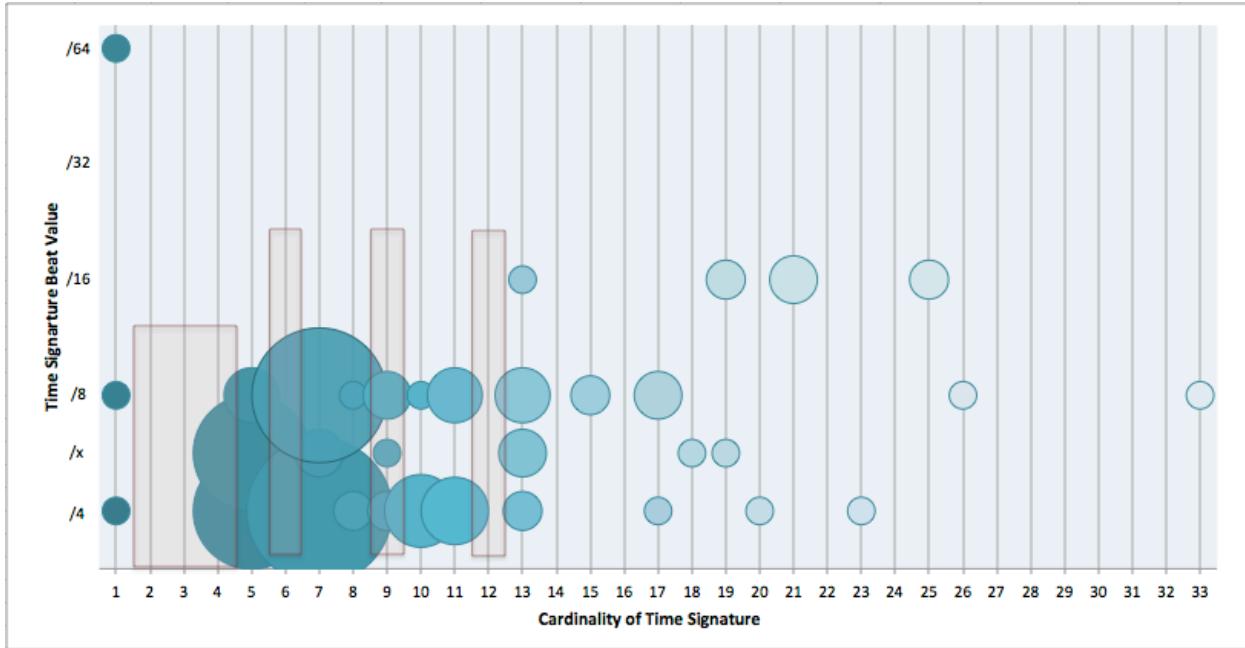


Figure 2.9: Typology of metric irregularity in *Wikipedia*'s “List of musical works in unusual time signatures.”

any time signature other than simple time signatures with top numerals of 2, 3, or 4 and bottom numerals of 2, 4, or 8, and compound time signatures with top numerals of 6, 9, or 12 and bottom numerals 4, 8, or 16.” In fact, a small minority of the listed songs are not irregular at the beat level but rather at the half-note level (this happens, for example, when a contributor identifies a song in 5/2 time).⁴⁹

While a chart like those used to summarize other sources in this chapter would reveal little of substance about the *Wikipedia* lists, metric variety can be interrogated in this source according to the relative frequency with which different time signatures are encountered. **Figure 2.9** summarizes the time signatures identified in the “List of musical works in unusual time signatures” and tallies the number of songs in which each is acknowledged. Whereas the *Wikipedia* entry is organized by cardinality, I reframe the data, separating entries according to level of irregularity. In some cases, *Wikipedia*'s cardinality-oriented grouping of songs leads to entries with incomplete metric identification (e.g., three songs under the heading “Partially in 13/4 or 13/8” do not designate a value for the beat); such examples are grouped separately in the row labeled “/x,” located midway between the rows of time signatures with beat values of a quarter note (“/4”) or eighth note

⁴⁹ One advantage of prioritizing questions of hierarchy in evaluating irregular meters is the avoidance of circuitous discussions of whether a groove is in 5/2 time or consists of five-measure groups of 2/4. Both descriptions make clear the importance of quintuple cardinality but only the former is recognized under the conventions of the *Wikipedia* source.

(“/8”).⁵⁰ A circle at the intersection of a time signature’s cardinality and beat value represents the identification of one or more songs that use that meter; the size of the circle corresponds to the number of entries. The four light-brown rectangles demarcate the area that would be occupied by songs in the simple and compound time signatures noted above—songs, that is, that are not permitted in the list.

As might be expected, most of the rock songs on “List of musical works in unusual time signatures” are in either septuple time (fifty-three entries) or quintuple (forty entries). *Wikipedia* contributors seem more confident in assertions about tactus level that concern septuple meters than quintuple; only three songs are left ambiguous in the septuple list, while eighteen are not assigned a beat value in the quintuple. One plausible explanation for this discrepancy is that the drumbeats of quintuple meters are more varied than those of septuple grooves, as I demonstrate in Chapter 4. The next most common time signatures on the *Wikipedia* list are those with cardinalities ten, eleven, and thirteen, continuing to fill out the chart space adjacent to the (more common) compound meters. Higher-cardinality meters become progressively less common, likely due in no small part to the ample combinatorial potential of large integers. We also observe that smaller beat values are modestly more likely to accommodate higher cardinality meters. For example, both listed songs with meters of cardinality twenty-five are in 25/16 time, whereas none of the identified five- through eleven-beat meters have a sixteenth-note tactus. Finally, note that three entries have a cardinality of one. Although single-beat signatures are occasionally found in notated music, it seems unlikely that the most intuitive hearing (or *descriptive* transcription) of such musical events would separate out single-beat measures. The counterintuitive nature of such hearings likely accounts for their relative rarity on the list.⁵¹

Summary

By way of concluding my discussion of the various sources for this project, a comparison of the average figures for each helps to situate the three core artists within a broader soundscape of pop and rock music (see **Fig. 2.10**). Note that the last source discussed, the *Wikipedia* list, is not present

⁵⁰ It is of course impossible to establish whether the original contributor intentionally avoided full identification of the perceived meter—implying a degree of ambiguity—or simply neglected to offer a complete entry. I avoid offering my own metric interpretations at this time in an attempt to present the original source material with as little mediation as possible.

⁵¹ The use of 1/64 time to describe measures of Ron Jarzombek’s “A Headache and a 64th” (2002) is exceptional in this regard as it actually clarifies that the meter arises through recurring interpolations among measures of 4/4 time.

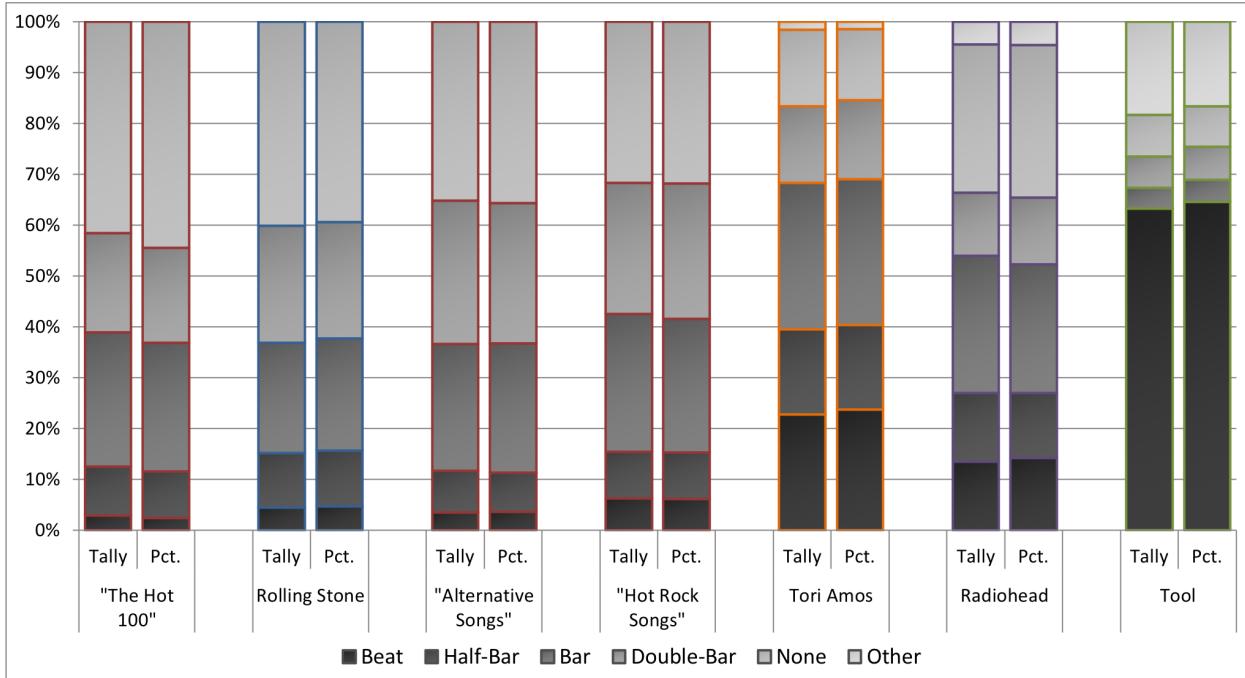


Figure 2.10: Comparison of metric irregularity by level in three *Billboard* charts, *Rolling Stone*'s “500 Best Songs of All Time,” and three metrically transgressive rock artists.

in the chart as its songs are all ostensibly irregular at the beat level (or lower).⁵² Among the seven sources compared, a clear distinction is evident between the more metrically irregular core artists (on the left) and the more commercially oriented, largely regular collections (right to center). The *Billboard* and *Rolling Stone* numbers reinforce several general trends: pop (“The Hot 100”) is typically more regular than rock (the other three); the most recent rock (“Hot Rock Songs”) is more irregular than the average (*Rolling Stone*); and persistent foursquare hypermeter, while by no means uncommon, is less pervasive than some accounts have implied. As for the core artists, Radiohead’s practice most closely resembles the trends of the consumer charts, but even in their music we find numbers for the most irregular categories (beat- and half-bar-levels) that are nearly double those of the most irregular rock chart (“Hot Rock Songs”). By the same indicators, Amos’s work is nearly twice as irregular as that of Radiohead and fewer than half as many of her songs are fully regular. Tool’s style is even more thoroughly indebted to metric irregularity, especially at the beat level, which they exploit more than four times as often as Radiohead and nearly thrice as often as Amos. With these trends in mind, the next section details how individual songs are collected from such diverse sources, forming the central corpus of this project.

⁵² As will become clear in subsequent pages, I believe that certain songs from the *Wikipedia* list are better analyzed as irregular at the half-note level.

ESTABLISHING THE CORPUS

The 240 songs of the corpus, representing 111 different artists, are gathered from the sources outlined above and united by several defining features. In this section, I explain my conception of the corpus, establish its boundaries, and detail its relationship to the sources.

My broad goal in forming this corpus was to create a collection more focused than the broadest, historical sources (e.g., *Billboard's* “The Hot 100”) but more comprehensive than the output of a single artist (or several)—a collection of appropriate breadth and depth to afford sustained inquiry into the nature of irregular meter in recent rock. The formation of the corpus was somewhat paradoxical as it was simultaneously (1) an early goal of this project, retained throughout my exploration of the many sources above and (2) impossible to conceive fully without first acquainting myself closely with those same sources. Several priorities guided the selection of songs and have contributed to a rather eclectic result. I hasten to add that, in my view, this eclecticism should not be seen as a shortcoming; rather, I hope that the songs I have collected succeed in representing a substantially broad view of rock music, necessarily limited to a given historical span and by a (deliberately and unavoidably) fuzzy definition of genre.

The full list of songs that constitute the 240-song corpus is given in Appendix I; more informative than a simple list, however, is an explanation of the criteria that resulted in this specific set of songs. In addition to an adherence to chronological and generic limitations, songs in the corpus are roughly alike in terms of instrumentation and the hierarchical level of their metric irregularities. Some of these criteria respond primarily to the goal of interrogating metrically irregular phenomena, while others ensure a degree of commonality between the repertoires of the three core artists and the songs from the *Billboard* and *Wikipedia* lists. It is important to me that these boundaries are, on the one hand, clear and consistent and, on the other, supple enough to accommodate the inevitable difficult examples. The relative absence of such delineations in colloquial forums—fandom, media coverage, radio play, magazine criticism, etc.—and the arbitrary nature of those that do appear, bespeak the difficulty of this task.⁵³ While the limits chosen for my corpus will not reflect the musical intuitions of every reader, the following explication should allow the boundaries in question to clarify my criteria for song selection, aiding those wishing either to extend my survey or to compare songs or artists not considered in the present work.

⁵³ The situation today, in which many such forums are accessible online (to varying degrees), simultaneously grants new avenues of access to researchers and increases the overall complexity of the landscape.

First, and least ambiguous, are the chronological boundaries of the corpus: all the collected songs were released in the quarter century spanning 1991–2015. Whereas my earlier review of the *Billboard* sources prioritized songs’ popular reception (i.e., the year in which a song reached a given chart position), in the context of the corpus it is both necessary and desirable to consider release date instead—necessary because many of the songs have never charted on lists based on sales or radio play; desirable because, when I consider chronological trends within the corpus, my concerns are more poietic (regarding the creation of sounds) than esthetic (concerning the reception of sounds).⁵⁴ The close of the corpus at 2015 is a necessity of the writing process and unfortunately fails to include some relevant music; at the time of this writing, for example, Radiohead has released a ninth studio album (*A Moon Shaped Pool*, 2016), Amos a fifteenth (*Native Invader*, 2017), and fans have been expecting a fifth Tool essay (*Deem*) for several years.⁵⁵ The initiating boundary of 1991 is, on the contrary, an intuitive choice.⁵⁶ Although the earliest album by any of the three core artists (Amos’s *Little Earthquakes*) was released early in 1992, two singles from that album had been released in the previous year (“Me and a Gun” and “Silent All these Years”). Additionally, the *Billboard* “Alternative Songs” and *Wikipedia* lists—the only two sources that contribute substantially to the corpus in the early 1990s—offer comparatively few tracks that would otherwise qualify from the year 1990. The omission of songs from that year (and previous years) thus distorts by only a minimal amount our view of any trends observed in the earliest years of the corpus.

Second, the corpus considers only songs with irregularities at the half note level or lower—a rather severe restriction. Most songs (especially those found in commercially oriented sources) are already disqualified by this single consideration. This severity thus has the desired effect of focusing the collection towards a subset of less common metric irregularities. The hierarchy-based limitation also has the benefit of avoiding discrimination based on context (formal, generic, etc.), with the result that a wide variety of metric phenomena are collected together. Naturally, some situations are ambiguous in this regard and I include such ambiguous cases (examples are offered throughout Parts II and III). This inclusive attitude is applied to all of the boundaries in question.

⁵⁴ My use of these terms follows Nattiez (1990).

⁵⁵ See Sahash Khanal, “New Tool Album: Danny Carey Says New Album ‘Coming Sometime Soon,’” *Inquisitr*, September 29, 2016, <http://www.inquisitr.com/3550548/new-tool-album-danny-carey-new-album-coming-soon-rumors-tool-maynard-james-keenan-justin-chancellor/>, accessed December 8, 2016.

⁵⁶ The same year serves as a boundary for studies by Burgoyne (2011, 131), Summach (2012, 13–14), and de Clercq (2017, [1.7]).

A third criterion, perhaps the most idiosyncratic of this study, limits the corpus according to some very basic questions of instrumentation: the collected songs all include both vocals and drums. The latter requirement stems from one of the stated goals of this project—the study of drum parts in metrically irregular contexts. From this perspective, I make no distinction between the acoustic drum kit and electronically generated drums.⁵⁷ More problematic is the question of what to do with songs that include a drum part but in which the drums are not present during moments of metric irregularity. In some cases, it is relatively easy to separate an instance of irregularity from the drum part of a song. In Amos’s “Spring Haze,” for example, metrically irregular sections without kit (including a good deal of septuple meter) alternate with sections with kit in compound duple time; the song is not counted within the corpus.⁵⁸ In other cases, when an isolated moment of metric irregularity occupies a brief absence of the drum part, separating the irregularity from the drums proves more contentious; such examples are included in the corpus.⁵⁹

The requirement that all songs have a vocal component aids in retaining some commonality between the most transgressive songs and the most commercial.⁶⁰ In the work of many progressive artists, we find both virtuosic instrumental displays and intense metric experimentation; the correlation of these musical features results not infrequently in prominent metric irregularities within fully instrumental tracks. This correlation, however, does not hold in the work of my three core artists (though it does characterize some entries on the *Wikipedia* list). Relatively few songs by Amos, Radiohead, or Tool are entirely instrumental and much of their most metrically interesting work occurs in songs with words. Ascertaining the difference between sung and instrumental sections within the same song is a more complicated matter—one that receives some attention in Chapter 6. In any event, the requirement of a vocal part has only a nominal effect on the sample.

⁵⁷ Given the role of technology in current record production—including production of the acoustic drum kit—any such distinction is becoming increasingly difficult to maintain with consistency.

⁵⁸ Because drums are absent from a substantial part of her catalogue, Amos’s inclusion in the corpus suffers disproportionately due to the instrumentation-based criterion. To a certain extent, Amos’s generous compositional output mitigates this effect. Nevertheless, research that goes beyond the bounds of the present study and considers metric irregularity in Amos’s entire catalogue holds much promise. My analysis of “Icicle” (see Chapter 7) is representative of the complications that arise in the absence of a drum part.

⁵⁹ Many such “drop outs” in the drum part constitute the effect of a written-out fermata—most commonly, a single half note invades an otherwise common-time metric fabric. A well-known example occurs in Oasis’s “Wonderwall” at the end of the first chorus, shortly before the two-minute mark. For a discussion of the theoretical underpinnings of written-out fermatas and examples from the classical canon, see Rothstein (1989, 80–87). I consider examples from the corpus in Chapter 6.

⁶⁰ Although a potential distinction could be made between songs with vocals and those with lyrics, in practice none of the potential candidates for inclusion in the corpus necessitated this distinction.

[audio ex. only]

Example 2.1: Second verse and chorus of Taylor Swift’s “I Knew You Were Trouble” (2012).

[audio ex. only]

Example 2.2: Second verse and chorus of Miley Cyrus’s “Wrecking Ball” (2013).

My final criterion is that the songs of the corpus belong to rock or one of its innumerable subgenres. This was the most difficult to maintain and has led to some of the most contentious inclusions and exclusions. Following my argument that the inherent complexities of defining rock demand an element of intuitive sense, I offer two examples against which readers may test their intuitions and discern to what degree they align with the decisions I have made. I focus on the two most relevant boundaries that emerged in curating the corpus—rock vs. pop and rock vs. metal.

Regarding the boundary between rock and pop, consider the second verses and choruses of “I Knew You Were Trouble” by Taylor Swift and “Wrecking Ball” by Miley Cyrus (**Examples 2.1** and **2.2**, respectively). Both songs charted in the “Hot 100” in 2013 and both excerpts share numerous musical features: the verses contain only modest percussive elements, building gradually through the addition of mid-register textural layers and bass, while the choruses make dynamic entries, fill the sonic spectrum with more robust drum and bass production, and feature emphatic, half-time drumbeats. Despite these similarities, I can much more easily hear Swift’s song as rock than Cyrus’s, a difference that I attribute primarily to two production elements. The first is Swift’s pervasive use of guitar, as in the verse tresillo comp and the reverb-drenched countermelody in the verse’s second half (in “Wrecking Ball” the same textural roles are assigned to synth and piano, respectively). The second is the distortion of the bass synth in the chorus—the signal takes the shape of a fuzzy square wave (whereas Cyrus’s bass is a smoother sine signal). Swift’s distorted bass sound is not strictly speaking a rock element; rather, it is associated with a “hard” electronic sound that has been coopted by rock in recent years.⁶¹ I should clarify that I am not arguing that “I Knew You Were Trouble” is a rock song while “Wrecking Ball” is not. But to my ear, the former approximates the rock aesthetic closely enough to be counted in the corpus.⁶²

⁶¹ For discussion of rock’s eclectic borrowings from and coopting of other generic practices, see Straw (1991).

⁶² I would be reluctant to base assertions of genre exclusively on *Wikipedia*’s labels but, in this case at least, my intuition is borne out in the court of public opinion. Whereas the *Wikipedia* page for “I Knew You Were Trouble” lists “electropop, dubstep, [and] pop rock” under genre, “Wrecking Ball” is identified only as “pop.” See https://en.wikipedia.org/wiki/I_Knew_You_Were_Trouble and [https://en.wikipedia.org/wiki/Wrecking_Ball_\(Miley_Cyrus_song\)](https://en.wikipedia.org/wiki/Wrecking_Ball_(Miley_Cyrus_song)), both accessed December 3, 2016.

[audio ex. only]

Example 2.3: End of intro and beginning of first verse of Dream Theater's "A Nightmare to Remember" (2009).

[audio ex. only]

Example 2.4: End of intro and beginning of first verse of Between the Buried and Me's "Prequel to the Sequel" (2007).

A second relevant boundary lies between two more transgressive generic clusters: the first comprises progressive rock and alternative metal (Tool is typically identified here); the second includes subgenres like death metal and progressive metal. Two songs from the *Wikipedia* list, Dream Theater's "A Nightmare to Remember" and Between the Buried and Me's "Prequel to the Sequel," offer an apt comparison. **Examples 2.3** (from "Nightmare") and **2.4** (from "Prequel") each excerpt the end of an extended instrumental introduction and the first few lines of an initial vocal entry. Both passages combine elements of rock and metal. In "Nightmare," the natural production of the acoustic drums (a rock feature) complements a low-register guitar riff in drop-C tuning, double-tracked, hard-panned left and right, and doubled again by bass an octave lower (production practices that are characteristic of metal). In "Prequel," an insistent double-kick drum part in sixteenth notes (metal) necessitates the clarion equalization of a guitar ostinato—the resulting timbre is typical of rock or pop punk. Given the diverse timbral makeup of this generic space and the presence of free borrowings from myriad other genres ("Prequel," for example, contains an extended breakdown with accordion accompaniment), I classify examples like these according to vocal delivery. I consider songs with sung vocals, like the Dream Theater example, closer to rock and include them in the corpus; songs with screamed vocals, including a few by Between the Buried and Me, fall closer to the metal cluster and are excluded.

Both of the above pairs of examples demonstrate the difficulties in delineating generic boundaries consistently. Ultimately, some decisions will always be debatable, but the exact limits of the corpus are less important than having compiled a robust sample of metrically irregular songs. The criteria outlined allow the identification of a 240-song corpus within the combined contents of the five lists and the catalogues of three artists introduced earlier (see **Table 2.1**). 102 of these songs come from the predominantly commercially oriented sources: seventy-seven from "Alternative Rock Songs," thirty-four from "Hot Rock Songs," six from "The Hot 100," and two from the *Rolling Stone*

Predominantly Commercially Oriented Sources		Predominantly Transgressive Sources	
<i>Billboard</i> – “The Hot 100”	6	Tori Amos – full-length studio rock albums	43
<i>Rolling Stone</i> – “500 Best Songs of All Time”	2	Radiohead – all full-length studio albums	22
<i>Billboard</i> – “Alternative Songs”	77	Tool – all full-length studio albums	28
<i>Billboard</i> – “Hot Rock Songs”	34	<i>Wikipedia</i> – “List of musical works in unusual time signatures”	56
Total Number (number of duplicates)	103 (16)	Total Number (number of duplicates)	143 (6)

Table 2.1: Number of songs contributed by each source to the corpus.

list (fourteen entries appear on two of these lists, one of them on three).⁶³ The three core artists offer ninety-two songs: forty-three by Amos, twenty-two by Radiohead, and twenty-eight by Tool. An additional fifty-six entries from the *Wikipedia* list (six overlapping with the core artists’ contributions) bring the total number of songs from predominantly transgressive sources to 143. Finally, six songs overlap between the commercial and transgressive sources; all but one are singles by core artists with good chart success (hence, the totals for each column add to 246, rather than 240).

Categorizing the Corpus and Large-Scale Trends

Having established the makeup of the corpus itself, what can we say about these songs—how might we best get acquainted with them? Two considerations are especially relevant to understanding the metric trends within a large group of songs. The first mode of inquiry is metric hierarchy, encountered already in my discussion of sources. The second is new—a categorization of irregular metric patterns according to their functional type. My summary of each approach is supplemented by a figure, showing historical trends within the corpus. Just as important, however, is my continuing discussion of exceptional and ambiguous cases in the following chapters. This is especially true in my review of the functional classification, wherein numerous exceptions speak to the difficulty of developing distinct categories. I conclude this chapter by discussing the cross-relation between hierarchical level and functional type, summarizing the broad strokes of the corpus, and suggesting promising questions to be taken up in subsequent chapters. Throughout this entire

⁶³ The contribution of the *Rolling Stone* list is so modest (recall that it contained a small number of songs from recent decades) that the two songs that qualify for the corpus are both already accounted for by other sources. Because of this, and because two songs are hardly a robust sample, I omit the *Rolling Stone* data in what follows.

overview, I differentiate songs by each of the core artists, songs from the *Wikipedia* list, and those from the *Billboard* lists via colour coding.

HIERARCHICAL LEVELS OF IRREGULARITY

Given the limitation of the corpus to songs with irregularity at the half note level or lower, these songs by definition exhibit less variety (in terms of hierarchy) than in the songs of the sources. However, as noted in my overview of Tool’s catalogue, when considering a more intensely irregular collection of songs, it can be useful to differentiate between beat-level irregularities and sub-beat irregularities.⁶⁴ Three categories are thus relevant to the present discussion: sub-metric, metric, and super-metric (half-note) irregularities.⁶⁵ **Figure 2.11** divides the corpus into five half-decade periods and shows the distribution of the three hierarchical levels across this chronology and among the various sources.⁶⁶ The bracketed numbers beside the names of core artists indicate the number of albums they released within each five-year span. Metric irregularities (i.e., those at the beat level) are arranged such that they are bisected by—or are centered on—the vertical axis. The placement of bars representing sub-metric and super-metric irregularities (to the left and right, respectively) clarifies which sources contain songs belonging predominantly to one category or another. A numerical average at the top of the chart makes clear the relative portion of the corpus taken up by each source and allows easy comparison of the aggregate of songs from each.

Considering the average figures in this topmost set of bars, we can see, for instance, that Tori Amos and Radiohead both employ irregularities at all three hierarchical levels with nearly even distribution. Both artists favour super-metric irregularities by a modest amount, and Amos is proportionally somewhat more interested in the sub-metric level than Radiohead. In keeping with observations made earlier, Tool’s contributions are concentrated at the sub-metric level and both Tool and the *Wikipedia* list largely eschew super-metric irregularities—the former by compositional inclination; the latter through selection criteria. Finally, the *Billboard* sources show a steady increase

⁶⁴ Irregularities that concern the sixteenth-note level are rare even within the corpus (I have identified only five such examples) and are not distinguished from other sub-beat cases at this time.

⁶⁵ From this point forward, I often use the term “super-metric” in place of locutions like “half-note” or “half-bar level.” This more abstract term better reflects the variety of note values that might best represent the level in question in transcriptions. The term also retains a sense of connection to hypermetric concerns, which—although they are not highlighted in the corpus—often inform issues at the super-metric level. See Chapter 1 for a more detailed discussion of metric hierarchy.

⁶⁶ Many songs in the corpus are at least mildly ambiguous with respect to tactus level, multiple subdivisional possibilities, or the role of contextual cues in parsing a section’s meter. Careful negotiation of such ambiguities is a recurring theme in subsequent chapters, which include discussion of many of the songs in question.

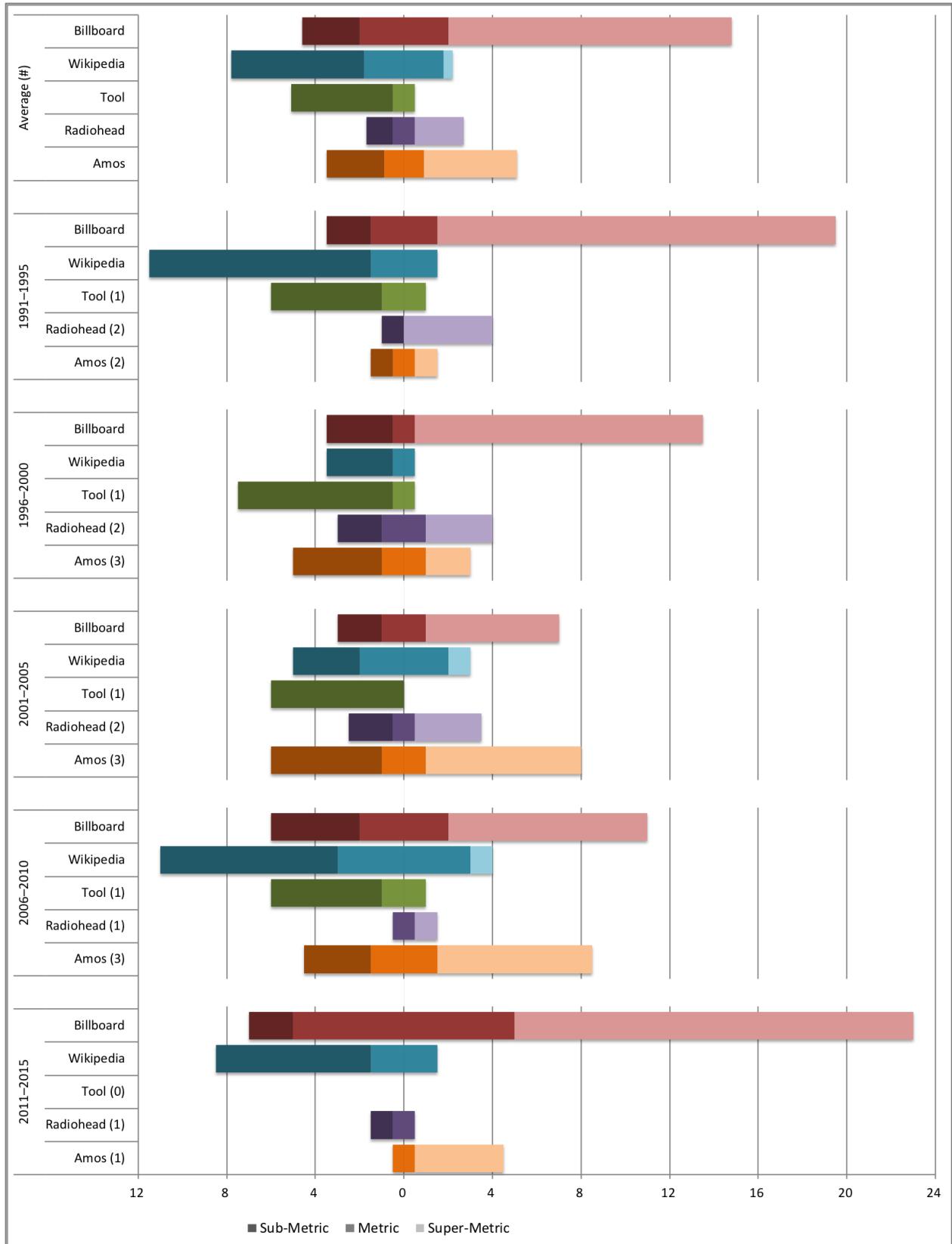


Figure 2.11: Distribution of songs by hierarchical level of irregularity.

from number of sub-metric entries, to metric (nearly twice as many), to super-metric (almost two thirds of the total). Conveniently, considering the desirability of a diverse corpus, the wealth of super-metric entries in the *Billboard* lists is nearly balanced by the sub-metric proclivities of Tool and the *Wikipedia* list. In the aggregate, ninety-eight songs fall in the super-metric category, fifty-seven are metric, and eighty-five are sub-metric.

The chronological layout of the chart allows us to observe the rough trajectory of each source's evolution. As before, I caution against reading too much into these trends; however, the grouping together of five-year spans mitigates the effect exerted by any individual album. The exception comes when only a single album occupies a given data entry. This is the case for the final entry for Amos (only *Unrepentant Geraldines*, 2014), the final two for Radiohead (*In Rainbows*, 2007, and *The King of Limbs*, 2011), and all four for Tool. In light of this scarcity of albums by Tool, it is especially remarkable that the band's irregularities are more consistent than those of any other source from one span of years to the next. As noted earlier, songs with only super-metric irregularities are entirely absent from Tool's output; metric-level irregularities are always in the minority with no more than two on any given album.

In the work of both Amos and Radiohead, unlike in that of Tool, we do observe changes over the course of time. Furthermore, the trends in the music of the two artists appear to run exactly opposite one another; though, with Radiohead, it seems likely that our sample is too small to say anything definitively. In Amos's work, irregularities are becoming more frequent if understood broadly; this is due, in part, to the simple fact that Amos has been at her most prolific in the corpus's later years. More significant is Amos's apparently waning interest in sub-metric irregularities; the absence of any such instances in her last release counted in the corpus (2014) stands out especially. As for Radiohead, while two recent albums (2007 and 2011) have fewer irregularities in general, the decrease appears to be attributable entirely to the super-metric level; as noted earlier, irregularity at the metric and super-metric levels is modestly increasing in the band's output. Odd-cardinality patterning at the super-metric level is something of a hallmark of Radiohead's early, grunge phase (in songs like "Vegetable," 1993; "Bones," 1995; and "Lucky," 1997); the absence of such patterning from *The King of Limbs* (2011) is thus all the more perceptible. However, we ought not to place too much weight on patterns made up of an album or two. Both trends just suggested are reversed in Radiohead's 2016 release, *A Moon Shaped Pool* (not depicted in **Fig. 2.11**), which features four metrically irregular songs, three of which would belong in the super-

metric category (the fourth is irregular at the beat level). It is therefore safer to say that Radiohead's use of metric irregularity is more-or-less consistent, from 1993 to the present (like that of Tool), but that it fluctuates from album to album.

Whereas the recordings of Amos, Radiohead, and Tool suggest unidirectional trends, or else fairly static metric idiolects, the data from the *Wikipedia* and *Billboard* lists are somewhat more convoluted, exhibiting some trends that change course midway through the corpus. For example, the total output of both sources is at its most robust towards the beginning and end of the period surveyed: the *Wikipedia* list flags early, with only four representative songs from 1996–2000, while the *Billboard* dataset is more symmetrical—an inverse bell distribution (2004 and 2006 are the only years without a single representative from the popular charts). The two sources also share an increase in beat-level irregularities in the second half of the corpus. This is most pronounced in the *Billboard* charts and continues in that source through the most recent years considered (2010, 2011, and 2013 contribute three songs each). In the *Wikipedia* list, the most recent years show a sudden decline in irregularities of the metric type especially, and against the general trend of growth. I would speculate that, when dealing with a source based on the contributions of individuals (as opposed to automated data from radio airplay, etc., as in *Billboard* charts), there could be a lag of a few years between the release of a relevant song and its addition to the list. I would therefore not be surprised to see a healthier sample for 2011–15 when consulting the *Wikipedia* list in years to come.

FUNCTIONAL TYPES OF IRREGULARITY

In considering the functional roles of different metric irregularities, we enter conspicuously murkier waters than in our discussion of hierarchical level. Before explaining my approach in categorizing irregularities according to type, a caveat is in order: the bulk of the chapters that follow explore the themes presented in these next few paragraphs and the complexity of the metric approaches collected within the corpus cannot be fully grasped by merely consulting the chart below. The partitioning of songs in this discussion into six categories suggests this complexity, as does the substantial overlap—both conceptual and in practice—between several of these categories. With this in mind, the present section introduces my functional typology of metric irregularity and offers an overview of the broad patterns observed in the corpus.

My classification of songs by the function of their irregularities yields six categories: four discrete types of irregularity and two combinations thereof. The first two types concern consistent irregular

patterning throughout an entire work or a full formal section—irregular grooves—which are the focus of Part II of this dissertation.

Type 1: Cardinal Irregularity The entire song follows a consistent irregular pattern.

An example of type-1 irregularity is Radiohead’s “15 Step,” which is most easily notated in 5/4-time from start to finish. Songs that involve an odd-cardinality super-metric pattern are also considered cardinal irregularities. An example is OutKast’s “Hey Ya!,” with its repeating metric pattern of eleven half notes.

Type 2: Sectional Irregularity Different sections of the song are in different meters.

Type 2 includes songs that alternate between regular meters, like Tori Amos’s “Wednesday,” the verse and chorus of which are in 4/4, the bridge in 6/8; it also counts songs that have one or more sections in a cardinally irregular meter, like “The Becoming” by Nine Inch Nails, which consists predominantly of an alternation of 7/8 and 6/8 (a stable pattern with cardinality 13) but has a bridge and outro in 6/8 time.

A third type of irregularity concerns passages of a more transient nature, rather than the structural, form-defining irregular patterning characteristic of types 1 and 2. Complexities involving this sort of irregularity, including the other irregular types enumerated below, are treated more thoroughly in Part III of the dissertation.

Type 3: Isolated Irregularity The song, or a section thereof, is predominantly in one meter but contains at least one (isolated) measure better understood in a different meter.

By far the most common type-3 situation is the occurrence of one or several measures of 2/4 within an otherwise 4/4 context. In Alanis Morissette’s “Ironic,” for instance, a two-beat extension separates the third verse from an expanded prechorus; the rest of the song is in 4/4. Often, a 2/4 measure is found within a formal section and is repeated frequently over the course of a song; one example is the chorus of “The Beekeeper” by Tori Amos (discussed further in Chapter 6; see **Ex. 6.4**). Type 3 also covers more intensely irregular examples, among which Soundgarden’s “Pretty Noose” stands out. As in the previous examples, the song is almost entirely in 4/4 time but, on four occasions, the final measure of a section is shortened by the length of a triplet—twice at the end of verses, once closing the guitar solo, and once at the end of the song. The resulting metric irregularity can be notated in many ways. Due to the contextual similarity of the first half of the measure(s) in

Example 2.5: Irregular fill in Soundgarden's "Pretty Noose" (1996).

question to the preceding material, I transcribe it as a pair of shorter measures—one of 2/4 and one of 5/8 (quarter note = dotted quarter; see **Ex. 2.5**).⁶⁷

Because types 1 and 2 concern the metric structure of a song or section, while type 3 describes exceptions within such a structure, isolated irregularities can also be found within songs that involve cardinal or sectional irregularity. This allows for two combinations of types, which include songs of greater metric complexity.

Types 1+3: Isolated Irregularity within Cardinal Irregularity The song follows a consistent irregular pattern with the exception of at least one (isolated) measure better understood in a different meter.

An example of types 1+3 is Vanessa Hudgens's "Last Night," which is in a quick 5/4 save for a few measures of 6/4 (or 3/4 [x2]) that punctuate phrases in the choruses and bridge.

Types 2+3: Isolated Irregularity within Sectional Irregularity Different sections of the song are in different meters and at least one of these sections contains at least one (isolated) measure better understood in a different meter.

While songs like "Last Night" that combine types 1 and 3 are quite rare, those with both sectional and isolated irregularities (types 2+3) form one of the most populous categories within the corpus—second only to songs strictly in type 3; this is due to the large number of 4/4 songs with isolated 2/4 measures. A recent example of types 2+3 is Hozier's "Take me to Church": its verses are mainly in

⁶⁷ The awkwardness of the metric modulations in my transcription captures a listening experience built on shifting entrainment periodicities. The fact that the song was evidently not recorded to a click track exacerbates this listening experience.

Formal Section	verse 1		verse 2		pre-chorus		chorus	
Hypermeasure	irregular	12 (4)	irregular	12 8	once	13	regular	2
Measure	irregular	6 (4)	irregular	6 (8)	irregular	6, 7	regular	2
Quarter Note	irregular	3 (4)	irregular	3 (4)	irregular	3 (4)	regular	4 = (2,2)
Eighth Note	regular				2			
verse 3	verse 4		chorus	bridge		pre-ch.	chorus	
irregular 12, 4 as before regular	irregular 12, 8 as before		as before	irregular 16, 14, 8 irregular 8 (6) irregular 4 (2)	as before	as before		
			2					

Table 2.2: Metric hierarchy and regularity by formal section in Hozier’s “Take me to Church” (2013).

3/4 but close with one or two measures of 4/4, while its choruses are fully in 4/4 and its bridge is in 4/4 with a single measure of 2/4 (**Table 2.2** provides a form diagram).

Many of most complex examples in the corpus are found at the intersection of sectional and isolated types of irregularities. Tori Amos’s “Spark” (discussed in Chapter 1) exemplifies the variegated metric assemblages that often result from this intersection. At its most extreme, the concatenation of diverse isolated irregularities over changing base meters can sometimes result in passages in which the metric structure abandons any sort of consistent patterning. My fourth type of irregular function is reserved for just such passages.

Type 4: Inconsistent Irregularity At least one section of the song cannot be said to follow any stable pattern—not even through the analysis of isolated irregularities within an already irregular meter.

Because inconsistent irregularities are, as a type, an outgrowth of another defined category of irregularity, the boundary between type 4 and types 2+3 is somewhat fuzzy. I devote some attention to formalizing this fuzzy boundary in Chapter 6; for now, an example will suffice to illustrate the concept of inconsistent irregularity. The breakdown, bridge, and instrumental sections of Tool’s “Schism” demonstrate a range of more and less consistent metric fabrics (see **Table 2.3**). Observe the complex and often changing cardinalities found throughout the section, from a repeating 27 to single instances of 36 and 32 in the breakdown, to 28(x2) in the bridge, to an instrumental of 22, 9, 14(x3), and 11 (see the measure level). While elements of consistency are found throughout the three-and-a-half minutes of music, they become scarcer towards the chaotic instrumental, to the extent that phrases like “mostly in X meter” fail to provide useful description. The impossibility of

Formal Section	breakdown (some w/ lyrics)			bridge 2		instrumental		
Hypermeasure	regular	27	irregular	36, 32	regular	28	once	31
Measure	irregular	12, 15	irregular	16 (4)	irregular	12, 16	irreg.	22, 9
Quarter Note	irregular	6 (9)	irregular		6 (4)		irreg.	9 (4)
Eighth Note	irregular				3 (2)			8 (6, 3)

Table 2.3: Metric hierarchy and regularity in the breakdown, second bridge, and instrumental of Tool’s “Schism” (2001, 3:31).

concise verbal explication—though an admittedly subjective quality—is perhaps the feature that best defines passages of inconsistent irregularity.

The six categories I have just described allow us to map the broad functional trends of the corpus (see **Fig. 2.12**). While I retain the chronological layout and the system of colour-coding artists and source lists, several small distinctions between this chart and the previous bear mention. First, the greater number of categories necessitates a more involved system of annotation: in addition to different shades of light and dark, I introduce striped blocks to denote combinations of functional types. More importantly, the relationships between types are more difficult to linearize than the clear conceptual organization of hierarchical levels. It is intuitive enough, for example, to place the most general irregularities (type 1) at one end and the most local (type 3) at the other but, between these extremes, no ordering is entirely satisfactory. I have opted to prioritize the more general in two-type combinations (e.g., types 1+3 is found beside type 1, not type 3). The placement of type 4 next to types 2+3 acknowledges the close relationship between those two categories. Finally, the orientation of types to the left or right of zero is essentially arbitrary but, importantly, avoids placing either type 1 or type 3 at the base of a stacked array, implying the primacy of that type. Instead, the two types are arranged as limits on a spectrum, the centre of which is denser and more convoluted.

As before, it is useful to examine the averages at the top of the chart before proceeding to consideration of chronological trends. In comparing the average trends, different groupings of types suggest themselves for each artist or list, and vice versa. For instance, Tori Amos can be seen as most like Tool if considering inconsistent irregularity, or most like the *Billboard* list if considering isolated irregularity—a category in which the two sources far outstrip their companions. Radiohead is, on balance, very similar to the *Wikipedia* list; for example, these are the only two sources in which cardinal irregularity is somewhat common. A subtler contrast between songs by Radiohead and *Wikipedia* artists, on the one hand, and those of Tool and Amos, on the other, is the greater

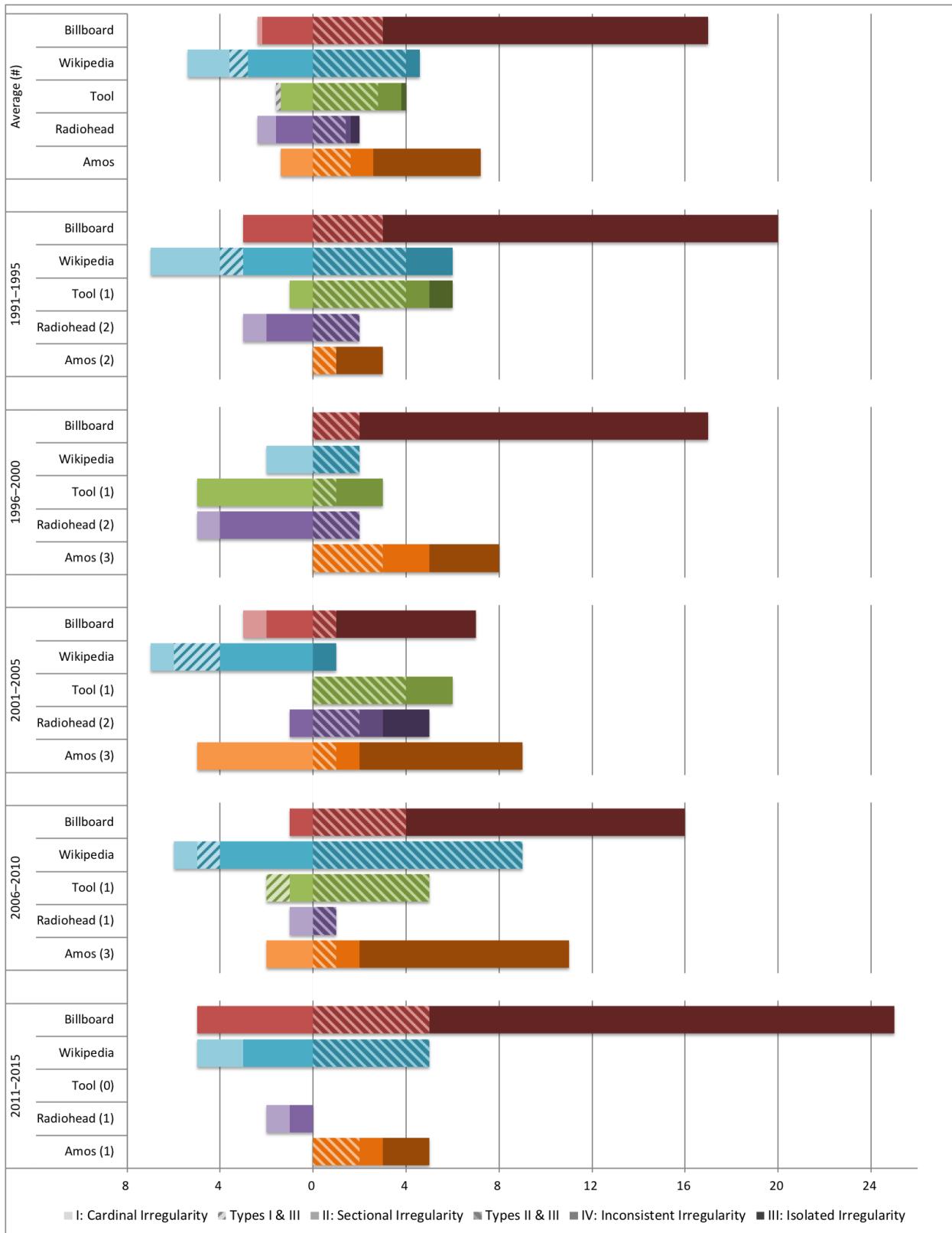


Figure 2.12: Distribution of songs by functional type of irregularity.

proportional representation of pure sectional irregularity in the former pairing. In the work of latter, one is more likely to find sectional irregularity in conjunction with isolated irregularity (types 2+3).

Turning to the chronological portion of the chart, it becomes apparent that the more substantial subdivision of the corpus required by the several types limits what we can confidently say about this data. It is especially difficult to say very much meaningful about the more diverse source lists aside from the trends in overall numbers of songs per five-year span already noted. The most reliable observations can be made about the output of the core artists since these sources are more internally consistent than the *Wikipedia* and *Billboard* amalgamations. For example, isolated irregularity contributes significantly to Amos's output throughout her career, whereas sectional irregularity is prevalent only in the early 2000s. As I have noted before, Tool have remained remarkably consistent in their use of irregular meter, exemplified here in their affinity for combining sectional and isolated types, and often resulting in song sections of the inconsistent irregular type. The chronology of Radiohead's metric irregularities is more fluid: cardinal and sectional irregularities are quite rare in the new millennium, whereas types 2+3 are somewhat more stable across albums.

RELATING HIERARCHY AND FUNCTION

The final section of this chapter ties together the two preceding approaches to navigating the data from the corpus and, in so doing, summarizes in the broadest sense the knowledge gained from this study. **Figure 2.13** embraces this summary view; in this chart, for the first time in this chapter, I abandon the chronological division of data in order to highlight intersections of hierarchical level and functional type of irregularity through the entire corpus. Each pie chart shows the distribution among artists and source lists of songs with a given level and type of irregularity; the relative size of each chart corresponds to the number of songs with certain characteristics. For example, since Radiohead has two songs with sub-metric type-1 irregularity and two songs with super-metric type-3 irregularity, the areas coloured purple in the top left and bottom right charts are roughly equivalent.

The layout of information in this chart promotes many new observations about the songs of the corpus. Two of the most obvious points concern the distribution of function among songs with super-metric irregularities. First, there are no entries at all for types 1+3 or 4 in the super-metric column. Among super-metric songs, this absence is compensated for by the wealth of super-metric type-3 songs; this category is dominated by *Billboard* lists but also contains a substantial number of contributions by Amos. More generally, while type 3 leans towards the super-metric side in general

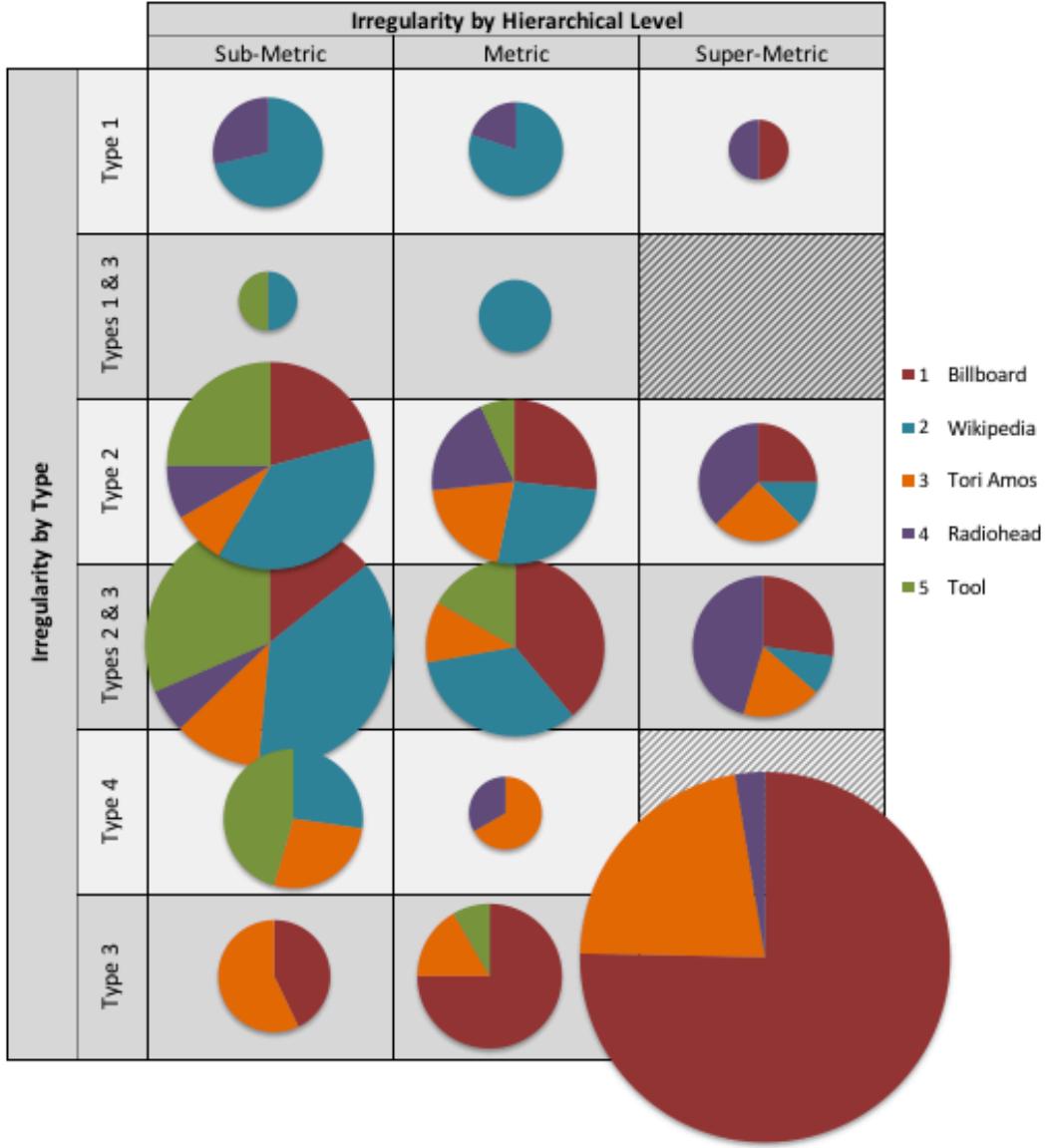


Figure 2.13: Trends among the songs of the corpus, arranged by hierarchical level and functional type of irregularity and coloured according to artist/source.

(thanks largely to the *Billboard* entries), all other categories are better-populated on the sub-metric side (except for types 1+3, with very little data overall). Regarding the vertical dimension, the ordering of types (retained from Fig. 2.12) seems justified when one considers the distribution of songs from each source across Figure 2.13. The two rows at the centre (i.e., type 2 with and without type 3) are generally well populated and all five sources contribute. The metric (beat-level) type-2 is among the most evenly distributed pie charts in the figure and reflects the proportional makeup of the corpus relatively accurately. It therefore seems fitting that this type should occupy a central position along the vertical axis. The sub-metric data for types 2 and 2+3 are also populated by all

five sources but they show a greater degree of distributional independence: *Billboard* entries become disproportionately scarcer and those of Tool and *Wikipedia* more numerous at the sub-metric level.

If we consider the intersection of metric and types-2/2+3 irregularities to constitute a sort of middle ground for songs of the corpus, the output of each source can be assessed based on its overall relationship to this central group. The *Wikipedia* list, for instance, skews towards the top-left corner of the figure (sub-metric type-1), while Radiohead favours the top-right (super-metric type-1). The other three sources skew downwards towards type-3 irregularities; Tool favours the sub-metric side, *Billboard* the super-metric, and Amos falls somewhere in the middle. The absence of *Billboard* entries from the type-4 row might seem anomalous—especially given the wealth of entries in the rows immediately above and below—but it is important to recall that type 4 contains only the most inconsistently irregular examples.

Many of the most telling features of the chart are found in the absence or rarity of a given source from or within a row, column, or group. Tool’s absence from the super-metric column is one of the most obvious examples. Equally plain is Amos’s apparent disinterest in composing songs with type-1 irregularities. Further study of the top two rows reveals that the *Wikipedia* source is dominant among type-1 contributions, except at the super-metric level, where only two songs are found—Radiohead’s “Bones” and OutKast’s “Hey Ya!” Tool’s lone type-1 contribution, “Right in Two,” also stands out and is, in fact, a debatable case—the band’s use of different subdivisions of an 11-cardinality meter for verses and choruses verges on sectional irregularity (type 2), rather than cardinal (type 1). Another interesting absence is that of Radiohead from metric types 2+3, particularly given their occupancy of many adjacent intersections along both axes. However, with only a single type-4 entry at the metric level and only two sub-metric type 2+3 songs, the noted absence can be seen as part of a larger pattern in Radiohead’s music: namely, a lack of interest in combining sectional and isolated irregularities at low hierarchical levels.

Intersections that are generally under-populated imply an uncommon practice within the corpus and may merit closer attention. I have already noted the clearest examples, super-metric type 1 and sub-metric type 1+3, which are unsurprising. Additional notables include the three songs belonging to metric type 1+3; two of these are by the same artist (“Wind” and “Kamisama no Shitauchi” by Akeboshi, both 2005), who does not appear elsewhere in the corpus. Metric type-4 likewise contains only three songs, two by Amos, who also contributes substantially to the sub-metric type-4 group.

The third is Radiohead's "Sail to the Moon (Brush the Cobwebs out of the Sky)"—one of the group's most metrically adventurous songs (which I analyze in Chapter 6).

The remarks I have made on **Figure 2.13** detail the most significant patterns within the corpus and highlight a few exceptional songs. Further study of the chart can of course bring greater familiarity with the corpus, but this synoptic perspective means little without concrete examples through which to understand the significance of these patterns and outliers. Therefore, in the following chapters I analyze specific examples, exploring the more complex questions that arise from the corpus.

Part II

Regular Irregularities: Repeating (Cardinal and Sectional) Patterns

As illustrated in the previous chapter, metric irregularities are found in various contexts (cardinal, sectional, or isolated); these contexts frequently commingle, and the resulting irregular types can be further differentiated according to the hierarchical level at which irregularity occurs (sub-metric, metric, or super-metric). In Part II, I focus on stable irregular patterns—cardinal and sectional irregularities. These include passages without isolated irregularities that are encountered in mixed-type songs. Some patterns are relatively common, and these can serve as stable metric frameworks for more adventurous irregular play, typically through the introduction of isolated irregularity (see Part III). Other metric cardinalities lend themselves to a wealth of possible patterning, in which case it can be difficult or even misguided to assert a normative interpretation. With a better understanding of the most common irregular patterns, we can analyze more metrically complex passages and appreciate the idiosyncratic approaches of different artists.

My analyses in the following three chapters rest on two related conceptual pillars: drumbeat practice and patterns of metric regularity, to which irregularities are inescapably related.¹ As I argued in Chapter 1, the drumbeat of a passage can often clarify an ambiguous metric structure. While the drum kit is by no means the final arbiter of meter in rock, familiarity with the drumbeat is crucial when analyzing an irregular groove. I emphasize the snare drum as a marker of metric continuation, following the paradigmatic role of this drum in the standard rock beat. The resulting drumbeat analysis typically accords with other metric cues in the music, but I do not hesitate to consider other instrumental parts when they come into clear metric conflict with the drum kit, or in the absence of a metrically determinant drum part (e.g., during a drum solo).

¹ The *locus classicus* where these concepts meet in rock music is the standard rock beat, introduced in Chapter 1.

Regarding metric regularity, two common patterns other than the standard backbeat merit discussion: the tresillo (mentioned already in passing) and triple meter. While neither of these patterns is nearly as ubiquitous as the standard rock beat, both are common enough within metrically regular rock that their influence can be perceived when analyzing irregular patterns (especially in drumbeats). Chapter 3 therefore begins with an overview of both the tresillo and of triple meter, using examples from the corpus to demonstrate typical practice or suggest idiomatic uses. I consider irregular patterns at the super-metric level in the same chapter, as the most predominant drumbeat strategy involves the retention of a backbeat alternation of kick and snare.

Chapters 4 and 5 treat repeating irregular patterns at lower hierarchical levels; some patterns are maintained through an entire song or song section. Chapter 4 is devoted entirely to quintuple and septuple meters—by far the most common irregular patterns; understanding drumbeat practice in these contexts informs our expectations of larger cardinalities. In quintuple meters we find an abundance of drumbeats and corresponding subdivisional structures. Septuple meters are more consistent and can often be understood in dialogue with regular quadruple-meter practice. In Chapter 5 I turn to larger odd cardinality meters, beginning with nine-, eleven-, and thirteen-beat patterns, and moving on to even more complex structures. In considering the largest irregular patterns, I theorize two categories of additive structures: *punctuated* and *split*. The former describes cases in which a repeating cycle contains several like units (e.g., measures, half-measures), punctuated by a single unlike unit. The latter constitutes patterns that are most easily conceived as two (or more) near-balanced parts (e.g., a 20-eighth-note cycle formed through an alternation of 4/4 and 12/8 measures).

Although these three chapters treat many different metric structures, some trends are generalizable. First, most irregular meters can be subdivided in several different ways, giving rise to structural differences among grooves notated in the same time signature. Many of the meters in question are larger than 4/4 measures and can thus accommodate more combinatorial possibilities. More relevant, however, are (1) the small sample size of grooves available in any given meter, which precludes the intuitive familiarity most rock listeners have with the backbeat, and (2) the impossibility of “pure” subdivisional structures and the necessity of heterogeneous grouping within at least one hierarchical level.² No meter follows any given pattern as consistently as 4/4 does the

² The term “pure” comes from Cohn (1992a and 1992b), where it describes structures that replicate the same subdivisional organization at every level (i.e., “pure duple” or “pure triple”).

standard backbeat. Nevertheless, in many irregular meters, songwriters seem to gravitate to one identifiable structure more often than others. I identify the most common drumbeat patterns and relate these to a normative structure for a meter whenever the data support such an interpretation.

What is more, most of the preferred structures across all manner of irregular meters exhibit a preference for “Platonic-trochaic” successions at the lowest irregular level. As defined by Murphy (2016, [1.3, 1.7]), a Platonic-trochaic succession is “a temporally ordered succession of contiguous durations” that “either begins with a series of one or more 3s and ends with a series of one or more 2s, or vice versa” and in which the duration of the initial series (the “run”) exceeds that of the second series (the “comma”).³ This class of successions can be best understood through comparison with other types of successions, as facilitated by **Figure 3.1**—a reproduction of Murphy’s (2016, [1.3]) Figure 1. The figure plots nearly every unique succession of 2s and 3s (omitting those with internal repetition) to a maximum of six durations according to four intersecting categories. The labels “Maximally even” and “Minimally even” concern the distribution of like durations: in the former they fall as far from one another as possible; in the latter, they are clustered together. “Platonic” refines the minimally even group by excluding those successions that begin and end with the same duration. “Platonic-trochaic” and “Platonic-iambic” further subdivide the Platonic successions according to whether the run is longer than the comma (trochaic) or shorter (iambic).

In treating some of the more complex irregular patterns in the corpus, I loosen Murphy’s definition of Platonic-trochaic successions to accommodate integers other than 2s and 3s. For instance, I count the fourteen-pulse succession (5,5,4) as Platonic-trochaic (e.g., in **Table 5.4**), where it would necessarily be mixed for Murphy (since the 2+3 subdivisions of each 5 prevent a minimally even ordering of 2s and 3s). A clear majority of the irregular patterns reviewed demonstrate the same preference for Platonic-trochaic organization identified by Murphy. This preference is strongest in septuple, undecuple (11-pulse), and tredecuple (13-pulse) patterns, especially at the submetric level, where all three meters are typically structured in dialogue with the standard rock beat (in simple time for 7/8, in compound time for 11/8 and 13/8).

³ Murphy’s work builds substantially on an earlier article by Cohn (2016). Cohn focuses on commas of two-pulse units, which reconcile runs of three-pulse units with an underlying duple framework (the simplest expression of this model is the tresillo; see below). Cohn (2016, [2.11]) also offers details about the “Platonic” properties of this type of structure, stressing the interplay of centripetal and centrifugal forces. Murphy generalizes the logic of such successions, denoting the span before the comma as the “run” and broadening the class of successions considered by admitting cases in which the two- and three-pulse aspects of comma and run are inverted.

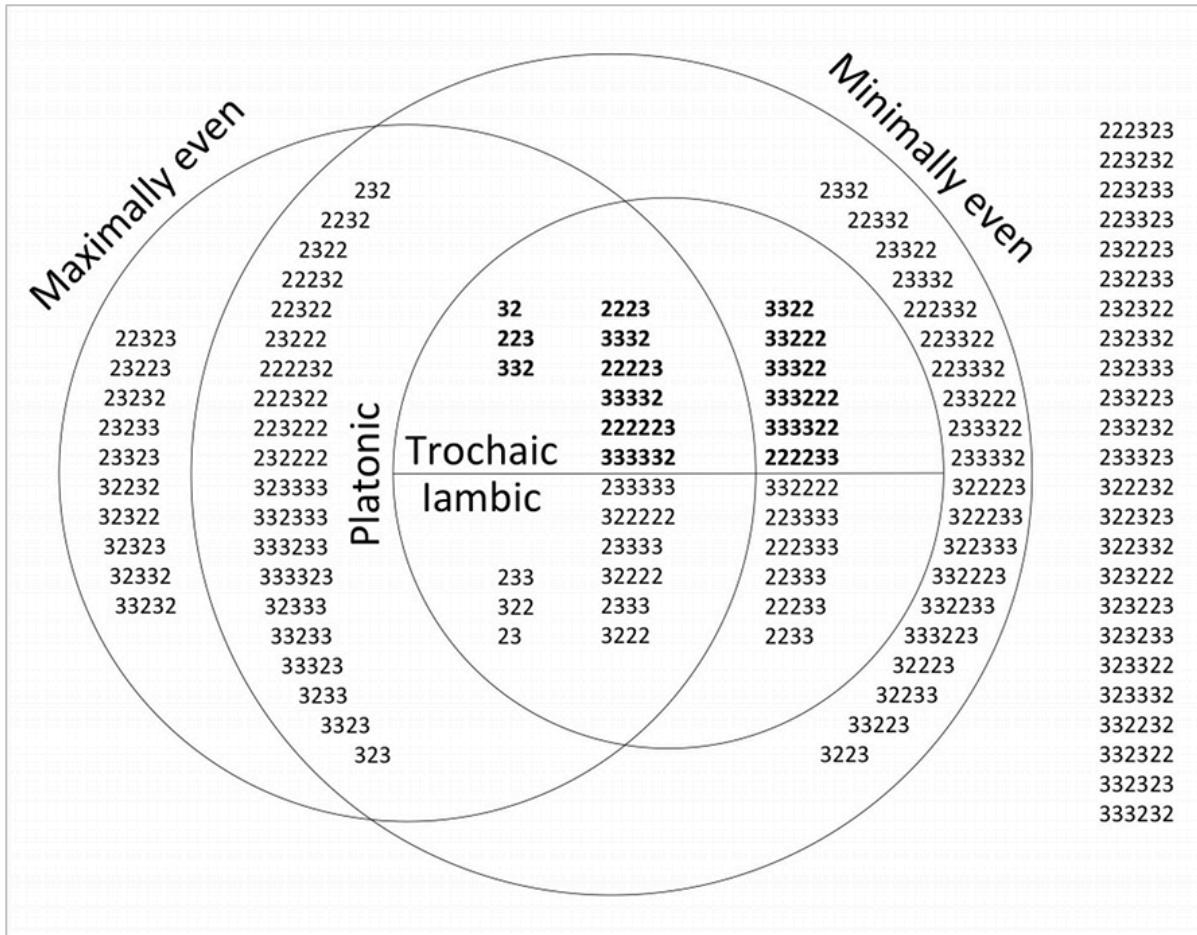


Figure II.1: Reproduction of Murphy 2016, Figure 1; Platonic-trochaic successions in boldface, as in original.

The relevance of 4/4 time as a rock-music norm is also apparent in judgments of measure length. For instance, among quintuple patterns, examples of 5/4 are more common than 5/8, but among tredecuple meters 13/8 passages far outnumber 13/4. (Examples of seven, nine, and eleven are more evenly split between metric and sub-metric patterning.) In other words, metric practice seems to favour patterns whose durations approximate most closely that of a 4/4 (or 12/8) measure. A related issue concerns cases with ambiguous tactus. The preferred range for entrainment of 500–700 ms (86–120 bpm) is an important benchmark to bear in mind; however, as I argued in Chapter 1, a listener’s stylistic competence may encourage interpretations outside of this range despite a viable candidate within it.⁴ Thus, without an understanding of drumbeat conventions, it can be difficult to assert with confidence the appropriate metric interpretation of some irregular passages.

⁴ This is the range on which London (2012, Chapter 2) settles; in addition to Chapter 1 of this dissertation, see the discussion that accompanies **Table 4.6**.

Examples of ambiguous tactus are woven throughout Chapters 3–5. Because the articulation of an irregular pattern can be an important factor in analyzing an ambiguous case, two common approaches in drum kit practice come to the fore. The strongest articulations occur when the characteristic pulses of a pattern are *undifferentiated* (i.e., given by the same drum, cymbal, or combination thereof), or when the snare articulates continuational beats (usually in alternation with the kick drum, as in the backbeat pattern). Undifferentiated patterns eschew ambiguity of pattern but can do little to inform judgments of tactus level. Metric continuations marked by the snare drum are the most reliable cues for navigating ambiguities of tactus, especially when contextualized by our knowledge of the standard practice for a given meter.

— 3 —

Preliminary Considerations and Mild Irregularities

Rock musicians often find ways of incorporating mildly irregular metric ideas into deceptively simple musical contexts. Because of the ubiquity of the standard rock beat, metric phenomena that are relatively common in other genres can become marked simply for diverging from the popular backbeat model. By outlining my understanding of quasi-metric tresillo-family successions and quasi-normative triple patterns, I foreground several important theoretical considerations and introduce the most significant drumbeat strategies outside of the standard backbeat. Most of the grooves based on the tresillo also evince Platonic-trochaic succession, confirming the relevance of this concept to rock music in a familiar metric context. In my discussion of triple patterning, I devote several examples to techniques of metric modulation—a strategy for subverting our metric expectations, though not one that typically receives the label “irregular.” The third section of this chapter considers irregular patterning at the super-metric level. My examples demonstrate an affinity for the standard backbeat, as well as several unique alternatives (some employing tresillo successions and triple cross-rhythms). I conclude with some brief remarks on the formal deployment of irregular super-meter.

The Tresillo Family: Between Meter and Rhythm

Several passing acknowledgements of the tresillo (3,3,2) in Part I of this dissertation attest to its relevance in rock music, and to the importance of addressing such patterns—even when they are not central to the analysis at hand. The prevalence of the tresillo in numerous musical styles, coupled with its singular position at the border of definitions of meter and rhythm, has led to several recent theorizations.¹ The tresillo can be derived in many different ways: from a regular quadruple rhythm

¹ Most comprehensive among these is Cohn (2016), which relates the tresillo to geometric spatial patterns that analogize diatonic and pentatonic pitch spaces. Many commentators discuss the tresillo within a given genre: Biamonte (2014) in rock, Murphy (2016) in music for film and television, and Butler (2006, 82–85) within electronic dance music, though he uses the term “asymmetrical rhythms.” Some extended tresillo relatives appear in Osborn’s (2017, 59–63) discussion of “Euclidean rhythms,” alongside other successions that we will encounter later in this chapter (all of these overlap substantially with Platonic-trochaic successions). For thorough examination of the tresillo and related rhythmic patterns in the context of their heritage in diverse African music cultures, see Rahn (1996) and Toussaint (2013).

with an anticipated third beat, from a triple division abbreviated to fit an eight-pulse frame, or from a quintuple division of the bar in alternating 2- and 1-pulse units.² These different possibilities cloud easy analysis of many tresillo patterns, some of which are very near approximations of subtler syncopations of regular quadruple meter.

A related point of contention concerns whether tresillo-family successions are best understood as rhythmic syncopations or as properly metric. In Chapter 1, I argued that the tresillo in the guitar and bass parts of “Hey Ya!” functions rhythmically because a standard backbeat in the kit encourages a regular quadruple parsing of the song’s meter. However, tresillo patterns vie for metric status in many genres (see, e.g., Chor 2010b, 37–39, and Cohn 2016, [0.3]). The question of genre and stylistic competence is crucial: it should not be overlooked that rock listeners might also perceive tresillo patterns as metric—whether because of other listening experiences, or simply due to the absence of an alternative metric frame (e.g., a standard backbeat in the kit). In fully irregular metric contexts, in the absence of wholesale duple consistency, the metric potential of a non-isochronous pattern is unavoidable. In such situations, explanations that rest on anticipated or delayed articulations of structural beats are insufficient to supply a regular metric backdrop. Conversely, when a metrically regular analysis is possible (especially one resting on nested duple divisions), it challenges and often overturns a more idiosyncratic parsing of rhythmic events. Nevertheless, I find it useful in the present context to admit the metric potential of tresillo patterns; what we learn about such structures will inform our explorations of metrically irregular contexts in later chapters.

The logic that underpins the tresillo can be easily extended, covering larger temporal swaths. For instance, many analysts have discussed (3,3)(3,3)(2,2) successions, which Biamonte (2014 [6.4]) has dubbed the double tresillo. Other, less common patterns include the retrograde tresillo (2,3,3) and retrograde double tresillo (2,2)(3,3)(3,3).³ In the corpus, we find nearly as many songs with repeating

² Temperley’s (1999) conception of “metrical shifts” explains the first of these hearings; the second is described by Cohn (2016) through an analogy to the comma (via Pressing, 1983); the rhythm described as my third option finds more detailed consideration in Butler (2006, 84–85). I hint at several of these possibilities in my discussion of “Hey Ya!” (Chapter 1) without offering any overt theorization.

³ The former succession occurs fairly often, as a surface rhythm, in the analyses of Traut (2005), as do the double tresillo and two rotations thereof—(2,3,3)(3,3,2), and (3,3,2)(2,3,3). The structure (3,2,3) seems to be rarer than these; within my corpus, for instance, it is never articulated as a repeating drumbeat. The retrograde double tresillo is notably absent from Traut’s survey, as it is from most of the sources I have found that treat such patterns. Toussaint (2013, 146) lists the succession as the first of “16 almost maximally even rhythms with 16 pulses and five onsets,” but it does not receive the same attention as other rotations, including the double tresillo and bossa-nova (3,3,4,3,3). Within Radiohead’s work, “Codex” is the only retrograde double tresillo succession catalogued by Osborn (2017, 63; see Table 3.1).

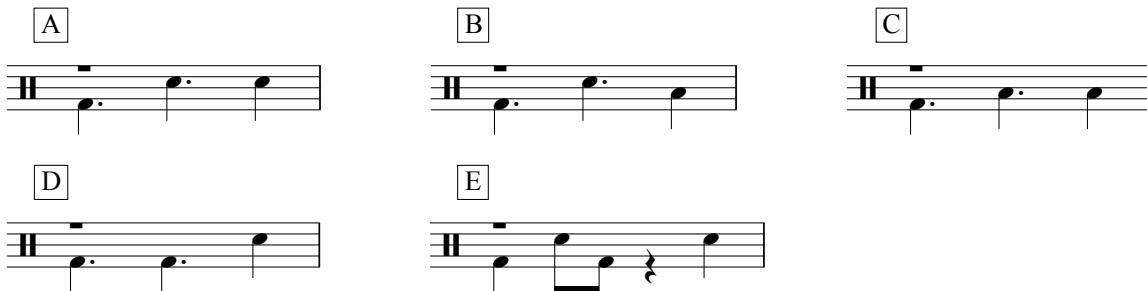
	Drumbeat	Artist—Song (year)
Undifferentiated	Snare (x3)	Blink 182—“Up All Night” (2011)
	Kick (x3)	Taylor Swift—“I Knew You Were Trouble” (2012)
	Snare (x3)	Tool—“Eulogy” (1996)
	Kick (x3)	Tool—“Jimmy” (1996)
Double-continuation	Kick – Snare – Snare	Björk—“Crystalline” (2011)
	Kick – Snare – Snare	Goo Goo Dolls—“We Are the Normal” (1993)
	Kick – Snare – Snare	Hail the Sun—“Eight-Ball, Coroner’s Pocket” (2012)
	Kick – Snare – Snare	Of Monsters and Men—“Crystals” (2015)
	Kick – Snare – Tom	Soundgarden—“Live to Rise” (2012)
Single-snare	Kick – Snare – Snare	Tool—“Forty Six & 2” (1996)
	Kick – Snare – Snare	Tool—“Parabola” (2001)
	Kick – Tom – Tom	Tori Amos—“Hotel” (1998)
	Kick – Snare – Tom	Tori Amos—“Happiness is a Warm Gun” (2001)
	Kick – Kick – Snare	Soul Asylum—“Misery” (1995)
Single-snare	Kick – Kick – Snare	Tori Amos—“Hotel” (1998)
	Kick – Kick – Snare	Tori Amos—“That Guy” (2009)

Table 3.1: List of repeating single-tresillo grooves with drumbeat support in the corpus.

tresillo-family patterns in the drumbeat as we do quintuple- or septuple-meter drumbeats—even though I did not explicitly select for tresillo-based examples. Many more songs articulate the tresillo rhythmically, without explicit drum-kit support, or contain drum fills that employ tresillo-family rhythms.⁴ The tresillo and its relatives are thus among the most common patterns in rock music. A few examples demonstrate the hallmarks of the standard rock tresillo and notable alternatives.

Fifteen songs in the corpus contain grooves based on a repeating single-tresillo articulated in the drum kit; one of these, Amos’s “Hotel,” has two such grooves. The resulting patterns can be divided into three groups based on drum articulations (see **Table 3.1**). The simplest pattern, and the one that most clearly conveys the tresillo, occurs when all three articulations are undifferentiated. Such articulations will be a recurring theme in my analyses; they are most effective at outlining non-isochronous patterns—i.e., patterns whose constituent units span unequal time, usually three or two pulses—like the tresillo. Of the sixteen single-tresillo grooves found in the corpus, undifferentiated articulations account for one quarter (four songs). An example is Taylor Swift’s “I Knew You Were Trouble” (see **Ex. 2.1**).

⁴ For an extensive list of rhythmic examples from 1980s pop, see Traut’s (2005) Table 1.



Example 3.1: Four tresillo drumbeats and a related standard-rock-beat pattern.

Example 3.2: Strong tresillo articulation in the intro of Goo Goo Dolls's "We Are the Normal" (1993).⁵

The most common tresillo articulation is the drumbeat shown in **Example 3.1A**—a kick drum on the downbeat of the measure followed by two snare drums. Because the characteristic role of the snare drum in rock drumbeats is to articulate metric continuation, its use in the present context suggests an irregular triple-meter interpretation of the tresillo.⁶ In the intro of Goo Goo Dolls's "We Are the Normal," this metric implication is supported by the guitars' strum pattern (see **Ex. 3.2**). Some listeners may be tempted to hear the kick drum as more metrically determinate in this example (i.e., (5,3)); this interpretation is unidiomatic in a rock context. As we will see in numerous examples below, the kick drum is a common site of syncopations and anacrasuses, which typically complement a more stable snare pattern. Two variants on this archetypal Kick – Snare – Snare (3,3,2) drumbeat include the use of a low tom in place of either the second snare articulation or of both snare drums (**Ex. 3.1B and C**, respectively). I understand both of these variants to retain the double-continuation

⁵ The technique labeled "rim knock" in this transcription is the same as (or closely related to) "rim click" and "cross stick." Some drummers employ the terms synonymously, while others argue the merits of more precise nomenclature.

⁶ On metric continuation and the standard rock beat, see my discussion in Chapter 1. See also Butterfield (2006), which is revisited and reconsidered by Attas (2011, 36–43).

Bass

Drums

ride dynamic varies greatly throughout

Example 3.3: Weak tresillo articulation in the first verse of Tori Amos's "That Guy" (2009).

profile of the more common (double-snare) model, with the Kick – Snare – Tom version somewhat less sharply defined.⁷

If only the first snare is absent, the structure of the beat changes more radically, due to the weakening of the first potential continuation. **Example 3.1D** shows a tresillo articulated by two kick drums followed by a snare. The similarity between this pattern and a common backbeat variant is significant (cf. **Ex. 3.1E**). In the first verse of Amos's "That Guy," for instance, it is possible to hear either the (triple) tresillo or the (quadruple) backbeat as metric (see **Ex. 3.3**) and, in fact, the latter possibility is soon realized with the addition of a snare on beat two. As we will see, the simple question of whether or not a potential continuation is articulated by the snare drum has far reaching ramifications for our ability to assert the metric structure of many irregular patterns.

I expect some listeners will find the metric status of the retrograde tresillo dubious—more so than even a weak articulation of the tresillo. The solitary example in the corpus, James Bay's "Hold Back the River," employs a strong articulation of the pattern (kick, snare, snare) throughout almost the entire song (see **Ex. 3.4**). Nevertheless, this tresillo may not be heard as metrically salient due to the strong familiarity associated with the alternation of kick and snare on beats one and two: many listeners may well interpret a backbeat variant, regardless of the organization of the second half of the measure. Indeed, the rarity of this drumbeat suggests that it is more intuitive to rationalize the second snare as an anticipation of the expected beat-four articulation, rather than a proper marker of a double continuation (as we expect in the more common, non-retrograde tresillo). Whatever our

⁷ A further distinction could be drawn between higher pitched (rack) toms and lower (floor) toms, as the former sound more like the snare drum and the latter more like the kick (though these generalities are further complicated when we consider production and recording techniques). Future research might also consider the different physical gestures involved in producing these various articulation patterns on the drum kit, in order to address performers' negotiations of metric subdivision.

$\text{♩} = 135$

bracketed notes are sometimes omitted

Example 3.4: Retrograde tresillo in James Bay’s “Hold Back the River” (2013).

metric interpretation of it, the beat of “Hold Back the River” is certainly distinctive in its fusion of tresillo and backbeat elements.

With more complex tresillo relatives, undifferentiated articulations are by far the most common strategy; other drumbeat possibilities are usually best explained through comparison to single-tresillo or standard-rock-beat patterns (see **Table 3.2**). Whereas Tool contributed only three of the sixteen grooves summarized in **Table 3.1**, the band has produced far more double, retrograde double, and other tresillo patterns than any other artist considered. In longer, more complex patterns like these, we encounter more variety in the exact articulations emphasized. With double tresillo patterns (both regular and retrograde), this variety in articulation stems from whether or not the single four-pulse unit is subdivided. Some of the drumbeats listed have six articulations, implying a subdivided four (2,2), while others have only five, implying no subdivision (4). All those songs with a beat of alternating kick and snare belong to the former category (see **Ex. 3.5A**); those that employ the compound tresillo beat belong to the latter (see **Ex. 3.5B**).

Three excerpts from Tool’s “Parabola” invite a more detailed consideration of drumbeat, rhythm, and meter within the tresillo family. The passages transcribed in **Example 3.6** demonstrate, in turn, (A) a unique drum-kit articulation of the retrograde double tresillo, (B) a close relative of the double tresillo (omitted from **Table 3.2**), and (C) a double tresillo clarified in the guitar part. Following an unambiguous standard backbeat through the song’s introduction, the groove for the verse changes immediately to a retrograde double tresillo, articulated largely by the toms (**Ex. 3.6A**). In the absence of more than a single snare articulation, it is difficult to assert an obvious grouping structure for the five articulations. It is possible to hear the grouping outlined in the table heading (i.e., (4)(3,3)(3,3)), but the high tom hit in the middle of the measure allows a hearing that emphasizes a variant of half-time feel—(4,3)(3,3,3). I have identified the groove as undifferentiated

Drumbeat		Artist—Song (year)
<i>Double Tresillo</i> (3,3)(3,3)(2,2) or (3,3)(3,3)(4)		
Undifferentiated	Kick – Snare (x4)	Incubus—“Adolescents” (2011)
	Kick (x5) – Snare	Tool—“Intolerance” (1993)
	Snare (x6)	Tool—“Hooker with a Penis” (1996)
	Guitar (x6)	Tool—“Parabola” (2001)
	Guitar (x6); drum solo	Tool—“Ticks & Leeches” (2001)
	Kick – Snare (x4)	Tori Amos—“Hotel” (1998)
Alternating (backbeat extended)	all three songs are: Kick – Snare – Kick – Snare – Kick – Snare	Goo Goo Dolls—“Iris” (1998) Sawyer Fredericks—“Iris” (2015) Tool—“Flood” (1993)
Compound (single tresillo subdivided)	both are: Kick – (Kick) – Snare – (Kick) – Snare	Tool—“4” (1993) Tool—“Third Eye” (1996)
<i>Retrograde Double Tresillo</i> (2,2)(3,3)(3,3) or (4)(3,3)(3,3)		
Undifferentiated	Kick (x2) – Hi-hat (x4; studio delay effect)	Apocalyptica feat. Adam Gontier—“I Don’t Care” (2007)
	Guitar (x6)	Dream Theater—“Scene Six: Home” (1999)
	[Kick, snare, and crash] (x5)	Tool—“Forty Six & 2” (1996)
	Kick – Snare – Toms (x3)	Tool—“Parabola” (2001)
<i>Larger and/or Complex Patterns</i>		
Quadruple-Tresillo Cross-Rhythm ((3,3)(3,3))((3,3)(3,3))(3,3,2)	Heavy Guitar (x11)	Tool—“Eulogy” (1996)
Retrograde Tresillo + Single Tresillo (2,3,3)(3,3,2)	Kick (x6) (snare off-beats)	Tool—“Forty Six & 2” (1996)
Compound Tresillo: slow (3,3,2) subdivided as (3,3,3)(3,3,3)(3,3)	[Kick – Kick – Snare] (x2) – Snare – Kick	Tool—“Lateralus” (2001)
Quadruple Tresillo grouped in threes: (3,3,3)(3,3,3)(3,3,3)(3,2)	[Kick – Kick – Snare] (x3) – Kick – Snare	Tool—“The Pot” (2006)

Table 3.2: List of repeating compound-tresillo grooves in the corpus.

The image contains two musical staves, labeled A and B, illustrating different subdivisions of a double tresillo pattern. Staff A shows a pattern where the first two eighth notes of each measure are grouped together, while the third eighth note is separate. Staff B shows a pattern where the first three eighth notes of each measure are grouped together, and the fourth eighth note is separate. Both staves are in common time (indicated by a 'C') and show a sequence of eighth notes on a single line.

Example 3.5: Two common double tresillo beats demonstrating varied subdivisional possibilities.

because of the difficulty I perceive in discerning a clear hierarchy in its mixture of snare and tom articulations.

The second tresillo-based groove in “Parabola” comes near the middle of the song, after a metric modulation that emphasizes durations of a dotted eighth note. As **Example 3.6B** shows, the kick initially retains this rhythm; however, the dotted pulse is not retained beyond these first two articulations (cf. the “Compound” tresillo category in **Table 3.2**). Furthermore, the straight quarter

The musical score consists of three staves. Staff A (Drums) shows a pattern of eighth-note pairs with various rhythmic subdivisions. Staff B (Drums) shows a more complex pattern with sixteenth-note figures and various markings like asterisks and crosses. Staff C (Electric guitar) shows a sixteenth-note pattern with dynamic markings and a note labeled '(bend & release)'. The tempo for all three is indicated as quarter note = 101, 188, and 58 respectively.

Example 3.6: Subtleties of tresillo-family permutations in three grooves from Tool’s “Parabola” (2001).

notes in the hi-hats mitigate the metric potential of the kick-drum subdivision. Given these rhythmic cues, I identify the groove as a (half-time) single tresillo, with kick-drum syncopation. Nevertheless, this groove approximates the double tresillo more than any other single tresillo in the corpus.⁸

The last tresillo groove in “Parabola,” occupying the song’s outro, is notable for its instrumentation. Initially the drums drop out entirely, allowing the guitar to establish a clear, six-pulse double tresillo. Upon its re-entry, the kit neither subverts nor fully corroborates the guitar pattern (see **Ex. 3.6C**). Examples in which the guitar articulates a tresillo-related pattern are not uncommon in double- and larger tresillo contexts. Within the corpus, such guitar parts are usually heavily distorted, increasing their dynamic impact in the mix, and they are always undifferentiated in their articulation of a pattern (i.e., no examples in the corpus exemplify a clear alternation of two chords or pitches, corresponding to a familiar drumbeat pattern). With the guitar providing a stable (potentially metric) foundation, the drummer is free to explore more virtuosic possibilities.⁹ For

⁸ A similar situation arises in the chorus of Amos’s “Black-Dove (January)” (e.g., ca. 3:00).

⁹ Indeed, if the drum part is too metrically stable, it will either reinforce the guitar part (in which case the drums will usually be understood to be the more metrically determinant instrument) or overthrow it (in which case the guitar part will often be understood as a cross rhythm. Only when the drums are largely absent or metrically agnostic—i.e., usually virtuosic/soloistic—will the guitar be understood as metrically determinant.

[audio ex. only]

Example 3.7: Virtuosic drum work over a stable guitar part in Tool's "Ticks & Leeches" (2001).

example, in "Ticks & Leeches," the track that succeeds "Parabola" on Tool's *Lateralus* (2001), the guitar establishes a double tresillo over a slow, two-and-a-half-minute build-up with minimal drums; then, following a short fermata, the guitar part continues, with added heavy distortion, beneath an explosive drum solo (see **Ex. 3.7**).

As my remarks on "Parabola" and "Ticks & Leeches" suggest, the music of Tool is rife with interesting tresillo-based permutations. While space does not allow for analyses of all of the relevant grooves, I have summarized four unique examples at the bottom of **Table 3.2**. Two of these articulate quadruple-tresillo patterns; the drumbeat of "The Pot" complicates matters further through a predominantly triple grouping of beats. "Forty Six & 2" is the only song in the corpus to alternate retrograde and single tresillo patterns.¹⁰ Finally, the meter of the primary riff in "Lateralus" can be understood as two measures of 9/8 followed by a measure of 6/8—a (3,3,2) structure related to the tresillo, though likely not perceived as an obvious relative. Beyond these idiosyncratic extensions of the tresillo, many irregular grooves by Tool and other artists borrow elements of the tresillo, or defamiliarize the pattern by placing it in a more complex context. As we will see, understanding common tresillo-family drumbeats can clarify irregular grooves, most often by inviting a listener to hear an extension or compression of a familiar 4/4 pattern. Conversely, knowledge of the tresillo and a willingness to hear it as metric can complicate our analysis of some grooves, in which elements of backbeat- and tresillo-variants vie for metric priority. The nuanced relationship of the tresillo family to other additive structures prompts challenging analytic questions in many irregular grooves.

Triple Patterns: Between Regular and Irregular

Like the tresillo and related patterns, meters that involve regular triple patterning occupy a space somewhere between the regularity of the standard rock beat and the irregular grooves surveyed in subsequent chapters. The best-known theorizations of rhythm and meter align with the common-sense assumption that meters like 6/8 and 3/4 are best understood under the rubric of "regular,"

¹⁰ The resulting structure is related to double tresillo through rotation in a manner that recalls the modes of a scale (for discussion of rhythmic rotation, see Toussaint 2013, 73–83).

alongside meters like 4/4 and 2/4.¹¹ The notion that these meters are equivalently regular is inherited from European classical music, wherein all of the meters in question are relatively common; however, in rock and pop repertoire, meters with triple patterns are decidedly less common than their duple counterparts.¹² For example, of the 2000 songs I analyzed from *Billboard's* “The Hot 100” (see Chapter 2), only ninety-nine (fewer than 5%) contain sections in 3/4, 6/8, or 12/8. Moreover, over half of these (as many as sixty-four songs) are in a doo-wop or similar 12/8 feel, which some analysts might prefer to transcribe as 4/4 time with triplets.¹³ Only twenty-one songs (just over 1%) could reasonably be said to be in (or contain sections in) 3/4 time and only two of these were released after 1990.¹⁴

Because the most regular compound meters (6/8 and 12/8) are somewhat common, and because the drumbeats of these meters are typically based on the same alternation of kick and snare that characterizes the (4/4) standard backbeat, I do not treat them in detail. For our purposes, two issues concerning triple patterning are more relevant: (1) drumbeats associated with 3/4 time and (2) the multiple possible metric relationships between song sections in 6/8 and 4/4. The former informs our expectations of irregular drumbeats when they contain groups of three beats or triple subdivisions. The latter demonstrates the importance of metric modulation in understanding metric irregularity. Regarding metric modulation, the different possibilities are most easily observed and compared in the context of sectional relationships but, as we will see in more complex analyses, the principles underpinning these transitions can also describe irregularities that occur at a more local hierarchical level. A third consideration pursuant to triple patterning—triple super-meter—is discussed in the following section.

¹¹ This is one implication, for example, of Lerdahl and Jackendoff's (1983, 69–72) third and fourth Metric Well-Formedness Rules. In London's (2012) theory, “non-isochronous” meters prompt special considerations (see Ch. 7 and 8 and cf. the Well-Formedness Constraints presented in Ch. 4 and 7). The distinction between regular and irregular meters is drawn somewhat more plainly in dictionaries and encyclopedias of music as, for instance, in Alison Latham's entry in *The Oxford Companion to Music*: “In Western music metre is generally duple [in which she includes 4/4] . . . or triple” (s.v. “Metre”).

¹² Regarding rock, Stephenson's generalization that “steady backbeats . . . usually help make the length of a measure clear” is suggestive of the relative paucity of triple (and compound) meters in the genre.

¹³ On the ambiguity of notating rock and pop songs in meters with a triple beat or pulse, see de Clercq (2016).

¹⁴ In fact, both examples were released in 2014 or later. Regarding earlier trends in the use of 3/4 time, the clearest examples—and the largest proportion thereof—are found in the first years of “The Hot 100” (1958–60). From 1961–89, songs in 3/4 are less common and their metric identities more ambiguous, leading eventually to the disappearance of triple meter from the top three spots of the pop chart from 1990 until recently.

TRIPLE METER

Within the corpus, 3/4 time is relatively common in song sections and shorter passages of two to four measures. Even among the larger sample of songs analyzed for this project, none of those released after 1990 are unambiguously in 3/4 throughout (though, any such songs would be excluded from the corpus based on the selection criteria outlined in Chapter 2).¹⁵ This observation is especially curious because songs in 12/8 and 6/8 meters throughout are not uncommon. Of the most common triple-patterning possibilities, then, 3/4 time is underrepresented within recent pop music. Moreover, the use of 3/4 in rock music is correlated with other sorts of metric idiosyncrasy. I interpret 3/4 time as the best fit for sections of twenty-one songs (see **Table 3.3**). Two main strategies emerge, which closely recall the two most common tresillo drumbeats—undifferentiated and double-continuation patterns.

Undifferentiated articulation of 3/4 time is more straightforward than in tresillo-family grooves as the articulations are evenly spaced. While undifferentiated triple meter is not uncommon, a single kick articulation followed by two on the snare is clearer and more common—as with the single tresillo. The first of these snare articulations remains the more important cue for this metric interpretation. In **Table 3.3** the subdivision of the category entitled “Strong 2nd-Beat Articulation” is somewhat artificial; those drumbeats in which beat three is articulated by a tom (as in Muse’s “Animals”) or by the kick drum (as in Amos’s “Black-Dove”) are best conceived as falling somewhere between the two-snare model and those songs in which beat three is not articulated. An excerpt from the first prechorus of Amos’s “Fast Horse” (see **Ex. 3.8**) exemplifies the gradations among these closely related drumbeats. Within four successive measures the drummer plays three variants of the beat: Kick – Snare – Kick in the first two measures; Kick – Snare – Snare in the fourth measure (the second snare initiating a fill); and, in the third measure, a pattern in which the second snare articulation is displaced a sixteenth note after its expected arrival on beat three.¹⁶

¹⁵ One of the two songs noted above, “Earned It” by The Weeknd, could arguably be in a slow 6/8. The other, Hozier’s “Take Me to Church,” is only partially in 3/4 and is therefore in the corpus.

¹⁶ A fourth possible drumbeat, similar to this last variant, occurs when the second snare is a full eighth note late (i.e., Kick – Snare – [eighth rest] Snare). When such a beat forms the main groove of a song section, without the context of a more stable triple articulation, it is typically best interpreted as denoting 6/8 time (e.g., A Perfect Circle’s “The Outsider”). Amos’s “Star of Wonder” is a possible exception in which a similar beat (with hi-hats replacing the snare articulations) teases against a groove that otherwise suggests triple meter.

Drumbeat		Artist—Song (year)
Undifferentiated	Snare (x3)	Disturbed—“Inside the Fire” (2008)
	Kick (x3)	Dream Theater—“Metropolis Part 1: The Miracle and the Sleeper” (1992)
	Kick (x3)	Hail the Sun—“Testostyrannosaurus” (2012)
	Kick (x3)	Hozier—“Take Me to Church” (2013)
	Snare (x3)	Metallica—“The Day that Never Comes” (2008)
Strong 2nd-Beat Articulation	Kick – Snare – Snare	Ben Folds—“Bastard” (2005)
	Kick – Snare – Tom	Muse—“Animals” (2012)
	Kick – Snare – Snare	Tool—“The Patient” (2001)
	Kick – Snare – Snare	Tool—“The Pot” (2006)
	Kick – Snare* – Kick	Tori Amos—“Black-Dove (January)” (1998)
	Kick – Snare – Snare	Tori Amos—“Fast Horse” (2009)
	Kick – Tom – Tom	Vanessa Hudgens—“Last Night” (2008)
Double-continuation	Kick – Snare – [rest]	Hozier—“Take Me to Church” (2013)
	Kick – Snare – [rest]	Matt McAndrew—“Take Me to Church” (2013)
	Kick – Snare (x3; tresillo)	TTNG—“Rabbit” (2008)
Snare on Beat Two Only	Kick – Kick Kick – Snare	Hail the Sun—“Eight-Ball, Coroner’s Pocket” (2012)
	Kick – [rest] – Snare	Tool—“Rosetta Stoned” (2006)
	Kick – [rest] – Snare	Tool—“Right in Two” (2006)
Single-continuation/Snare on Beat Three Only	Kick – [rest] – [rest]	Michael Penn—“Seen the Doctor” (1992)
	8-mm irregular pattern	OSI—“Memory Daydream Lapses” (2003)
	[no kit, upright bass plays quarters]	Sting—“St. Augustine in Hell” (1993)
Underdetermined	[eighth notes in hi-hats]	Tool—“Enema” (1996)

* The snare of the 3/4 beat in Amos’s “Black-Dove” consistently anticipates beat two by a sixteenth note. This displacement does not destabilize a triple-meter interpretation, in part because the same anticipation is thematic to nearly all of the song’s drumbeats (including 4/4 and 7/4 passages; regarding the latter see **Table 4.5**).

Table 3.3: List of repeating triple-meter grooves in the corpus.

The musical score consists of two staves. The top staff is for the Voice, starting with a C major chord (C, E, G) followed by a G minor chord (G, B, D), an A minor chord (A, C, E), a D minor chord (D, F, A), another A minor chord, a G minor chord, and an A minor chord again. The lyrics "Girl you got to find you the man who can smoke this out. Bad me-di cine__" are written below the vocal line. The bottom staff is for the Drums, showing a continuous pattern of eighth-note pairs (X) on the first two beats of each measure, followed by a rest or silence on the third beat, and then continuing the pattern on the fourth beat.

Example 3.8: Variation within a standard triple-meter drumbeat in Tori Amos’s “Fast Horse” (2009).

A more consistent but also more exceptional drumbeat occurs in the verse of TTNG’s “Rabbit,” in which the second and third beats are overwritten by a tresillo in the snare (see **Ex. 3.9**). While the

A musical score for drums in 3/4 time. The tempo is marked as $\text{♩} = 133$. The drum part consists of six measures. The first measure shows a downbeat kick (solid vertical bar) followed by six eighth-note patterns. The second measure shows a downbeat kick followed by six eighth-note patterns. The third measure shows a downbeat kick followed by six eighth-note patterns. The fourth measure shows a downbeat kick followed by six eighth-note patterns. The fifth measure shows a downbeat kick followed by six eighth-note patterns. The sixth measure shows a downbeat kick followed by six eighth-note patterns.

Example 3.9: A unique triple-meter drumbeat in the verse of TTNG’s “Rabbit” (2008).

A projective analysis of an instrumental breakdown in Tool’s “Rosetta Stoned.” The score includes three staves: Electric guitar, Bass, and Drums. The tempo is marked as $\text{♩} = 117$. The electric guitar and bass play eighth-note patterns. The drums play a rhythmic pattern with various articulations labeled with letters (Q, R, etc.) and arrows indicating continuation points. The bass staff has a note head with a question mark above it, suggesting a metric projection. The drums staff has a note head with a question mark above it, suggesting a metric projection.

Example 3.10: Projective analysis of an instrumental breakdown in Tool’s “Rosetta Stoned” (2006).

loosening of straightforward three-beat articulations might be expected to promote some metric ambiguity (exacerbated by the guitar ostinato), I find it very difficult to hear this passage in, for example, 6/8. In the absence of a mid-measure kick drum, the metric continuation implied by the beat-two snare establishes a regular expectation for beat duration, which preempts interpretations other than triple meter.¹⁷

A third drumbeat possibility, apart from undifferentiated and strong second-beat articulations, is the single-continuation pattern formed by a downbeat kick drum and a third-beat snare. While apparently as common as the “Snare on Beat Two Only” pattern identified in **Table 3.3**, songs in which the snare continuation is delayed until beat three have an altogether different groove than those with strong second-beat articulation. In my analysis of an excerpt from Tool’s “Rosetta Stoned,” the unrealized projection S captures the off-kilter feeling of the drumbeat’s uneven metric implications (see **Ex. 3.10**). In “Rosetta Stoned,” this feeling is mitigated by the grouping

¹⁷ As heard in the listening example, my 3/4 interpretation is supported by cues in the pitch organization of the passage (not transcribed). For example, the E♭ in the low register of the guitar part, repeated on the second beat of every measure, emphasizes the metric potential of those beats.

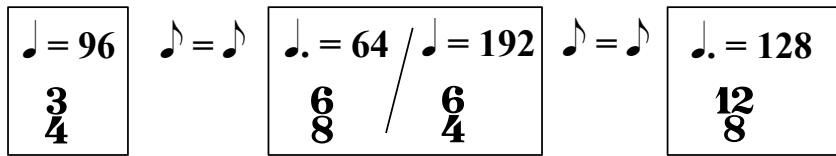


Figure 3.1: Complications in notating three related grooves.

dissonances of other instruments in the passage, which reinforce the regularity of the measure. In both of the other songs that employ this beat, it is interspersed with measures of other non-triple meters—perhaps in part because of the unusual projective profile. The grooves of both “Eight-Ball, Coroner’s Pocket” (Hail the Sun, 2012) and “Right in Two” (Tool, 2006) only remain in 3/4 for three consecutive measures at a time; in both songs, these short triple excursions are folded into larger, repeating patterns (see Chapter 5).

In addition to the relatively stable drumbeats discussed so far, triple meter can be suggested in contexts with more ambiguous percussive cues.¹⁸ Songs I hear in 3/4, despite the absence of a clear, three-beat drum part, are listed under the heading “underdetermined” in **Table 3.3**. These are not to be confused with undifferentiated beats, in which the articulation of all three beats is present but uniform. All four of the underdetermined examples afford non-3/4 interpretations; a more complete investigation of triple meter would benefit from the close analysis of each.

Further complications arise in songs that contain metric modulations between meters with various mixtures of duple and triple patterning (at different hierarchical levels).¹⁹ Consider, for instance, a hypothetical song with a consistent sub-beat pulse across three distinct grooves, each of which subdivides the measure triply at a different hierarchical level in an otherwise duple structure (see **Fig. 3.1**; hypothetical metronome markings are offered to facilitate comparison of the three grooves). If the triple subdivision occupies the highest or lowest hierarchical level, the resulting meter will likely be heard as 3/4 or 12/8 (or two measures of 6/8), respectively. If, however, the triple subdivision occupies the middle hierarchical level, the resulting meter is unclear: in relation to the 3/4 groove, it will be understood as 6/8 time, with a consistent eighth-note pulse; in relation to the 12/8 groove, the curious signature of 6/4 seems the best fit (again, retaining a consistent eighth

¹⁸ This is, of course, impossible with tresillo-family grooves, the metric identities of which rest on the clear articulation of specific rhythmic patterns.

¹⁹ Much has been written on the subject as it pertains to the classical repertoire, especially concerning the music of Brahms and R. Schumann (see, e.g., Krebs, 1999; Cohn, 2001; Murphy, 2009). Gotham (2015) offers a theoretical model of these issues that also considers several non-classical musical traditions. Tool shows a special affinity for this sort of metric play on their second full-length release, *Ænema* (1996; e.g., “Pushit,” “Ænema,” and “Third Eye”).

note). This illustration supports the notion, explored in Chapter 1, that the descriptive value of the time signature is limited when representing metrically ambiguous situations. In extending this hypothetical model to the analysis of recorded music, the best analysis will differ from case to case, but, from a theoretical perspective, no solution is entirely satisfactory.

SHIFTS BETWEEN SEXTUPLE AND QUADRUPLE

More common than the sort of metric ambiguities noted above are songs in which metric modulation associates a triple-patterned meter with a standard 4/4 groove. In relating meters that share a consistent beat level (e.g., 3/4 and 4/4), metric modulation is exceedingly rare—the tempo of the beat is typically maintained. When relating simple and compound time (e.g., 4/4 and 6/8), there are at least two metric relationships that occur with some regularity: pulse-retaining and measure-retaining.²⁰ Two further possibilities arise when half- or double-time metric shifts accompany a metric modulation; these are understandably less common than their simpler analogues. **Table 3.4** summarizes all of these metric relationships, alongside figures indicating how many songs from the corpus contain straightforward metric modulations of each type.

Unsurprisingly, the pulse-retaining type is most common by far. In addition to the eighteen examples that juxtapose regular meters (4/4 and 6/8), many songs in the corpus employ pulse-retaining metric shifts that involve irregular meters. Of course, such transitions are not necessarily understood as metric modulations if the pulse level falls in a comfortable tactus range. Often, however, the perceived tactus is associated not with the consistent hierarchical level—the eighth note in the most common case—but, rather, with the quarter (in 4/4) and dotted quarter (in 6/8). Such cases, in which two grooves share a common pulse but not a common beat, necessitate metric modulation. Two related phenomena are worth highlighting. First, because of the metric relevance of the dotted quarter note to 6/8 meters, it is not uncommon for a song to emphasize the same duration within common-time sections, resulting in a tresillo-family groove. Examples can be found at both ends of the commercial-transgressive spectrum (see, e.g., Goo Goo Dolls’s “Iris” [1998] and

²⁰ Osborn (2017, 63–71) differentiates between “beat-preserving” and “beat-changing” strategies, both of which retain an underlying pulse. The best approximation of my “measure-retaining” type I have found in the literature comes from Waters (1996, 24–26), who uses the terms “measure-preserving” and “tactus-preserving” to describe different classes of polymeter (what I call cross-rhythms). My use of terms based on “retaining” rather than “preserving” seeks to differentiate the simultaneous presentation of two pulse streams (as in Waters’s examples) from cases of metric modulation, in which the different pulse streams belong to adjacent measures (though this is likely vain in view of Osborn’s use of “preserving” terms to denote adjacent meters).

Commonality	Relationship		Frequency Within Corpus	
	Tempo	Meter		
Pulse	$\text{♩} = \text{♩}$	$4/4 \Leftrightarrow 6/8$	18	Common
	$\text{♩} = \text{♩}$	$4/4 \Leftrightarrow 6/16$	2	Rare
Measure	$\text{♩} = \text{♩.}$	$4/4 \Leftrightarrow 6/8$	6	Uncommon
Pulse (+ half-/double-time)	$\text{♩} = \text{♩}$	$4/4 \Leftrightarrow 3/4 (\times 2)$	2	Rare
Measure and Beat (<i>not</i> Pulse)	$\text{♩} = \text{♩.}$	$4/4 \Leftrightarrow 12/8 \text{ (or } 6/8 \times 2\text{)}^*$	1	Rare

* I have omitted shifts between straight and swung time from this summary, though they too are rare (see, e.g., Hozier's "From Eden" [2014]).

Table 3.4: Possible relationships between 4/4 time and various common triple and compound meters.

The musical score consists of two staves. The top staff is for the Voice, and the bottom staff is for the Drums. The key signature is F major (one sharp). The tempo is marked as $\text{♩} = 76$. The vocal line starts with a melodic line in 4/4, followed by a section in 6/16. The lyrics are: "come on come on come on come on come on". The drums provide a steady eighth-note pulse throughout. The bottom staff shows the drums playing eighth notes in 4/4 time, which align with the sixteenth-note pulses in the vocal line. The vocal line then shifts to a section in 6/16, with lyrics: "so then when did you then begin your craving for". The score continues with another section in 4/4, followed by 6/16, and then 4/4 again. The vocal line includes lyrics: "white powder exotic matter that cells divide". The drums maintain their eighth-note pulse throughout these changes.

Example 3.11: Pulse-retaining metric modulation between 4/4 and 6/16 in Tori Amos's "Witness" (2005).

Tool's "Third Eye" [1996]). Second, on rare occasions we encounter cases that implicate the sixteenth note as the common element between two meters. These might be considered a sub-category of pulse-retaining metric modulations. The chorus of Tori Amos's "Witness" exemplifies both compound patterning at the sixteenth-note level and the presence of tresillo elements within a metric modulation (see **Ex. 3.11**). The tresillo in question is somewhat obscured, coming after three

The musical score consists of two staves. The top staff, labeled 'Pitched instruments', shows a treble clef, a key signature of one sharp, and a tempo of $\text{♩} = 175$. It features six measures of music. The first five measures are in 6/8 time, with each measure containing two groups of three eighth-note pulses. The sixth measure begins with a key change to ♯, ♯, ♯ (three sharps) and a time signature change to 4/4. The bottom staff, labeled 'Drums', shows a bass clef, a key signature of one sharp, and a tempo of $\text{♩} = 175$. It features six measures of music. The first five measures are in 6/8 time, with each measure containing two groups of three eighth-note pulses. The sixth measure begins with a key change to ♯, ♯, ♯ (three sharps) and a time signature change to 4/4. The score includes labels for 'strings' and 'guitars, bass'.

Example 3.12: Measure-retaining metric modulation between 6/8 and 4/4 in R.E.M.’s “Shiny Happy People” (1991).

measures of compound meter (see the measure notated in 2/4 time). On a first listening, one is likely to hear a continuing 6/16 passage followed by an unusual adjustment.²¹

The second relatively common possibility—measure-retaining metric modulation—occurs when the tempo of a common-time quarter-note beat is increased by half, becoming the eighth-note pulse of a compound meter (or the inverse of this). Put another way, each pair of two quarters is replaced by a quarter-note triplet.²² The introduction of R.E.M.’s “Shiny Happy People” exemplifies the inverse case, beginning with a short passage in 6/8 (or possibly 3/4) before shifting into the 4/4 that characterizes most of the song (see Ex. 3.12).²³ My preference for a 6/8 reading of the introduction is based not only on the elegance of preserving the measure length between the two meters but also on the snare (rim knock) articulation of a compound backbeat.

When considering the uncommon cases in which metric modulation coincides with half-time or double-time changes to the groove, the hallmarks of different triple and compound meters are indispensable to our analysis. Morrissey’s “Tomorrow” follows a similar metric-formal layout to that of “Shiny Happy People”: it begins in a slow 6/8 (or 3/4, or 6/4) and shifts to 4/4 before the first verse (see Ex. 3.13). Both songs also revisit their respective compound grooves at a later point. Moreover, despite the even slower tempo of Morrissey’s 6/8 passages (as compared to the R.E.M. song), the backbeat emphasis in the drums suggests a compound meter. An important distinction between the two songs is the relationship between these slow compound-time introductions and the

²¹ Were an additional measure of compound meter to precede the 2/4 measure, the result would be an extended tresillo that could be parsed as remaining in common time throughout. Indeed, a listener familiar with the extended tresillos of Tool and other progressive rock groups may initially expect this possibility to be realized. The passage as written will likely prove more disorienting for this hypothetical (conservative) listener than for the (radical) one who embraces the 6/16 interpretation more readily.

²² Although the members of this triplet will most be often notated as eighth notes, there are cases at slower tempi in which retention of the quarter note would result in a more intuitive transcription.

²³ An early example of this type of metric modulation is found in The Beatles’s “We Can Work it Out” (1965), noted in Everett (2001, 322).

The musical score consists of two staves: Bass and Drums. The tempo is marked as $\text{♩} = 138$. The Bass staff is in 6/8 time, indicated by a '6' over the staff. The Drums staff is also in 6/8 time. The score is divided into measures labeled E, D, A, and B. Measure E starts with a dotted half note followed by a dotted quarter note. Measure D continues the 6/8 pattern. Measure A begins with a dotted half note followed by a dotted quarter note. Measure B starts with a dotted half note followed by a dotted quarter note, indicating a change to 4/4 time, as shown by the '4' above the staff. The bass part maintains a steady eighth-note pulse throughout. The drums provide a 6/8 feel with sixteenth-note patterns, including patterns with asterisks (*) and triplets (3).

Example 3.13: Pulse-retaining metric modulation with double-time shift from slow 6/8 to moderate 4/4 in Morrissey’s “Tomorrow” (1992).

ensuing 4/4 grooves. In “Tomorrow” there is no tangible connection between the measure lengths in the two meters; rather, the four-to-the-floor kick that signals the shift to 4/4 (in quarter notes) retains the (eighth-note) pulse of the previous 6/8 beat. Hence my identification of a double-time shift alongside the metric modulation.

The final type of metric modulation listed above is simpler than it seems. While a measure-retaining metric modulation with double-time shift (from 4/4 to 6/8) would technically result in two measures of the latter meter filling the space of one measure of the former, it is overwhelmingly more likely that two such measures are heard as a single measure of 12/8 time, negating the feeling of a double-time shift. As with the basic pulse-retaining type, this relationship is easily understood without recourse to metric modulation: the transformation in question can be explained more simply as a shift between simple and compound meters of the same cardinality. Given the potential ease with which such a transition might be effected, I was surprised by the scarcity of examples of this type in the corpus. (More common by far are the sort of shifts between compound and triple grooves summarized in **Fig. 3.1**.) The only song that demonstrates this shift in its simplest form is Dream Theater’s “A Nightmare to Remember.” In the song’s second chorus, the same vocals are accompanied by two variants of a half-time groove—first in 12/8 (or triplets); then in 4/4, with a steady sixteenth-note pulse (see **Ex. 3.14**). Note the work done by the drum fill (last measure of the second system) in negotiating the transition from one feel to the other.

♩ = 136

The musical score consists of three staves. The top staff is for the Voice, starting at measure 125. The middle staff is for the Drums. The bottom staff is also for the Voice, starting at measure 129. The key signature changes throughout the measures. Measure 125 starts in E♭m (12/8), moves to C♯m (12/8), then Dm (12/8), and finally Fm (12/8). Measure 126 starts in Cm (12/8), moves to A♭m (12/8), then Bm (12/8), and finally Dm (12/8). Measure 127 starts in E♭m (12/8), moves to C♯m (12/8), then Dm (12/8), and finally Fm (12/8). Measures 128 and 129 start in E♭m (4/4), move to C♯m (4/4), then Dm (4/4), and finally Fm (4/4). The lyrics are: "stunned and be - wil - dered cold and a - fraid" (measures 125-127), "torn up and bro - ken fright - ened and dazed" (measure 126), and "stunned and be - wil - dered cold and a - fraid" (measures 128-129).

Example 3.14: Measure-retaining metric modulation from 12/8 to 4/4 in the second chorus of Dream Theater’s “A Nightmare to Remember” (2009).

Outside of strict compound-simple relationships like the Dream Theater example, the same ratio of 3:2 allows for many more complex metric modulations. In Amos’s “Hotel,” for instance, the quarter-note pulse in the 4/4 chorus and post-chorus is nearly equivalent to the prominent dotted quarter in the verse and prechorus tresillo (see **Ex. 3.15**; the distinction between the actual tempo of 120 bpm and the 126 bpm predicted by the earlier section is imperceptible in practice). This relationship is obscured by a fermata between the post-chorus and subsequent verse; however, if written out, this fermata comprises two beats at the slow tempo and two at the fast. I have transcribed this transition as two measures of 2/4, allowing the retention of some definition of quadruple time through the passage.²⁴ Until closely acquainted with the song, a listener is more likely to perceive a simple overlapping, in which the vocalist maintains a full bar of slow 4/4 and the

²⁴ It could also be argued that the transitional fermata spans five beats at the quicker (verse) tempo—the two 2/4 measures are metrically equivalent to a (3,3)(2,2) division of this hypothetical five-beat measure. A full analysis of the song could connect this isolated (potentially 5/4) measure to the later bridge, in which quintuple meter plays a significant role (see **Table 4.1**).

$\text{♩} = 84$

thin texture; harmonies uncertain

(with quarter-note delay
and generous reverb)

Voice

Drums

40 $\text{♩} = \text{♩.}$ ($\text{♩} = 120$)

met 'm in a ho - tel met 'm in a ho - tel they

crash

synth; pitch indeterminate

electronic or heavily processed

Example 3.15: Metric modulation with a 3:2 ratio between two 4/4 grooves in Tori Amos's "Hotel" (1998).

instrumental track begins of its own accord, initiating a change of tempo at the downbeat. This may even be the desired effect, and the spectre of the meter change simply an artefact of the process of digital recording with a printed click track.

All of the basic patterns discussed thus far are fairly common in the corpus, and few of the examples could be described as irregular (the passage from Amos's "Witness" is a possible exception). Knowledge of common triple-meter grooves and types of metric modulation will underpin our consideration of larger odd-cardinality patterns.

Super-Metric Patterns

Repeating irregular patterning at the super-metric (half-note) level is relatively common within the corpus. Forty songs include at least one passage characterized by a super-metric pattern, with six containing two such patterns. Ten of these examples are by Radiohead, ten by Tool, and five by Tori Amos. Two songs (OutKast's "Hey Ya!" and Radiohead's "Bones") are in the same super-metric pattern throughout. A further three (Mumford and Sons's "Lover of the Light," Radiohead's "I Might Be Wrong," and TTNG's "Rabbit") exhibit recurring patterns rather than repeating ones; that is, the consistency of these patterns within their parent song is established not by the cyclic looping

Super-Meter	Notes	Artist—Song (year)
	See also Quintuple	Dream Theater—“A Nightmare to Remember” (2009)
	Fills in 2/4 measures (end)	Pearl Jam—“The Fixer” (2009)
		Radiohead—“Black Star” (1995)
		Radiohead—“Idioteque” (2000)
		Radiohead—“Go to Sleep (Little Man Being Erased)” (2003)
Triple (3)	Fills in 2/4 measures (end)	Soundgarden—“Black Hole Sun” (1994)
	12/8 cross-rhythm in guitar	Tool—“Undertow” (1993)
	Fills in 2/4 measures (start)	Tool—“Stinkfist” (1996)
	12/8 cross-rhythm in guitar	Tool—“Eulogy” (1996)
		Tool—“Pushit” (1996)
		Tool—“Jambi” (2006)
	Fills in 2/4 measures (end)	Tori Amos—“Happiness is a Warm Gun” (2001)
	See also Quintuple	Tori Amos—“Giant’s Rolling Pin” (2014)
Quintuple (5)	5:2 ratio with guitar ostinato	Gorillaz—“5/4” (2001)
	See also Triple	Pearl Jam—“The Fixer” (2009)
	Some snare displacements	Tori Amos—“Police Me” (2009)
	See also Triple	Tori Amos—“Giant’s Rolling Pin” (2014)
	Not a strictly super-metric irregularity; see Ex. 3.20	
Septuple (7)	Full-song (2,1)(2,2)	Of Monsters and Men—“Crystals” (2015)
	(2,1)(2,2)	Radiohead—“Bones” (1995)
	(2,2)(3) 3-group ambiguous	Radiohead—“Lucky” (1997)
	(2,2)(2,1)	Radiohead—“Scatterbrain (As Dead as Leaves)” (2003)
		TTNG—“Gibbon” (2008)
	(2,2)(2,1,2)	Mumford & Sons—“I Will Wait” (2012)
Nonuple (9)	(2,2,1)(2,2)	Radiohead—“Ripcord” (1993)
	(2,1,2)(2,2)	Tori Amos—“Ireland” (2005)
	(2,2)(2,3)	TTNG—“Gibbon” (2008)
Decouple (10)	(3,3,4)	Toadies—“Possum Kingdom” (1994)
Undecouple (11)	(4,3)(4)	Mumford & Sons—“I Will Wait” (2012)
	Full song (4,3)(4)	OutKast—“Hey Ya!” (2003)
Tredecouple (13)	(3,3)(4,3)	Ben Folds—“Bastard” (2005)
	13:2 ratio with guitar ostinato	TTNG—“Rabbit” (2008)
Quattuordecouple (14)	(4,3)(3,4)	Radiohead—“I Might Be Wrong” (2001)
Novemdecouple (19)	(2,3)(4,4)(2,4)	Mumford & Sons—“Lover of the Light” (2012)

Table 3.5: List of songs in the corpus with repeating irregular super-metric patterns over a standard rock beat.

The musical score for Pearl Jam's "The Fixer" shows three staves: Voice, Electric guitar, and Drums. The tempo is 152 BPM. The score illustrates various super-metric patternings and a consistent backbeat. The drums play a steady backbeat throughout, while the electric guitar and voice provide harmonic and rhythmic variety. Measure numbers 1 through 6 are indicated above the staves.

Example 3.16: Consistent backbeat across various super-metric patternings in the first measures of Pearl Jam's "The Fixer" (2009).

of a groove state but rather through multiple statements of an idiosyncratic (and thus easily identifiable) metric idea over the course of the song.²⁵ Unsurprisingly, the predominant drumbeat in this collection of songs and passages is the standard rock beat, which naturally accommodates half-measures (from the perspective of 4/4 time). Of the forty-six patterns analyzed, thirty-three (about 72%) do not depart substantially from the standard backbeat (see **Table 3.5**). The opening of Pearl Jam's "The Fixer" exemplifies the use of backbeat variants across multiple grooves with varying cycle lengths (see **Ex. 3.16**). The snare falls consistently and almost exclusively on the backbeat, seamlessly connecting the quintuple intro to the triple verse and the verse to the normative 4/4 chorus (the listening excerpt continues beyond the transcribed passage).

Within this subset of the corpus, smaller irregular cardinalities are more prevalent than larger ones, as is the case with most metrically irregular phenomena. The examples in triple super-meter are unique for including a high concentration of short drum fills, which clarify the irregular metric

²⁵ For more, see my discussion of TTNG's "26 is Dancier than 4" (**Ex. 4.20**) in the next chapter.

Example 3.17: Recurrent drum fills clarify the super-metric structure of several instrumental passages in Radiohead’s “Black Star” (1995).

situation.²⁶ In Radiohead’s “Black Star,” for example, single measures of standard-backbeat 4/4 are punctuated by two-beat fills with a tresillo rhythm (see **Ex. 3.17**). In the choruses of Tool’s “Eulogy,” a similar alternation places 2/4 fills ahead of measures of regular 4/4 backbeat, inverting the expected Platonic-trochaic subdivision of the triple super-meter.²⁷ Patterns that span more than three half notes retain the standard rock beat or a variant thereof with great consistency, relying instead on harmonic rhythm, guitar ostinatos, or vocal phrasing to clarify the super-meter. The tendency towards Platonic-trochaic subdivision just noted is prevalent in triple super-meter and longer patterns alike. Because they afford more subdivisional flexibility, I have supplied shorthand analyses in the “notes” column of **Table 3.5** to clarify the patterning of examples with larger cardinalities.

Before turning to those examples in which the standard rock beat is not retained, it is worth considering briefly the sort of complications that may accompany a regular, backbeat-based drum part. In Gorillaz’s “5/4,” a guitar ostinato of ten eighth notes is clearly divided as 5+5 in its initial, unaccompanied presentation, and then set against a standard backbeat in the kit (see **Ex. 3.18**). Five alternations of kick and snare elapse in the same span as two rotations of the guitar ostinato, leading me to hear a repeating quintuple pattern at the super-metric level.²⁸ At the very beginning of the song, my ear is drawn to the eighth-note level, which is also quintuple, before the guitar rhythm is overridden by the emphatic drums. So why would the group call the song “5/4” (and not “5/8” or “5/2”)? Perhaps the chosen title simply has a more familiar ring to it than these alternatives, but I do not wish to discount the possibility that some members of the group hear the guitar ostinato—

²⁶ A related case is the milder modification to the beat observed in my Chapter 1 discussion of “Hey Ya!,” in which the 2/4 measure was the only one with an unembellished kick-drum rhythm.

²⁷ The proposed (2,1) subdivision of triple super-meter in “Black Star” and the (1,2) subdivision in “Eulogy” both require single-pulse units. The hierarchical stress implied by these structures is relatively mild at the super-metric level, though it contributes to the distinctive quality of the grooves in question.

²⁸ A similar interaction occurs in TTNG’s “Rabbit” where a longer guitar riff sets a repeating pattern of thirteen quarter notes against the drummer’s consistent alternation of kick and snare.

$\text{♩} = 96.5$ could be in 5/8 time?

Guitars acoustic guitar

doubled by electric guitar

guitars continue, drum backbeat emphasizes ♩

Voice

Drums

ma - gic for me ma - gic make no sound it good

for me it good for me un - der - ground

Example 3.18: Quintuple patterning at multiple hierarchical levels in Gorillaz’s “5/4” (2001).

specifically, the ten-eighth duration and not the constituent five-eighth riffs—as primary in their metric understanding of the groove.

Like “5/4,” two songs by Tool contain cross-rhythms between the drums and guitar. “Stinkfist” and “Pushit” are both from Tool’s sophomore release—*AEnima* (1996); both contain sections in triple super-meter; and, in both cases, a guitar cross-rhythm suggests a regular compound meter as an alternative identity for the passage. **Example 3.19**, from the first chorus of “Stinkfist,” demonstrates the resulting groove. Note the cymbals throughout the passage: the ride emphasizes quarter notes, supporting the backbeat, but the placement of crashes on the first and fourth beats of the 4/4 measure lends some credence to the guitar’s cross-rhythm. Likewise, some of drummer Danny Carrey’s fills support the latent compound-meter; however, the snare remains resolutely on the backbeat. Cases like this one extend my earlier discussion of metric ambiguity (in instances when one of several levels is patterned in 3s) beyond considerations of meter to the super-metric level.

My final example of standard-backbeat super-metric irregularity comes from the chorus of “Crystals” (Of Monsters and Men, 2015), in which the harmonic rhythm and vocal phrasing challenge the drumbeat (see **Ex. 3.20**). This is a rare case in which I have difficulty hearing the

A musical score excerpt for "Stinkfist" by Tool. The top staff shows an electric guitar part with a tempo of $\text{J} = 88$. The bottom staff shows a drums part. Both parts are in 4/4 time. The guitar part features chords E⁵, C⁵, D⁵, and E⁵ F⁵. The drums part includes a complex cross-rhythm with various strokes and rests. A bracket indicates a 3 \downarrow measure. The score is transcribed with standard musical notation including stems, beams, and rests.

Example 3.19: Triple super-meter with a regular compound cross-rhythm in Tool's "Stinkfist" (1996).

A musical score excerpt for "Crystals" by Of Monsters and Men. The top staff shows a voice part with a tempo of $\text{J} = 132$ and harmonic rhythm changes between F(add2), C, and G. The lyrics include "doubled 8vb woah". The bottom staff shows a drums part. The score transitions to a section starting at measure 39, indicated by a bracket above the vocal line. The vocal line starts on G, moves to F, and then to C. The lyrics are "tones that tremble down your spine woah". The drums continue their rhythmic pattern. The score is transcribed with standard musical notation including stems, beams, and rests.

Example 3.20: The standard rock beat challenged by harmonic rhythm and vocal phrasing in Of Monsters and Men's "Crystals" (2015).

drumbeat as the metrically determinate parameter, and this is reflected in my transcription.²⁹ At least four factors motivate the metric tension of this excerpt. First, the vocal anacrustes to the downbeats of the first three measures are melodically and rhythmically identical. Second, the harmonic rhythm not only reinforces the division of measures as transcribed in **Example 3.20** (in the move from A minor to G major) but also problematizes any analysis that consists only of 2/4 and 4/4 measures (in which either the A-minor or the second G-major triad would be held across a bar line). Third, the half-time feel of the chorus contrasts with the quick tresillo of the verse and prechorus, lending additional metric stability to each kick and snare in the chorus. It would be less disorienting in this

²⁹ Accordingly, the song is tallied alongside other examples of metric (and not super-metric) irregularity in the summary figures of Chapter 2.

Super-Meter	Drumbeat	Artist—Song (year)
Triple (3)	4/4 drums against 3/2 harmonic rhythm	Radiohead—“In Limbo” (2000)
	Two-beat fill, four-beat rest	Soundgarden—“Spoonman” (1994)
	Half-time (see Ex. 3.21)	Tool—“Swamp Song” (1993)
	12/8 against guitar half notes	Tool—“Ænima” (1996)
	Half-time (Kick – Snare – Kick)	Tool—“The Patient” (2001)
	Backbeat variant (snare displaced forward or overwritten)	Tool—“Schism” (2001)
	Half-time cross-rhythm	Tool—“10,000 Days” (2006)
	Minimal; articulates backbeat	Tori Amos—“America” (2014)
	Solo over guitar ostinato	TTNG—“26 is Dancier than 4” (2008)
Quintuple (5)	Undifferentiated eighths (kick)	Shinedown—“Sound of Madness” (2008)
	4/4 drums against 5/2 harmonic rhythm	Radiohead—“All I Need” (2007)
	Tresillo over last four beats	Tool—“Stinkfist” (1996)
	Half-time (Kick – Snare – Kick [x3])	Tool—“The Patient” (2001)

Table 3.6: List of songs in the corpus with repeating irregular super-metric patterns over non-backbeat drum parts.

context for a measure to begin with a snare articulation than it would be at a faster tempo and with an established expectation for backbeat metric rhetoric. Despite this contextual possibility, snare articulations of any beat are conspicuously absent from the two 3/4 measures—and this is the fourth factor in my reading of 3/4 time. In lieu of the snare, the crash cymbal marks the beats on which we might expect to hear the drum. The juxtaposition of the standard rock beat in the (4/4) first and fourth measures of the chorus with the snare’s absence in the intervening (3/4) measures not only clarifies the metric changes at hand; it also provides further evidence of the close relationship between snare backbeat and 4/4 time.

Among those cases of super-metric irregularity in which the drumbeat varies or abandons the standard rock beat, many songs employ the same sort of techniques just explored—ostinato, cross-rhythm, and/or competing metric layers. In some examples, the roles of instruments are reversed; in others, the (super-)metric influence of the drum kit is superseded by other factors. More often, these non-backbeat examples simply employ different beats within relatively stable grooves. **Table 3.6** summarizes the passages in question, which constitute the most varied selection of the corpus surveyed to this point. Notably, more than half of the examples are found in songs by Tool.

Despite their striking variety, most of the grooves listed in **Table 3.6** recall themes already discussed in this chapter. Many exemplify variations on or interruptions to the standard backbeat;

however, in two examples, the kit does not provide a fully-realized drumbeat of any sort. A short instrumental in Soundgarden’s “Spoonman” sees triple super-meter divided into 2+4 beats, with full-measure pauses separating licks in the guitar and snare drum. In “America,” Amos’s drumbeat, if it can be called one, consists of several mild percussive timbres (shaker, light cymbal work, etc.), which together reinforce a backbeat; as in the Of Monsters and Men example, the harmonic rhythm and vocals are more active in outlining the super-metric structure of this song. Harmony and vocals are also determinate in Radiohead’s “In Limbo” and “All I Need”: in both examples, the kit plays a 4/4 backbeat, which drifts in and out of sync with an odd-cardinality super-meter. Tool’s “Ænema” similarly pits a 12/8 drumbeat against a half-note guitar pulse that is (at least to my ears) the more metrically assertive layer of the arrangement. Two songs by Tool come close to articulating a standard rock beat: in “Stinkfist,” six beats of regular backbeat are punctuated by a sixteenth-note double tresillo; in “Schism,” the second snare is an eighth note later than expected and the third is replaced by a tom fill. In TTNG’s “26 is Dancier than 4,” we find a stable guitar ostinato underpinning a more virtuosic drum part (cf. Tool’s “Ticks & Leeches,” **Ex. 3.7**). Shinedown’s “Sound of Madness” is unique for its undifferentiated beat—a quarter-note pulse in the kick drum.

The only novel recurring approach within this list is the use of half-time grooves. All three examples come from Tool, spanning the group’s career from *Undertow* (1993) to *10,000 Days* (2006). The most recent of these, “10,000 Days” (the song), is similar to Radiohead’s “In Limbo” and “All I Need” insofar as it sets a quadruple backbeat against a triple super-meter, articulated by the rest of the band. The difference in this case is simply the half-time pacing of the kick-snare alternation. In the other two songs, the drumbeat participates in articulating odd-cardinality super-meters (see **Ex. 3.21**).³⁰ “The Patient” is the more straightforward of the two; the drumbeat consists of a kick-snare-kick articulation of three half-note beats, each of which receives an eighth-note anacrusis in the kick drum. **Example 3.21A** shows this beat alongside a five-eighth-note guitar cross-rhythm. “The Patient” employs a similar groove in its choruses, extending each measure through two additional (half-note) beats, both articulated by the kick (not transcribed).³¹

³⁰ These examples articulate what might be called a “proper” 3/2 time, in which the meter is composed of three beats, each a half note in duration. This is less common in rock music than the alternative type of 3/2—three measures of 2/4 or a combination of 2/4 and 4/4, as suggested by many other examples in this section.

³¹ This is the only instance of quintuple super-meter I encountered with a half-time drumbeat; cf. Dream Theater’s “A Nightmare to Remember” (**Ex. 4.6**), in which a half-time quintuple groove does not disrupt the 5/4 measure. See also **Example 5.11**, showing a related but more complex drumbeat in the prechorus of “The Patient.”

A

$\text{♩} = 55$

Electric guitar

Drums

(ostinato continues)

B

$\text{♩} = 65$

4 ♩ 3 ♩ 3 ♩ 2 ♩

Electric guitar

guitar doubled 8vb by bass

hats partially open

Drums

Example 3.21: Half-time triple meter in two songs by Tool: (A) “The Patient” (2001), (B) “Swamp Song” (1993).

The drumbeat in “Swamp Song” is largely the same as the triple super-meter groove in “The Patient,” but a few subtle differences encourage a more complex metric reading (see **Ex. 3.21B**). First, an additional kick on the second (quarter-note) beat results in a twice-articulated—or bisected—anacrusis to the first snare. The repetition of the two eighthths in the kick drum in beat four, together with the absence of any articulation of beat five, shrinks (or accelerates) the initial projection of two beats to one and a half (i.e., the second kick is marked for metric potential). A final kick and snare suggest the metric relevance of beat six, a projection that is again abbreviated with the periodic return to the beginning of the pattern. Rather than the expected (2,2,2) subdivision in quarter notes, the drums suggest (4,3)(3,2) in eighth notes. The placement of a snare on the second and fourth of these beats intensifies my inclination to hear a quadruple division in this groove. Nevertheless, triple super-meter remains an important frame at a higher level because of the strong continuation marked by the beat-three snare.

There is a clear commonality between the “Swamp Song” groove, the quintuple super-meter of “Stinkfist,” and the earlier example of TTNG’s “Rabbit” (cf. **Ex. 3.9**); in each of these drum parts, the final beats are overwritten by a familiar tresillo pattern. In both “Stinkfist” and “Swamp Song,”

the resulting acceleration of beat articulations can be understood as an outgrowth of Murphy's Platonic-trochaic model: the initial four-pulse unit (or three-unit run in "Stinkfist") and the subsequent three-pulse unit establish a first trochee, which overlaps with the onset of the second—a tresillo (3,3,2). In "Swamp Song," the alternation of kick and snare is crucial to this interpretation as it makes the (4,3) trochee sufficient to stand alone. Conversely, in "Rabbit," the three snare articulations following a single kick are better understood as a strange Platonic-iambic succession (4)(3,3,2), with an internally Platonic-trochaic comma. In this context, the familiarity of the tresillo as a stable pattern in its own right is a welcome antidote to the shifting durations of the non-isochronous succession.

All of the passages collected in **Table 3.6** are unique; moreover, some are debatable with regard to my super-metric classification. While the standard rock beat remains the most common approach within passages with super-metric irregularity (cf. **Table 3.5**), outside of this practice we find a wealth of creative and often complex ways of articulating triple (and some quintuple) super-meter. The greater prevalence of non-standard drumbeats within these songs, as compared to the larger sample surveyed in Chapter 2, wherein the backbeat was decidedly more pervasive, suggests an important distinction between hypermeter and super-meter. Regular hypermeter is correlated strongly with retention of the standard rock beat, whereas regular super-meter and the backbeat seem to have a more indifferent relationship (at least, in the small sample considered here). Indeed, three of the songs just discussed (Tool's "10,000 Days" and Radiohead's "In Limbo" and "All I Need") demonstrate that grooves based on the standard backbeat often implicate the measure level as the most salient periodic structure, despite the potential for half-note periodicity. These examples of super-metric irregularity thus demonstrate a high degree of internal consistency motivated first by hierarchical level, rather than by cardinality. For instance, quintuple super-meter is more closely related to triple super-meter than to quintuple meter. In Chapters 4 and 5, we will see that the opposite is true when considering irregularity at metric and sub-metric levels. Quintuple, septuple, and larger patterns all display consistency associated first and foremost with their respective cardinalities.

Before proceeding to larger-cardinality metric possibilities, a few words on the interaction of super-metric irregularity and form conclude my discussion of this hierarchical level. While no generalizable trends are apparent in the use of irregular super-meter among all of the artists considered, the music

of each of the three core artists evinces some potentially idiomatic inclinations. Radiohead often uses triple super-meter in introductions, instrumental sections, and outros, but seldom in the texted sections of their songs. While the refrain of “In Limbo” is an apparent exception to this trend, the drumbeat at least remains in 4/4 through the passage. When Radiohead employs larger odd-cardinality super-metric grooves, they are typically found in verses. “Bones” and “Ripcord” both extend this usage, with septuple and nonuple super-metric patterns (respectively) dominating much of the song. In the music of Tool, we find many more texted sections with irregular super-meter. Triple super-meter is the most common, but quintuple appears in texted sections of both “Stinkfist” and “The Patient.” Tool is also fond of instrumental sections with odd-cardinality super-meter, where the drumbeat rarely relies on the standard rock beat for long. Finally, Tori Amos avoids odd-cardinality super-meter in instrumental sections but uses such patterns freely in texted sections, where she shows a preference for cardinalities of five or more.

Because these observations all pertain to the work of a single artist or band, it is tempting to surmise that interactions between metric irregularity and form are largely idiosyncratic, and that no large-scale patterns exist. This issue is exacerbated by the disparate positions of my three core artists within the expansive generic fabric of rock. There may be some truth to this idea; however, when I return to formal considerations in Chapter 6, more robust claims emerge about the interconnectedness of musical time across all levels of hierarchy.

— 4 —

Common Irregular Grooves: Patterns of Five and Seven

Quintuple and septuple patterns are equally prevalent within the corpus and significantly more common than any other repeating irregular meter. A thorough exploration of the most common drumbeats in these meters is indispensable to our understanding of repeating irregularities more generally. The two cardinalities are especially instructive as models for irregular patterning insofar as each one bears a distinct relationship to regular metric archetypes and, therefore, reveals a characteristic approach to irregularity. Among quintuple patterns we find a multitude of different subdivisional possibilities expressed through a variety of drumbeats. The unpredictability of quintuple meters is a fitting foil to the ubiquity of the backbeat: where the latter embodies regularity in structure and usage, the former espouses irregularity. Septuple patterns, meanwhile, are strikingly consistent, demonstrating a strong reliance on the 4/4 model. While structurally irregular, the drumbeat patterns of septuple grooves are among the most predictable in the corpus. These broad trends notwithstanding, my examples demonstrate numerous innovative handlings of both cardinalities.

Quintuple Patterns

The quintuple grooves of the corpus are remarkable for their variety. I begin by outlining metric patterning (5/4), which is between three and four times more common than sub-metric (5/8). The most common patterns serve as a useful touchstone when analyzing more unique examples. Because of the high degree of variance encountered in these grooves, no single pattern emerges as a standard for the meter. Adding to this variance, I include within my discussion of 5/4 patterns a number of successions that could also be analyzed as 10/8 grooves (usually due to a pair of dotted-quarter-note durations at the start of the measure).¹ I conclude this section with a metric and hermeneutic analysis of Tool's "The Grudge." This vignette summarizes trends in quintuple patterns, showcases unique

¹ My decision to count these patterns alongside examples that express 5/4 unambiguously follows the same intuitive rationale that considers tresillo successions as a subset of 4/4 grooves.

grooves and relationships, and demonstrates the relevance of meter when interpreting musical-lyrical relationships.

METRIC-LEVEL QUINTUPLE TIME

The variety of drumbeats found in metric-level quintuple passages comes into sharpest relief through a comparison to the relative uniformity of 4/4 passages in the same repertoire. It is tempting to suggest that this discrepancy (in drumbeat variety) can be explained in part by the fact that fewer groups write songs in quintuple meter. That is, we might think that a band like Tool, known for their metric play, would consistently employ unconventional drumbeats regardless of regular or irregular metrical contexts. Since Tool have recorded more quintuple grooves than the average rock band, these would be proportionally better represented than their contributions in 4. However, this is not the case. Throughout the corpus we find a high degree of consistency in 4/4 time, meaning 5/4 grooves in a rock idiom are more susceptible to drumbeat variance than their 4/4 counterparts.² Specifically, whereas the expected snare placement within a measure of 4/4 is established (as the standard rock beat), the 5/4 passages I encountered suggest no comparably consistent rhythmic patterning. In thirty-three grooves across twenty-six songs, I found twenty-seven distinct patternings (summarized in **Tables 4.1** and **4.2**, below).

As a marker of metric continuation, snare articulations remain important in the analysis of quintuple grooves. In the absence of a single monolithic rhythmic paradigm, 5/4 passages rely on several less pervasive rhythmic schemas, in various combinations. Most often, these schemas divide the 5/4 measure into two parts; therefore, my analysis of each groove begins by addressing the following two questions:

1. Where is the first (metrically viable) snare articulation?
2. What does the snare do within beats four and five?

Each consideration yields three possible outcomes, some of which beget further variation. The first snare articulation is most commonly found on beat two; nearly as common is the second half of beat two; and beat three is significantly less common. Regarding the end of the measure, a snare articulation on beat five is most common; beat four is also well represented; and grooves with two

² Amos may be exceptional in this regard; her 4/4 drumbeats diverge more often from the standard backbeat than those of most artists. However, as her output contains relatively few quintuple grooves, a precise comparison of the two metric contexts is difficult.

The figure displays eight patterns of drumbeat succession, labeled A through H. Each pattern is shown with a schematic above a musical staff. The schematics use symbols: plus signs (+) for beats, asterisks (*) for non-isochronous beats, and open circles (o) for pulses. Braces {} group notes that are present in some but not all drumbeats of a type. Slashes (/) indicate beats where various rhythmic articulations occur across different examples. The musical staves are in 5/4 time, except for patterns G and H which are in 4/4 time.

Example 4.1: Eight patterns of succession found in 5/4 grooves of the corpus, with plausible metric interpretations.

snares marking beats four and five are in the minority. Returning our focus to the level of the measure, of the nine possible realizations of these six schemas, six are found in the songs of the corpus. This prompts a third, more general question, which encourages meaningful comparisons among the various possible quintuple patterns:

3. How does metric continuation emerge within the groove?

Example 4.1 presents simplified versions of eight types of drumbeats found in the corpus. These include the six combinations of snare articulations noted above (patterns A–F) as well as two undifferentiated patterns (patterns G and H). Brackets designate notes that are present in some drumbeats of a given type (but not all), while slashes denote beats in which various rhythmic articulations occur across different examples. Each drumbeat is annotated with the metric interpretation(s) it is most likely to evoke. My dot annotation is adapted from Osborn (2017) and retains his symbols for pulse (dot) and beat (open circle). I also follow Osborn's use of asterisks to characterize non-isochronous beat structures.³ I modify Osborn's approach by supplying annotations at the super-metric level, which I represent with a circled plus symbol regardless of isochrony; braces denote structures that are ambiguous or vague.

³ Osborn (2017, 60–61) notes the “metric-ish” quality of many such successions, which he calls Euclidean rhythms (following Toussaint 2005).

Most cases suggest a duple division of the measure (note the super-metric level in all but drumbeat D). In patterns with duple super-meter and an isochronous beat (i.e., drumbeats A, B, C, F, and G), one “super-beat” has a single continuation, while the other has either a double or deferred continuation. As we will see in the corpus, grooves in which the three-beat group precedes the two-beat one are nearly twice as common as the reverse.⁴ When non-isochronous beats form a duple super-meter (i.e., drumbeats E and H), the resulting structure is always (3,3)(2,2). There are two exceptions to the trend towards duple super-meter. The first is exemplified by drumbeat D, in which a first snare on the second half of beat two is followed by a snare on beat four. This succession results in a triple pattern (3,3,4)—a non-isochronous double continuation that spans the entire measure. The second can occur when drumbeat G (an isochronous, undifferentiated beat level) accompanies a slow harmonic rhythm. If the chords change once per measure, it is possible to perceive a single quintuple span.⁵

Table 4.1 provides a summary of the 5/4 passages I have analyzed, grouped according to snare schema. The prototypes given in **Example 4.1** can be mapped without much difficulty onto my shorthand transcriptions in the table’s third column. The drumbeat annotations are shortened to accommodate longer measure lengths, showing only the metric position of snare articulations unless otherwise noted. An asterisk (*) denotes a drumbeat with a prominent dotted rhythm. Closer inspection of some of the more unique examples demonstrates the impressive variety of drumbeats and metric structures available within a quintuple-meter framework.

Several of the listed examples contain slight variations of a stable drumbeat pattern. The first entry, Ben Folds’s “Bastard,” is unique for its two-measure drumbeat pattern that combines drumbeat A with a variant of drumbeat C. A more common development of the basic patterns involves the addition of snare ghost notes, which lack the syntactical weight of metric continuation. These can either anticipate a beat already marked by a stronger snare (as in Hail the Sun’s “Testostyrannosaurus”) or ornament such a beat with a sort of fast echo (as in Radiohead’s

⁴ This accords with Murphy’s (2017, [2.16]) assessment of a sample that overlaps substantially with my own. He analyzed 82% of his quintuple examples as trochaic (3,2) and 18% as iambic (2,3). The discrepancy between the trochaic-to-iambic ratio offered by Murphy (approximately 4:1) and my own (2:1) can be largely attributed to the fact that Murphy does not acknowledge non-duple divisions of 5/4 measures.

⁵ Note, however, that most listeners will naturally impose one of the two super-metric interpretations I have offered—even in the absence of a clear indication in the music that one or the other should be favoured. Hasty (1997, 141) asserts that, with a succession of five undifferentiated beats, “it will be very difficult (and at moderate tempi perhaps impossible) to suppress a feeling of duple or triple measure.” Large (2008) suggests that neural resonance explains the cognitive work through which we entrain to more regular meters, but he notes that “the relationship between complex (nonperiodic) musical rhythms, pulse, and meter remains a mystery” (222).

Drumbeat			Artist—Song (year)
First Snare	Beats 4 & 5	Shorthand Transcription	
		_ 2 _ 4 _ _ 2 3 _ _	Ben Folds—“Bastard” (2005)
Beat Four Only (Drumbeat A)		_ 2 _ 4 _	Tool—“The Grudge” (2001)
		_ 2 _ 4 _ + *	Tool—“Vicarious” (2006)
		_ 2 _ 4 _ a	TTNG—“Crocodile” (2008)
Beat Two	Both Beats Four & Five (Drumbeat B)	_ 2 _ 4 5	Alter Bridge—“Isolation” (2010)
		_ 2 _ 4 5	Soundgarden—“My Wave” (1994)
		_ 2 _ _ + 5	Hail the Sun—“Testostyrannosaurus” (2012)
Second Half of Beat Two	Beat Five Only (Drumbeat C)	_ 2 _ _ 5	Radiohead—“Sail to the Moon (Brush the Cobwebs out of the Sky)” (2003)
		_ 2 3 _ 5	Tool—“The Patient” (2001)
		_ 2 _ _ 5 (sample)	Vanessa Hudgens—“Last Night” (2008)
Beat Three	Beat Four Only (Drumbeat D)	_ _ + _ 4 _	Akeboshi—“Kamisama no shitauchi” (2005)
		_ _ + _ _	Dream Theater—“A Nightmare to Remember” (2009)
		_ _ + _ 4 _	Hozier—“From Eden” (2014)
		_ _ + _ (4+) _	Radiohead—“15 Step” (2007)
		_ 2 _ 4 _ †	Tool—“Hooker with a Penis” (1996)
Undifferentiated (Drumbeats G, H, etc.)		1 _ + _ 4 _ + (toms) *	Tool—“Rosetta Stoned” (2006)
	Beat Five Only (or variant; Drumbeat E)	_ _ + _ + _ 5	Muse—“Animals” (2012)
		_ _ + _ _ 5e+	Radiohead—“Morning Bell” (2000)
		_ _ + _ _ 5	Tool—“The Grudge” (2001)
Beat Three	Beat Five Only (Drumbeat F)	_ _ + _ _ 5	Tori Amos—“Hotel” (1998)
		_ _ 3 _ 5 (open hi-hats)	Akeboshi—“Wind” (2005)
		_ _ 3 _ 5	Dream Theater—“A Nightmare to Remember” (2009)
		_ _ + 3 _ + 5	Hail the Sun—“Testostyrannosaurus” (2012)
		_ _ 3 _ (+)_(_+)	Primus—“Here Come the Bastards” (1991)
		_ + _ 3 _ + _ *	Tool—“The Grudge” (2001)
		Kick (x5)	Hail the Sun—“Testostyrannosaurus” (2012)
		Snare (x5); Snare (x4): (3,3)(2,2)	Queen—“Innuendo” (1991)
		Kick (x5)	Radiohead—“Everything in its Right Place” (2000)
		Snare (x5) (sometimes omitting beat three)	Tool—“The Patient” (2001)
		Toms (x4): (3,3)(2,2)	Tool—“Lateralus” (2001)
		Kick – Snare (x4)	Tool—“ Rosetta Stoned” (2006)
		1 a_ + 3 a_ + 5 *	Tori Amos—“Rose Dover” (2014)

† In Tool’s “Hooker with a Penis” (1996), a snare on beat two is overridden by a crash on the “+” of that beat, which aligns better with the (3,3)(2,2) structure of the guitar and bass riff.

Table 4.1: List of repeating metric-level quintuple grooves in the corpus.

Drums

Swung, $d = 128$

(hats open)

(splash)

3

3

3

Example 4.2: Displaced snare articulations framing fifth-beat continuations in Primus's "Here Come the Bastards" (1991).

Example 4.3: Placement of three continuationals snares leading to ambiguity of grouping and hierarchy in Tool's "Vicarious" (2006).

“Morning Bell” and “15 Step”). In a short instrumental passage following the guitar solo in Primus’s “Here Come the Bastards,” the expected fifth-beat snare is absent for three measures (see **Ex. 4.2**). In the second and third of these measures, displaced snare articulations frame the absent stroke.⁶

A more extreme situation occurs in the verse groove of Tool's "Vicarious" (see [Ex. 4.3](#)). As my annotations below the staff show, in the first four beats of the measure the snare drum articulates two continuations, as in a standard rock beat.⁷ In this metric context, the fifth beat poses an interesting problem: the (rough) alternation of kick and snare that we associate with the backbeat continues, but its pace is accelerated. The kick drum activity in the fourth and fifth beats contradicts a hearing of the third snare as a delayed second continuation of beat three. Instead, I hear a metric structure of (2,2,1)—a truncated triple super-meter.⁸ The cymbals play an important role in simultaneously clarifying and destabilizing this groove. The dotted cross-rhythm in the open hi-hat (marked above the staff) serves to destabilize the quarter-note beat implied by the kick and snare. The single closed hi-hat provides an articulation of beat three through a familiar alternation with the syncopated kick drum, supporting the (2,2,1) structure.

⁶ Similar displacements occur in the floor tom and cymbals in other sections of the song, which is in 5/4 throughout.

⁷ The variation in the kick drum is fairly involved but by no means unusual for the genre.

⁸ I return to the idea of truncated patterns below in my discussion of septuple meters.

A **Swung**, $\text{♩} = 185$

(sample) (finger snap)

Drums

B

$\text{♩} = 109$

Drums

C

$\text{♩} = 176$

Drums

Example 4.4: Three 5/4 grooves with dotted cross-rhythms: (A) Vanessa Hudgens, “Last Night” (2008); (B) Tool, “Rosetta Stoned” (2006); (C) Akeboshi, “Wind” (2005).

Dotted-quarter-note rhythms are not uncommon, even outside of those marked primarily by the snare (i.e., drumbeats D, E, and H in **Ex. 4.1**). This is unsurprising when we consider the prevalence of tresillo successions in common time. In the less metrically stable context of 5/4 time, however, the resulting ambiguities can be striking. **Example 4.4** shows three such drumbeats. In Vanessa Hudgens’s “Last Night” (**Ex. 4.4A**), some listeners may feel that the dotted rhythm in the kick drum vies for metric primacy with the snare substitute (a heavily processed cymbal sample). If the kick pattern is privileged, the meter is (3,3)(2,2) or (3,3,4) at the eighth-note level; if we attend to the sample, it is (3,2) in quarter notes. I prefer the latter hearing not only because of my prioritization of snare articulations, but also because the consistent quarter-note beat feels more comfortable than a varying pulse length at the song’s quick tempo (quarter = 185). In the second groove, from Tool’s “Rosetta Stoned” (**Ex. 4.4B**), the dotted rhythm in the kick supports the same pattern in the toms. The most likely metric interpretation here is (3,3,4) but, because the dotted pattern carries through beats four and five, and because of the re-articulation on the second half of beat five, it may be possible for a radical listener to hear (3,3)(3,1). Finally, Akeboshi’s “Wind” (**Ex. 4.4C**) presents a case in which the phrasing and harmonic rhythm are clear enough that the drumbeat can invert the roles typically ascribed to the hi-hats and snare without destabilizing our hearing of a familiar

$\text{♩} = 52$

Voice You don't have to throw it all away

Drums

Example 4.5: A unique metric structure in Amos's "Rose Dover" (2014).

pattern. The dotted rhythm marked in the snare is easily interpreted as a cross-rhythm rather than the primary metric cue, due in part to the fact that the articulations are all rim knocks—dynamically softer and timbrally less assertive than a standard snare stroke. In the absence of a normative snare line, the hi-hats on beats two, three, and five cue metric continuation in a (3,2) pattern. The absence of the hi-hats from beats one and four results in an alternation with the kick drums on those beats, supporting the notion that the hi-hats take on the snare's function.

One further example summarizes some of the trends observed in 5/4 grooves while demonstrating a unique drumbeat and metric situation. Two factors complicate metric interpretation in Tori Amos's "Rose Dover": (1) the simplicity of the drumbeat, which involves only the snare drum, and (2) the unusually slow tempo of the chorus, in which the 5/4 passages are found (see **Ex. 4.5**). The tempo is clarified by contextual cues: the arrangement employs two alternating textures, the thinner of which corresponds with a half-time tactus. Thus, in the metrically irregular chorus, the thin texture and absence of double-time metric cues encourages retention of the half-time feel. More complex is the interaction of drumbeat, harmonic rhythm, and vocal delivery. In isolation, the snare part articulates a repeated tresillo followed by a single four-count (3,3,2)(3,3,2)(4); every pulse is present, as either a ghost note or one of the accented strokes in the pattern. This accent pattern suggests a (2,2,1) parsing of the 5/4 meter, a structure that is supported by the harmonic rhythm (articulated most clearly in the synth part). In the vocals, however, beat four may be interpreted as metrically strong. The phrase "you don't have to throw it all away" has occurred several times already in the song, always aligning "throw" with a downbeat. The displacement of this vocal idea, supported by a rhythmically consonant $\hat{2}-\hat{7}-\hat{1}$ gesture, suggests a more familiar (3,2) metric structure, conflicting with the (2,2,1) outlined in the drums and synth. Although several familiar

	Drumbeat	Artist—Song (year)
(3,2)	Kick – (Kick) – Snare (possibly triple or subdivided?)	Dream Theater—“A Nightmare to Remember” (2009)
	Snare – Snare (undifferentiated; substantial syncopation in kick)	Soul Asylum—“Misery” (1995)
(2,2,1)	Kick – (. . .) – Snare	Tool—“The Patient” (2001)

Table 4.2: List of double-continuation metric quintuple grooves with weakly articulated first continuation in the corpus.

elements (tresillo succession, (2,2,1) subdivision, and a general preference for Platonic-trochaic structures) are found in this drumbeat, the passage is ultimately best described as metrically underdetermined.

Before proceeding on to 5/8 grooves, one final possibility occurring in 5/4 contexts merits some discussion. In Chapter 3 I drew attention to the complications that arise in double-continuation drumbeat patterns when the first continuation is not articulated by the snare.⁹ Specifically, without a clear cue early in the measure as to the metric structure, double and deferred continuations admit substantial ambiguity and can result in grooves that feel awkward. Analogous situations occur in a small number of 5/4 passages (see **Table 4.2**); because of their idiosyncrasies, I treat these as separate from the more representative 5/4 examples. Whereas the drumbeats collected in **Table 4.1** all contain a strong snare in the second quarter of the measure (on or between beats two and/or three), the three examples considered presently lack such a snare. Instead, the arrival of the first continuational snare is reserved until beat four or later.

Two of the three examples in question suggest a duple division of the 5/4 measure with a snare continuation on beat four. The resulting (3,2) structure draws the ear to the super-metric level, where the asymmetrical division of the measure precludes a consistent pulse. In an extended guitar solo in Dream Theater’s “A Nightmare to Remember,” the alternation of kick and snare in articulating this structure encourages a half-time interpretation of the groove (see **Ex. 4.6A**). The passage in question reprises (and expands upon) an earlier guitar solo, which employs a variant of Drumbeat F above (see **Ex. 4.6B** and cf. **Ex. 4.1F**). Comparison of the two drumbeats bolsters the half-time reading of the later passage and reinforces the importance of attending to the subtleties of snare placement within irregular grooves.¹⁰

⁹ Refer back to **Exx. 3.1D** and **3.10**, regarding the tresillo and triple-meter, respectively

¹⁰ The modest discrepancy in tempo between the two excerpts exacerbates the distinction in feel. The half-time groove starts slower, emphasizing the less assertive character of the drumbeat (though, as the later solo builds in intensity, the tempo accelerates and eventually exceeds the consistent pace of the earlier solo). A closely related drumbeat spans two

A $\text{♩} = 155$
 (open throughout)

B $\text{♩} = 170$

Drums

Example 4.6: Two quintuple-meter grooves in Dream Theater's "A Nightmare to Remember" (2009): (A) a half-time drumbeat (begins ca. 8:36); (B) a more normative drumbeat accompanying the same guitar riff (begins ca. 2:43).

$\text{♩} = 109$

Drums

Example 4.7: Deferred second continuation in quintuple meter in Tool's "The Patient" (2001).

A related but different situation arises in Tool's "The Patient"; the snare is further delayed until beat five, most often in a (2,2,1) pattern. **Example 4.7** gives the first two measures of the song's first verse. The drumbeat transcribed here is repeated twice, with some variation (the snare marked in the second measure is absent only the first time), and then yields to an abridged pattern based on repetitions of the first measure only. Among the three examples with late first-snare articulation, "The Patient" is the most ambiguous: it is unclear whether the further delay of the snare encourages or forestalls a half-time interpretation. On the one hand, it is possible to hear a variant of 3/2 time in which the final quarter note of each measure is deleted, thus halving the length of each third beat. On the other hand, the (2,2,1) beat structure of the passage is familiar from Drumbeat F (**Ex. 4.1**) and several previous examples. Impeding this reading is the absence of a snare on beat three—an absence which to my ear precludes the possibility of hearing that beat as a continuation at the quarter-note level (i.e., (3,2)). In either case, the groove from "The Patient" is the only example of this drumbeat pattern, and the only groove in the entire corpus that relates to one of the previous 5/4 archetypes but lacks a snare in the first three beats.

measures at a time in Soul Asylum's "Misery." The chief distinction between this example and the half-time groove of "A Nightmare to Remember" is the presence of a snare on beat one: the early snare produces an undifferentiated relationship between beats one and four, eschewing the half-time feel. Hesselink (2016) regards the 4/4 analogue of this beat (Snare – Kick – Snare – Kick) as a timbral variant of the standard rock beat, and not as a half-time groove.

SUB-METRIC QUINTUPLE TIME

Because a measure of 5/8 is only half as long as one of 5/4, and because the corpus offers fewer examples of the former meter, the disparities among sub-metric quintuple examples are less marked than those at the metric level. Nevertheless, grooves in 5/8 time exhibit a healthy amount of drumbeat variance (see **Table 4.3**). Unlike the 5/4 grooves just surveyed, only two drumbeats are prevalent enough to function as plausible default options for 5/8 meter; several of the grooves surveyed here are entirely unique, including patterns that span multiple measures. Within these various approaches, the role of the snare drum in articulating metric continuation remains important as ever, as does the trope of kick-snare alternation.

The most common drumbeat in 5/8 passages, characterizing three of the nine analyzed grooves, consists of a dotted-quarter-note kick followed by a quarter-note snare. The prevalence of this pattern is to be expected: it both follows familiar drumbeat practices and articulates a Platonic-trochaic grouping of eighth-note pulses. One related example (in Hail the Sun’s “Testostyrannosaurus”) subdivides the (3,2) succession as (3,3)(2,2) at the sixteenth-note level. The second most common drumbeat pattern is the retrograde of the first (i.e., an “iambic” (2,3)). Three different articulations of this succession are found in three different songs; one of these (ITNG’s “26 is Dancier than 4”) further subdivides the three-eighth span, resulting in a triple division of the measure (4,3,3). For the most part, all of these 5/8 patterns exhibit only the most familiar drumbeat elements from 5/4 and regular metric contexts. One modest exception occurs in the verse groove of Sting’s “Seven Days” (see **Ex. 4.8**). While the kick and snare alternate in a familiar (3,2) pattern, the hi-hats keep a steady quarter-note pulse, drifting in and out of sync with the 5/8 meter and establishing a G5/2 grouping dissonance.¹¹ I hear the kick-snare alternation as the principal metric cue in this drumbeat, but some listeners may prefer to hear a 5/4 meter, favouring the hi-hat as the beat and interpreting every second kick as anticipating beat four in a (3,3)(2,2) structure. According to drummer Vinnie Colaiuta, the ambiguity of the drumbeat was intentional: “Sting wanted it to be that way” in order to afford audience entrainment to a familiar quarter-note beat.¹²

¹¹ My labeling of grouping dissonances follows Krebs (1999).

¹² See Kev O’Shea, “Vinnie Colaiuta explains Sting’s ‘Seven Days,’” *YouTube*, October 25, 2016, <https://www.youtube.com/watch?v=GwmCeon6aPo>, accessed September 1, 2018.

	Drumbeat	Artist—Song (year)
3+2 Patterns	Kick – Snare	Sting—“Seven Days” (1993)
	Kick – Snare	Tool—“Swamp Song” (1993)
	Kick – Snare	Tool—“The Patient” (2001)
2+3 Patterns	Snare (x4): subdivided (3,3)(2,2)	Hail the Sun—“Testostyrannosaurus” (2012)
	Kick – Snare – Snare (4,3,3)	TTNG—“26 is Dancier than 4” (2008)
	Undifferentiated Snare (x2)	Tool—“The Patient” (2001)
Other	Kick – Snare	Tool—“Rosetta Stoned” (2006)
	Stable guitar ostinato; variable drumbeat	Dave Matthews Band—“Seven” (2009)
	5-mm. pattern (see Ex. 3.31)	TTNG—“Rabbit” (2008)

Table 4.3: List of repeating sub-metric quintuple grooves in the corpus.

$\text{♪} = 184$

Drums

Example 4.8: Grouping dissonance between the kick-snare pattern and the steady hi-hat in Sting’s “Seven Days” (1993).

Although most 5/8 grooves follow relatively predictable patterns, the two examples under the heading “Other” are entirely unique. In “Seven,” by Dave Matthews Band, a shift to 5/8 is clarified by a repeated eighth note on the downbeat of each new measure (see Ex. 4.9). This rhythmic motive begins, largely unaccompanied, in the guitar. The drumbeat soon enters with a two-measure pattern, initiated by the same double eighth note in the kick.¹³ While this recurring rhythm makes the boundaries of each measure unambiguous, the metric structure *within* each measure remains unclear. As the guitar establishes the vamp, it emphasizes a familiar Platonic-trochaic (3,2) structure. The placement of snare drum articulations in the drumbeat, however, is difficult to reconcile with this structure. The snare sounds on the second half of beat four in the first of every pair of measures and on beat five in the second. The placement of these articulations is disorienting from a metric standpoint because, while only one snare is present in each measure, no snare falls near enough to the centre of the measure to evoke a clear duple subdivision.¹⁴ A dotted rhythm in the kick drum in every second measure further contributes to the highly syncopated drum part of “Seven,” suggesting

¹³ The song also relies heavily on a 7/8 groove, with the same two eighth notes in the kick on beat one.

¹⁴ The omission of the second snare in a 5/4 groove in Dream Theater’s “A Nightmare to Remember” results in a somewhat similar situation (see Table 4.1 under the “Second Half of Beat Two” category for first snare placement). In that instance, the early appearance of the snare within an otherwise familiar drumbeat pattern, coupled with a highly regular kick-drum part, precludes the sort of ambiguity we find in “Seven.”

$\text{♪} = 188$

w/delay

Electric guitar

Drums

splash

43 vox enter 4

(etc.)

Example 4.9: A partially underdetermined drumbeat over a metrically irregular guitar ostinato in Dave Matthews Band's "Seven" (2009).

$\text{♪} = 226$

(2nd crash)

Drums

3

repeated and varied for extended outro vamp

Example 4.10: A repeating five-measure drumbeat pattern in TTNG's "Rabbit" (2008).

that the guitar may be the only metrically stable element in the groove (cf. earlier examples of virtuosic drum work over static guitar parts). The present example thus straddles the line between regular drumbeat and drum solo through the irregular displacement of the snare within a repeating pattern.

The outro vamp of TTNG's "Rabbit" also organizes 5/8 time in a distinctive way (see **Ex. 4.10**). The quintuple organization at the pulse level is reiterated at the level of the measure, resulting in a twenty-five-pulse pattern. As in "Seven," the drums in this irregular groove unite elements of regularity with modest soloistic variation. The kick drum marks every pulse (transcribed as eighth notes), and each measure begins with a cymbal stroke on crash, splash, or ride. The snare usually articulates the downbeat of the second measure and often that of the fourth, though the latter is not present in the first five measures (the passage transcribed). Given the quick tempo of the kick pulse (it is among the faster 5/8 examples) and the sparseness of snare articulations in this groove, it could be argued that this example is better understood as a slow quintuple time (5/4 or even 5/2) with a

quintuplet subdivision. This analysis has the benefit of placing the first snare on “beat two”—a more familiar rhythmic situation. Yet I prefer a 5/8 interpretation because it accommodates the repeating chord progression in a more intuitive way, with one chord per measure. A reading of quintuplet subdivisions would place the full five-chord loop within a single measure—quite strange in a rock context. Regardless of the time signature attributed to this passage, a striking metric structure results from the nesting of quintuple division at two adjacent hierarchical levels.

ANALYTICAL VIGNETTE: QUINTUPLE-BASED GROOVES IN “THE GRUDGE”

The opening track of Tool’s *Lateralus* (2001) depicts the persistence of a grudge in the mind of an unnamed character. Consisting almost entirely of quintuple-based grooves, the song’s different drumbeats demonstrate the sheer variety of quintuple patterns available to rock musicians. My analysis of “The Grudge” combines observations about metric structure (highlighting the interplay of Platonic-trochaic and Platonic-iambic successions) with a hermeneutic reading based on the interaction of lyrics and metric cues. Patterns with the prevalent (3,2) structure become associated with the idea of the grudge, while alternative metric structures—most notable among them the (2,3) reversal of the prevailing pattern—represent the character’s unsuccessful attempts to question, resolve, or renounce the grudge.¹⁵ **Example 4.11** presents the most distinct quintuple drumbeats of the song as they first appear (most undergo modest variation or return more than once).

The first groove establishes the (3,2) structure at the sixteenth-note level in all instruments (guitar, bass, and drums). The quick tempo of the metric irregularity and the Phrygian neighbour-note figure create an uneasy, aggressive topical field.¹⁶ I refer to the resulting five-sixteenth, four-note figure as the Grudge motive. This motive is easily mapped onto the idea of a grudge—unpleasant for the holder and relentless while held. The first minute of the song bears out this interpretation through an instrumental introduction comprising variations on the motive. The same pattern continues in the guitar and bass under the vocal entry (beginning at 1:00). I hear a shift to

¹⁵ If told from this perspective, to which I adhere below, the resulting narrative is what Almén (2008, 66), following Northrop Frye, might call an Ironic narrative: “the *defeat of an order-imposing hierarchy* [here, the protagonist] by a transgression [the grudge].” It is also possible to view the grudge itself as the primary actor in the narrative, given the prominence of the grudge’s representation in the song. However, the corresponding narrative archetype of Romance “the *victory of an order-imposing hierarchy* [i.e., the grudge]” seems a strange fit to this human listener. (All italics in original.)

¹⁶ A topic-oriented approach holds much promise in the analysis of progressive rock genres like alternative metal, and such an approach figures modestly in this analysis. Work that employs topic theory in analyzing popular music includes Spicer (2010), Leydon (2010), and Echard (2017). My handling of musical topics is also indebted to Hatten (1994) and Almén (2008), among others.

[INTRO - 0:07]

$\text{♩} = 389$ (i.e., $\text{♩.} = 130$ and $\text{♪} = 195$)
(with delay)

Electric guitar (medium distortion)

Bass

Drums

[INTRO - 0:19]

[CHORUS - 1:00]

$\text{♩} = 97$ ($\text{♩} = \text{♪}$)

Wear the grudge like a crown of ne - ga - ti - ty

Electronic drums (roto toms) (finger cymbals?)

VAMP - 1:19; drums enter at 1:26

(processed sample)

VERSE - 1:45 & 2:40

Clutch it like a cor - ner stone O - ther - wise it all comes_ down
(medium distortion)

Acoustic kit (splash)

Example 4.11: Incipits of each distinct quintuple drumbeat lasting two or more measures in Tool's "The Grudge" (2001), given with full-band context and timestamps, ordered as they appear in the track.

CHORUS VAMP - 3:17

D⁵

(doubled by bass on low D)

CHORUS - 3:29

D⁵

Wear the grudge like a crown of ne - ga - ti - vi - ty
(doubled by bass 8vb)

POST-CHORUS - 3:40

Wear the grudge like a crown Des-per- ate to con trol
(doubled by bass 8vb)

BRIDGE - 3:52

de - fin - ing
C⁵
(doubled by bass 8vb)

INSTRUMENTAL BREAK - 4:13

D⁵ F⁵ G⁵
(doubled by bass 8vb)

CHORUS - 4:25

Sa - turn comes back a-round to show you ev' - ry-thing lets you choose what you will will not see and then
(guitar and bass as at 3:29)

Example 4.11: Tool's "The Grudge" (2001), continued.

The musical score consists of six staves of music:

- INSTRUMENTAL BREAK - 5:48**: (guitar holds D5 for measure) Bass and guitar parts.
- ADMONITION VAMP - 7:24**: **Tempo I** ($\text{♩} = \text{♪}$) (guitar plays sixteenths) Bass and guitar parts.
- ADMONITION - 7:36**: (guitar plays sixteenths) Bass and guitar parts. Includes lyrics: let go let go let go let go.
- HEAVY OUTRO - 8:00**: (guitar doubles 15va with power chords) (guitar 8va) Bass and guitar parts. Includes (2nd crash).
- HEAVY OUTRO - 8:12**: (guitar doubles 8va with power chords) Bass and guitar parts.
- HEAVY OUTRO - 8:25 to END**: D5 (bass continues previous riff) Bass and guitar parts.

Example 4.11: Tool’s “The Grudge” (2001), continued.

5/4 time for this initial chorus, in which the singer’s rhythm overrides the repeating Grudge motive due to the absence of a clear snare pattern. While the lyrics begin in sync with the irregular pattern, the emphasis of the word “crown” on beat three encourages the listener to hear syncopation against a quarter-note beat. This beat is stabilized by the clear eighth notes of beats four and five. Like the sixteenths of Grudge, the quarter notes of this new rhythm follow a (3,2) structure. I call this larger rhythmic idea the chorus Tattoo, as it is a mainstay of many important grooves as the song progresses. Tattoo represents an intensification of the narrative thus far, continuing the exposition of the song’s central theme in three ways: (1) Tattoo carries forward the (3,2) metric structure of

Grudge, (2) Grudge is embedded into the rhythmic fabric of Tattoo, and (3) the chorus lyrics refer explicitly to the effects of the grudge on the presumed protagonist:

Wear the grudge like a crown of negativity.

Calculate what we will or will not tolerate.

Desperate to control all and everything.

Unable to forgive your scarlet letterman.

After a brief transition, Tattoo re-enters and persists through two-and-a-half minutes of music and numerous changes of groove, each expressing the same (3,2) structure associated with the grudge. The rhythmic motive arrives in the drums at 1:26 in the midst of an instrumental vamp; it migrates to the guitar through two verses, while the drums play a familiar (3,3)(2,2) pattern; a new vamp brings Tattoo back to the musical foreground at 3:17; and the lyrics return soon after on the same figure with a repeat of the chorus. This second chorus brings with it a heavier arrangement in which the drums support the vocals in articulating the crucial Tattoo motive. Throughout the first half of “The Grudge,” a variety of (3,2) metric patterns underpin the related Grudge and Tattoo motives. I interpret the variety of these grooves to represent the grudge invading every aspect of the character’s life. The consistency of metric structure and the relentless rhythmic motives signify the stubborn nature of the grudge itself.

The song’s bridge (beginning at 3:52) supplies the first quintuple groove without a (3,2) structure. The drumbeat is similar to that of “Vicarious” (cf. **Ex. 4.3**), most importantly in its (2,2,1) subdivision of the measure.¹⁷ The kick-snare alternation of the first four beats immediately recalls the standard rock beat. Shifting to a moderate-tempo, backbeat groove for the bridge is a common strategy in progressive rock and alternative metal genres and is usually associated with a feeling of confidence and control. The attendant topic might appropriately be called *Pocket*, after the concept in popular music performance.¹⁸ While the bridge of “The Grudge” certainly evokes the topic of *Pocket*, the fifth beat of each bar undermines the feeling of comfort typically expected in such a groove.¹⁹ The lyrics of the bridge aid in understanding the clash of topic and quintuple meter:

¹⁷ The absence of a snare within the beat-five span makes it easier to hear the groove from “The Grudge” as a (2,3) structure. I prefer the (2,2,1) interpretation both because it reflects a practice more common in the band’s output (see both “Vicarious” and “The Patient,” **Ex. 4.7**) and for the analogy to 4/4 time that it encourages (see below).

¹⁸ *Pocket* connotes a confident, controlled, and comfortable state of performance microtiming. A description of a player as being “in the pocket” is a positive appraisal of their performance.

¹⁹ Every third measure in this section is extended to 7/4, a detail omitted from my analysis in order to foreground the (dominant) quintuple aspects of the song.

Defining / Confining / Sinking deeper

Controlling / Defining / We're sinking deeper

The shift in narrative style away from a fuller articulation of ideas via second-person address, usually involving a subject-predicate pair, to these fragmented present participles suggests a change in speaker (or in the speaker's state of mind), and the new metric structure reinforces this change. I hear this new speaker as the grudge itself, admitting its intention to define and control the protagonist. The use of the first-person plural is significant in this reading—the grudge seeks only to harm its holder without regard for itself. The *Pocket* topic conveys the confident, controlling voice of the grudge, while the discomfort of a non-4/4 version of this topic depicts not only its disturbing character, but also the struggle between the grudge and its holder.

The narrative shift in the bridge prompts further instability in the meter of "The Grudge"—the following instrumental break is one of the most complex subdivisions of 5/4 in the song. At the highest (quarter-note) level, the measure is divided as (2,3), reversing the structure associated with both Grudge and Tattoo. If we attend to the grouping of sixteenth notes, the prevalence of dotted-eighth-note durations comes to the fore: the guitar and bass offer a (3,3,2)(3,3)(3,3) succession, the opening tresillo of which syncopates against its retrograde in the drumbeat (2,3,3)(3,3)(3,3).²⁰ This conflict signifies an outburst from our protagonist, who recognizes the negative effects of the grudge they hold. The reversal of the (3,2) grudge structure conveys the character's will to overcome the grudge. The rhythmic dissonance between guitars and drums might represent an internal conflict, or the difficulty of letting go. Appropriately, when the vocals return with new lyrics over the previous chorus groove, the drums again support the Tattoo rhythm: the grudge remains unshaken.

The next new drumbeat (5:48) contrasts with the earlier (4:13) instrumental.²¹ Structurally, the (3,3)(3,3)(3,3,2) succession of the new drumbeat is the retrograde of the earlier groove. A striking local detail is the near-exact reversal of the drum articulations from the opening tresillo (see **Ex. 4.12**). By beginning with the repeated dotted rhythm, the new near-retrograde structure obscures the underlying quarter-note beat more than the earlier instrumental. The beat level of the new groove is modeled better as (3,2) than (2,3) but neither option is entirely convincing; recourse to the sixteenth-

²⁰ The Platonic-iambic organization of this extended succession is especially striking.

²¹ The intervening material includes variations of some of the drumbeats already presented. Most interesting from our hermeneutic perspective is the lyric "choose to let this go," which is accompanied by sparser drum activity. The eventual addition of **GRUDGE** in the hi-hats, and the subsequent, more assertive entry of a familiar (3,3)(2,2) groove suggest that the protagonist remains unable to heed the narrator's advice.

Example 4.12: Two instrumental passages with a near-retrograde relationship in Tool’s “The Grudge” (2001).

note pulse is necessary to accommodate the most salient metric potential. This underdetermined metric situation depicts a narrative stasis in which we are unsure whether or not the grudge is still held. Adding to the uncertainty, this passage is followed by a related groove with guitar and bass articulating a (3,3)(2,2)—associated with the grudge—against which the lyrics address the protagonist directly with advice to abandon the grudge:

Give away the stone / Let the ocean take and
 Trans-mutate this cold and faded anchor
 Give away the stone / Let the waters kiss and
 Trans-mutate these leaden grudges into gold

This texted section is undermined by the return of intro material, emphasizing the continued presence of Grudge. The divergence of the musical content from the advice of the narrator suggests a rising conflict; it is unclear whether this is internalized by the protagonist or merely a reflection of the narrator’s frustration—perhaps the narrator and protagonist are one and the same and the lyrics represent their internal dialogue. The conflict comes to a head when (at 7:24) the drums and bass lock into a clear (2,3) pattern at the sixteenth-note level. This is the first occurrence of this pattern, reversing the metric identity of Grudge. I call the new motive Admonition after the repeated lyrics “let go” that soon enter to the same (2,3) sixteenth-note rhythm. This passage is the clearest expression of a struggle against the grudge, both musically and lyrically, and the use of the less common iambic quintuple succession ascribes a sense of discomfort to the idea of letting go. In fact, it may be more comfortable for some listeners to interpret the quick, undifferentiated iambs of Admonition instead as quintuplet subdivisions of a 4/4 meter (though, the change in tactus required to hear this would be unique in this song). After the vocal part fades in, however, an electronic drum articulates every quarter-note beat against the repeating five-eighth-note pattern. This simultaneously clarifies the meter through a shift to 5/4, while intensifying the feeling of conflict associated with this groove through the addition of an uncommon G5/4 grouping dissonance.

As is often the case in Tool's work, the song concludes with a virtuosic instrumental outro culminating in a final sublimation into an important irregular rhythmic-metric motive. In the final seconds of "The Grudge," the overwhelming evidence is that, despite the narrator's petition, the grudge overpowers its host and reasserts control one last time. A variant of Tattoo (8:00) reinstates a (3,2) structure at the quarter-note level and Grudge soon returns in the bass and guitar (8:12) against a new drum pattern suggesting (3,3,4) in sixteenths. If a listener folds this new pattern into a (3,2) eighth-note structure, this moment represents the grudge's final conquest, asserting the same metric subdivision in quarters, eighths, and sixteenths. The drums mount one last, desperate attempt to establish a (2,3) eighth-note subdivision (8:25)—articulated by the snare drum, no less, which has been absent from many of the song's undifferentiated drumbeats—but the effort is short-lived, ceding to the continuing Grudge motive. The protracted struggle is ultimately futile; the grudge is insurmountable.

"The Grudge" exemplifies all of the most important observations made about quintuple patterns. First and foremost, the song is a microcosm of the variety encountered throughout quintuple examples. "The Grudge" employs patterns of five at three different hierarchical levels and is the only song in the corpus with sixteenth-note quintuple patterning. Moreover, variety is expressed both in the structure of grooves and in their specific articulations. Regarding the former, the song's 5/4 drumbeats include at least three of those given in **Ex. 4.1** (A, E, and G are clear; B and F are also possible), in addition to a half-time variant and numerous subdivisional possibilities not encountered elsewhere in the corpus. These are supplemented by Platonic-trochaic and Platonic-iambic 5/16 grooves, a (3,3,4) 5/8 subdivision, and several cross-rhythms. Regarding the articulation of these structures, consider the subtly varied presentations of Grudge and Tattoo over the course of the song. Second, my analysis of "The Grudge" demonstrates that the prevalence of a metric pattern can itself suggest musical meaning. Specifically, the more common Platonic-trochaic structures—most notably (3,2) divisions at different hierarchical levels—align with the song's central theme, the grudge itself. Various uncommon patterns denote discomfort or confrontation, including the iambic (2,3), which is reserved for moments of struggle against the grudge.

Septuple Patterns

Among septuple patterns, metric and sub-metric grooves occur with approximately the same frequency (I found twenty-one of the former and nineteen of the latter, as well as a single case of

7/16). This contrasts with the disparity in numbers between 5/4 and 5/8 examples. The drumbeats of both septuple collections clearly exhibit paradigmatic norms—again in sharp contrast to the quintuple patterns just discussed. Both models reveal an affinity among drummers for common regular meters: the most common 7/8 drumbeat archetype is closely related to the standard rock beat, while its 7/4 analogue resembles a measure of 4/4 followed by one of 3/4. I begin by surveying examples of 7/8 time, as they are the more consistent collection. I often draw attention to the ways in which septuple patterns can complicate metric well-formedness, recalling points made in Chapter 1, and conclude with a brief theoretical reflection on this topic.

SUB-METRIC SEPTUPLE TIME

Both the higher prevalence of sub-metric examples in the septuple sphere and the relative consistency of their drumbeats can be attributed to the similarity of many 7/8 grooves to the standard (4/4) rock beat. As shown in **Table 4.4**, the vast majority of 7/8 drumbeats demonstrate the same alternation of kick and snare that we expect from a 4/4 backbeat. (Note the addition in this table of open squares [□], representing kick-drum articulations; these aid in differentiating among drumbeats with the same pattern of snare articulation.) Because of the close relationship between the standard backbeat and most 7/8 grooves, many examples from **Table 4.4** can be profitably understood in 3.5/4 time—that is, as comprising measures of 4/4 omitting the final eighth note.²² For the purposes of this discussion, I continue to use terminology appropriate for seven-beat measures. Translation between the two schemas is simple enough: references to “beat three” and “beat seven” in what follows can be understood not only according to their eighth-note position but also as the second and fourth quarter-note positions in a measure (cf. beats two and four in a 4/4 measure).

While most 7/8 grooves follow the backbeat model in the first two beats of the measure, the second half of the measure allows substantially more varied approaches.²³ The most common strategy continues the imitation of the 4/4 beat throughout the measure, culminating in the deletion of the final eighth note. Drumbeats in this category often complicate matters with a sixteenth-note

²² The resulting structure recalls Lerdahl and Jackendoff's (1983, 101) notion of metric deletion, with the caveat that in its original conception the idea is applied only at hypermetric levels. This imperfect comparison is suggestive of the issues for metric structure posed by many septuple meters.

²³ Local variants like the double snare articulations on beats three and four in Tool's “Forty Six & 2” do not destabilize the underlying structure.

	Drumbeat	Artist—Song (year)	
Begins as 4/4 Standard Rock Backbeat (Kick – Snare)	Kick on Beat Five	$\square \underline{3} \underline{\square} \underline{7}$ $\square \underline{3} \underline{\square} \underline{7}$	Animal Collective—“What Would I Want? Sky” (2009) Dream Theater—“Scene Six: Home” (1999)
	Backbeat Continues: 2 nd Snare on beat Seven	$\square \underline{\square} 3 \underline{\square} \underline{\square} 7$ (kick varied)	Dream Theater—“A Nightmare to Remember” (2009)
		$\square \square 3 \underline{\square} \underline{\square} 7$	Moe—“Wind it Up” (2007)
		$\square \underline{\square} 3 \square \underline{\square} \square 7$	Sting—“St. Augustine in Hell” (1993)
		$\square \underline{3} 4 \underline{\square} \underline{\square} 7$ (and variations)	Tool—“Forty Six & 2” (1996)
		$\square \underline{\square} 3 \square \underline{\square} \square 7$	Tool—“Ticks & Leeches” (2001)
	No late kick	$\square \square 3 \underline{\square} \underline{\square} 7$	The National—“Demons” (2013)
		$\square \square 3 \underline{\square} \underline{\square} 7$	Sting—“Like a Beautiful Smile” (2003)
	2/4 + 6/16: 2 nd	$\square \square 3 \underline{\square} \square \square + \underline{\square}$	Alice in Chains—“Them Bones” (1992)
	Snare on the “+” of Beat Six	$\square \underline{3} \underline{\square} \underline{\square} + \underline{\square}$	Red Hot Chilli Peppers—“Ethiopia” (2011)
Other	Snare on Beat Six	$\square \square \square 3 + \underline{\square} \underline{\square} 6 \underline{\square}$	Slint—“Breadcrumb Trail” (1991)
	No 2 nd Snare	$\square \square 3 \underline{\square} \underline{\square} \underline{\square}$	Radiohead—“Paranoid Android” (1997)
		$\square \underline{3} \underline{\square} \underline{\square} \underline{\square} \square$	Ben Folds—“Bastard” (2005)
		$\square \underline{3} \underline{\square} \underline{\square} \underline{\square} \square$	Dave Matthews Band—“Seven” (2009)
Undifferentiated	Electronic percussion (x7)	$\square \underline{3} \underline{\square} \underline{\square} \underline{\square} 7 $	Seal—“Dreaming in Metaphors” (1994)
		$\square \underline{\square} 4 \underline{\square} 6 7$	Radiohead—“2+2=5 (The Lukewarm)” (2003)
		$\square \underline{\underline{\square}} 4 \underline{\underline{\square}}$	Ben Folds—“Bastard” (2005)
	Other/Unique		Tori Amos—“Barons of Suburbia” (2005)

Table 4.4: List of repeating sub-metric septuple grooves in the corpus.

anticipation of the fifth eighth note in the kick drum—indeed, this is more than twice as common as the solid but potentially square placement of a kick on beat five.²⁴ The use of an anacrusis to the fifth eighth-note, like many 7/8 conventions, has clear backbeat antecedents. **Example 4.13** compares the drumbeats of Stone Temple Pilots’s “Interstate Love Song” (in 4/4) and Sting’s “St. Augustine in Hell” (in 7/8). The structural features relating the two drumbeats are found in an alternation of kick and snare, articulating every quarter note save the third, which is anticipated by a sixteenth note. While this comparison offers a framework for understanding the structure in question, it risks oversimplification. In the septuple context, the kick-drum syncopation carries more metric potential than it does within a backbeat variant: because each anacrusic mid-measure kick drum occupies a rhythmic position that exactly bisects the measure, some listeners might be drawn

²⁴ One further possibility is the omission of any kick-drum articulation from the second half of the measure, as in Sting’s “Like a Beautiful Smile” and in The National’s “Demons.” In both of these songs, the floor tom stands in for the kick drum, supplying an anacrusis to beat five.

Drums

A

$\text{♩} = 84$

B

$\text{♩} = 168$

(ride quarters continue . . .)

The image shows two sets of drum notation. Set A, labeled 'A', is for a 4/4 groove at a tempo of 84 BPM. It features a kick-drum anacrusis consisting of two eighth-note strokes followed by a dotted eighth-note stroke. The first two eighth-note strokes are marked with 'x' and the third with a circled dot. Set B, labeled 'B', is for a 7/8 groove at 168 BPM. It also features a kick-drum anacrusis, with the first two eighth-note strokes marked with 'x'. A yellow circle highlights the third eighth-note stroke, which is a dotted eighth note. The text '(ride quarters continue . . .)' is positioned to the right of set B.

Example 4.13: Mid-measure kick-drum anacrusts in a 4/4 and a 7/8 groove: (A) Stone Temple Pilots's "Interstate Love Song" (1994) and (B) Sting's "St. Augustine in Hell" (1993).

Drums

$\text{♩} = 360$

C

Two measures of 7/16 drumbeats. The top measure is in common time (4/4) with a tempo of 360 BPM. The bottom measure is in 7/8 time with a tempo of 168 BPM. Both measures show a pattern of sixteenth-note strokes on the snare and bass drums.

Example 4.14: Two 7/16 drumbeats in the introduction of Moe's "Wind it Up" (2007).

to the possibility of parsing two measures of 7/16 in the space of each 7/8 measure. In "St. Augustine" this possibility is exacerbated by the presence of two further syncopated kick articulations within beats two and three (encouraging a 3,2,2 hearing of 7/16).²⁵ Despite the potentially ambiguous cues in the septuple grooves under consideration, snare articulations again clarify the situation. The final snare of each measure falls on beat seven, reinforcing the primacy of the eighth-note pulse (and potentially that of the quarter-note) and confirming that the bisecting kick drums are indeed anacrusts. As a counterexample, consider the second part of the introduction in Moe's "Wind it Up" (see Ex. 4.14), the only 7/16 passage in the corpus, in which an earlier snare corroborates the kick bisection in articulating a sixteenth-note pulse. The two closely related drumbeats annotated in the example lead to a third variant, in which the final dotted eighth note is overwritten by tom fills.

Another possibility, following a kick and snare on beats one and three, displaces the second snare off of the eighth-note beat but not the mid-measure kick. Three songs follow a pattern in which a quarter-note kick and snare are followed by the same alternation in dotted-eighth-note

²⁵ Many other examples of this type in Table 4.4 instead carry the kick syncopation into the second half of the measure. "Interstate Love Song" features an extended kick-drum syncopation of a different sort, anticipating the next downbeat with a dotted eighth-note cross-rhythm.

The transcription shows two staves. The top staff is for 'Electric guitar' and the bottom for 'Drums'. Both are in 7/8 time. The guitar staff has a tempo of 165 BPM indicated by a note with a '165' over it. The drums staff has a '7/8' time signature. The guitar part consists of five eighth-note chords: C[#]5, D⁵, D[#]5, E⁵, and C[#]5. The drums part includes a kick drum on the first beat and snare drums on the second, fourth, and sixth beats. Kick drum embellishments are marked with asterisks (*).

Example 4.15: A potential shift from eighth-note to sixteenth-note pulse, supported by the kick drum in Alice in Chains's "Them Bones" (1992).

durations. The quasi-metric syncopation in the second half of these measures is comparable to the first three beats of some 5/4 patterns (recall drumbeats D and E in **Ex. 4.1**).²⁶ The resulting groove can be understood in two different ways. First, we might retain the 7/8 feel associated with the earlier septuple pattern, interpreting a snare anacrusis to the expected beat-seven position. Second, we might feel a more forceful shift in pulse level, from eighth notes to sixteenths. The kick-drum embellishments in Alice in Chains's "Them Bones" express this metric idea explicitly as a shift in rhythmic durations (see **Ex. 4.15**).

Two further options regarding the second half of the measure are less common still. The simpler possibility omits a second snare altogether. Such drumbeat patterns rely on the stability of the initial kick and snare to establish the familiar quarter-note beat with eighth-note deletion. In the absence of a second snare articulation, the second half of the measure can be perceived as an upbeat to the subsequent measure. In two of the examples listed in **Table 4.4** (Dave Matthews Band's "Seven" and Seal's "Dreaming in Metaphors"), this upbeat interpretation is encouraged by syncopated kick-drum figures in the second half of the measure.

More metrically acute is the other less-common succession, in which a second snare articulates beat six. Radiohead's "Paranoid Android"—the lead single from their influential 1997 album, *OK Computer*—illustrates the metric complications prompted by this snare pattern (see **Ex. 4.16**). Above my transcription of the song's guitar solo (one of several passages in which three-measure spans of 7/8 time alternate with single measures of 4/4) I supply two dot annotations. Interpretation A outlines a (4,3)(3,4) subdivision at the sixteenth-note level, based in a very literal sense on the beats accented by the bass and drums. As we know, however, the kick drum often admits syncopation,

²⁶ Drumbeat E makes for an especially apt comparison since, in both cases, a kick-snare alternation follows a Platonic-trochaic succession—(3,3)(2,2) in the quintuple meter; (4,4)(3,3) in the septuple one.

The musical score illustrates two rhythmic interpretations (A and B) of a 7/8 time measure. The score includes three parts: Electric guitar, Bass, and Drums. The tempo is indicated as $\text{♩} = 155$. The score is divided into four sections labeled 1, 2, 3, and 4.

- Section 1:** Shows two interpretations of the first measure. Interpretation A uses vertical bar lines and marks with asterisks (*). Interpretation B uses vertical bar lines and marks with plus signs (+).
- Section 2:** Shows the second measure. The electric guitar part has eighth-note patterns with grace notes. The bass part has eighth-note patterns. The drums part features a 'ride bell' pattern with 'x' marks.
- Section 3:** Shows the third measure. The electric guitar part has eighth-note patterns. The bass part has eighth-note patterns. The drums part has eighth-note patterns.
- Section 4:** Shows the fourth measure. It is labeled 'A and B converge:' and shows the two interpretations coming together. The electric guitar part has eighth-note patterns. The bass part has eighth-note patterns. The drums part has eighth-note patterns.

Example 4.16: Two possible quadruple subdivisions of 7/8 time in Radiohead’s “Paranoid Android” (1997).

and so does the bass guitar when (as in the present situation) the rhythmic profiles of the two instrumental parts are closely related. The (2,2)(1,2) eighth-note structure shown in interpretation B is not only stylistically sensitive, accommodating a syncopated reading of the bass and drums, it also captures more appropriately the meter implied by the guitar melody. In either reading, the rhetorical force of the quadruple backbeat model is felt; in interpretation B, this model overrides the prohibition of successive strong beats in established metric theory. From the perspective of a normative 4/4 rock backbeat, the fourth beat of each measure arrives early, annexing the second half of an incipient beat three. In this interpretation the sense of hierarchical instability associated with metric irregularity (see Chapter 1) is exacerbated by the location of the metric deletion midway through the measure.

Examples of sub-metric septuple grooves that eschew the backbeat model entirely are exceedingly rare. For instance, the corpus includes only a single undifferentiated pattern in 7/8

(Radiohead’s “2+2=5”).²⁷ The final two examples of this meter are also unique. The 7/8 passages of Amos’s “Barons of Suburbia” are derived from a 6/8 framework, not from the more common 4/4 model. By extending the second beat (dotted quarter) of a duple 6/8 pattern, the most common drumbeat within the 7/8 measures of “Barons” is deceptively simple—a downbeat kick followed by a snare on beat four.²⁸ Amos often juxtaposes 6/8 and 7/8 measures; we find more examples of this in thirteen-beat patterns and other more complex amalgams. “Barons” itself is substantially more complex than indicated here; a more detailed analysis can be found in Chapter 6 (see **Table 6.6** and **Ex. 6.18**). Likewise, I reserve discussion of the remaining 7/8 groove in **Table 4.4**—Ben Folds’s “Bastard”—until later in the present section, when we are more familiar with the drumbeat conventions of 7/4 meters (see **Ex. 4.21** below).

METRIC-LEVEL SEPTUPLE TIME

At the level of the quarter note, septuple patterns are most readily intuited as repeating cycles of two-measure models. Situations in which relatively large irregular cardinalities occur at hierarchically deep levels encourage, and eventually necessitate, the abandonment of patterns that can be expressed simply—i.e., by a uniform time signature.²⁹ I have employed combinations of two time signatures already (above) as a way to clarify my understanding of certain subdivisional interpretations. Moreover, in the next chapter we will encounter longer repeating patterns, some of which comprise as many as nine measures. The logical boundary for our purposes is therefore that imposed by a change of formal section.

Returning to our discussion of metric septuple patterns, we find more variety among these grooves than in sub-metric septuple examples but less than with metric quintuple patterns. As at the sub-metric level, one metric septuple pattern stands out as more common than the others, and it is indebted to a standard backbeat model, diverging from the archetypal pattern only at the end of the repeating span. Another strategy that appears with some frequency in 7/4 grooves involves the

²⁷ While I hear this example in 7/8 time, it is worth noting that the lack of differentiated drum-kit articulations fosters some ambiguity. Osborn (2017), for instance, transcribes the groove in two different meters at different points—7/4 in Figure 2.1 (43) and 7/8 in Figures 3.3 (55) and 3.5 (58; note also the different dot annotations on these latter two figures). The author’s discussion on page 58 clarifies his flexible hearing of the ambiguous groove.

²⁸ This pattern is clearest in the first two measures of each prechorus (e.g., at 0:40). In the verse, 7/8 measures begin instead with a syncopation of two dotted-eighth-note floor-tom strokes—a pattern established in earlier 6/8 measures.

²⁹ This is not a relevant conceptual barrier to the present discussion of irregular patterns, but this is not to say that the span of music best represented by a measure is an arbitrary matter. As affirmed by Iyer (1998), London (2012), and de Clercq (2016), among others, the measure is a relevant and reasonably consistent reflection of our cognition of musical time.

	Drumbeat	Artist—Song (year)
Begins with Standard 4/4 Measure	Standard 3/4 Measure	_ 2 _ 4 _ 6 7 _ 2 _ 4 _ 6 7e _ 2 _ 4 _ 6 _ _ 2 _ 4 _ 6 7 _ a_ _ a_ _ a_ _
	3/4 as compressed	_ 2 _ 4 □ 6 □+ _ 2 _ 4 □ 6 □□+
	4/4***	
	4/4 + 6/8	_ 2 _ 4 □ 6□_+ _ +_+_+_+ 5+6+7+
	Begins with 3/4 Measure	_ 2 _ _ 5 _ 7 _ 2 _ _ + _ _ 7 _ 2 _ _ 5 _ 7
	Half-time feel	_ _ 3 _ _ _ 7 _ _ 3 _ _ _ 7 _ _ 3 _ _ _ 7
	Undifferentiated	Snare (x7): (3,4) □ _ □_ □ _ _ _
Other/Unique		_ _ 3 _ _ 6 _ _ _ 3 _ _ 6 7 (3,3)(2,2)(2,2) in Bass
		Tool—“Swamp Song” (1993)
	See Ex. 4.20	Tool—“Intension” (2006)
		Sum 41—“Nothing On My Back” (2001)
		Animal Collective—“What Would I Want? Sky” (2009)
		EL VY—“Sad Case” (2015)
		Sting—“I Was Brought to My Senses” (1996)
		Tool—“Swamp Song” (1993)
		Tool—“Intension” (2006)
		TTNG—“26 is Dancier than 4” (2008)

Table 4.5: List of repeating metric-level septuple grooves in the corpus.

incorporation or adaptation of tresillo patterns. **Table 4.5** catalogues the metric septuple examples of the corpus; kick drum articulations are supplied only when their presence clarifies the metric structure.

The most prevalent approach to 7/4 patterning can be expressed as a measure of 4/4 followed by one of 3/4 or, less often, 6/8. In the second measure, whether 3/4 or 6/8, the second quarter note is uniformly emphasized by a snare articulation. Three distinct structures are clarified only in the final beat-and-a-half of the pattern (see **Ex. 4.17**). Structure A is perfectly straightforward—a measure of 4/4 followed by one of 3/4. A double continuation in the 3/4 measure makes for the clearest expression of this structure (e.g., Foo Fighters’s “Times Like These”) but a kick on the final beat yields the same metric result (e.g., Fu-Manchu’s “Pick-Up Summer”). The patterns of articulations in the final beats of structures B and C are both strictly defined (note that no second-measure noteheads are bracketed in the example). Of the two, only structure C has a potential precedent among regular meters: the repeated pattern of quarter-note kick plus eighth-note snare

The figure consists of three rows, each containing a musical staff and a corresponding rhythmic pattern above it. Row A shows a standard 4/4 measure followed by a 7/4 measure. Row B shows a standard 4/4 measure followed by a 7/4 measure, with the final note of the first measure having a question mark in parentheses. Row C shows a standard 4/4 measure followed by a 7/4 measure. Above each row, the numbers '1' and '2' are placed above specific notes in the 7/4 measure, indicating a two-beat subdivision. The rhythmic patterns use dots for eighth notes and circles for sixteenth notes.

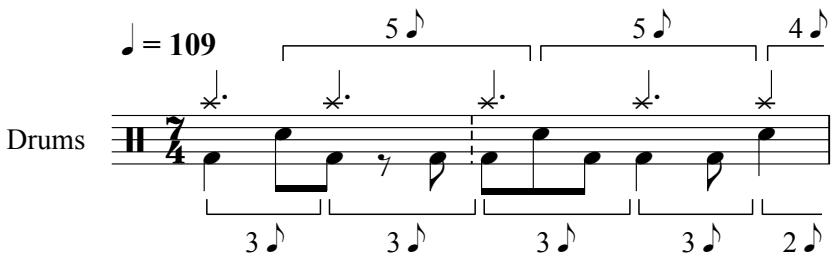
Example 4.17: Three metric septuple patterns, all beginning with a measure of standard 4/4.

suggests a measure of 6/8 time (as defined in Chapter 3, footnote 16). Structure B is the most curious of the three: the snare articulations are the same as those in structure C but, because of the later placement of the final kick, it is much more difficult to hear the beat departing from the quarter-note level. The most likely interpretation of this pattern is a variant of structure A, in which the final snare is not metrical. A more eccentric listener might entertain the possibility that the final beat represents a compression of two beats—i.e., if the final kick and snare lasted for a quarter note each, the groove would be a familiar standard rock beat throughout.³⁰ Of nine septuple passages that begin with a standard 4/4 measure, only two do not employ a typical backbeat. Amos's “Black-Dove” offers a unique variant on the traditional backbeat rhythm, displacing every snare continuation forward by a sixteenth note.³¹ In Metallica’s “The Day that Never Comes,” a septuple cycle alternates between 4/4 measures with a double-time backbeat and 6/8 measures with undifferentiated snare, in which the guitar riff establishes the (3,3) subdivision.

Metric septuple grooves that invert the quadruple-plus-triple idea are rather uncommon, again demonstrating a preference for Platonic-trochaic structures. All three passages with a 3/4 + 4/4 pattern begin with what appears to be a single-continuation expression of triple meter (i.e., Kick – Snare – [rest] and not Kick – Snare – Snare). Two of the examples continue with a conventional standard-backbeat 4/4, confirming the quarter-note beat of the initial 3/4 measure. The third

³⁰ This speculative hearing may have a practical antecedent in Blondie’s “Heart of Glass” (1978). The song’s first instrumental break (ca. 2:00) is in 7/4 and features drumbeat B. In a short documentary video posted to YouTube, Blondie guitarist and subsequent record producer Chris Stein speculates that the drumbeat resulted from an errant tape splice, though the plausibility of this theory is debated in the comments that follow the video (<https://youtu.be/2K4zdG0QfOA?t=8m34s>, accessed October 9, 2017).

³¹ The label following Krebs (1999) would be D4-1. Snare displacements of this sort characterize many grooves in “Black-Dove” as noted in **Table 3.3**.



Example 4.18: A complex septuple pattern containing tresillo ideas in Tool’s “Schism” (2001).

passage, an instrumental midway through Tool’s “Schism,” involves two incipient odd-cardinality pulse streams (see **Ex. 4.18**).³² The juxtaposition of a three-eighth-note pattern in the crash and kick with a potential five-eighth-note pattern in the snare substantially undermines the quarter note. The three-stream suggests a truncated double tresillo (3,3)(3,3)(2,2) against a series of snare articulations nearly identical to those of the other 3/4 + 4/4 examples. An interpretation that alternates between 6/8 time and single-tresillo 4/4 measures might offer a somewhat convoluted compromise. The friction between pulse-streams is a central feature of the meter of this groove, and one not easily represented by traditional time signatures.³³

Three of the 7/4 examples from the corpus can be understood as half-time grooves with the same rhythmic profile as the most common 7/8 pattern (the one based on the standard rock beat with an anacrusis to the fifth eighth note; cf. **Ex. 4.13B**). For the grooves found in EL VY’s “Sad Case,” Sting’s “I Was Brought to My Senses,” and Tool’s “Swamp Song,” tempo plays an especially important role in defining meter. **Table 4.6** lists eleven songs in the corpus that employ closely related drumbeats according to tempo (in beats per minute); the list includes two songs in which a floor tom takes the place of the mid-measure kick (see footnote 24) and one in which the second snare is usually omitted (Dave Matthews Band’s “Seven”). The range and variety of tempo markings is notable: while there are two small clusters in the high 180s and the 150s, the spread extends well below these ranges and is remarkably even overall. The lighter horizontal line in the table separates those songs I have identified in 7/8 (listed in **Table 4.4**) from those identified in 7/4 (**Table 4.5**).³⁴

³² Both pulse streams are merely incipient because they are bound to the septuple measure by a durational comma.

³³ The other Tool song in this category, “4,” has a similar cross rhythm in the kick—a stream of dotted eighth notes leading up to the final quarter-note snare. The resulting groove is far less ambiguous than that in “Schism,” though, primarily due to the convincing quarter-note continuations expressed by the three snare articulations.

³⁴ As noted earlier, the faster grooves promote a quarter-note entrainment (i.e., in 3.5/4 time) at metronome markings half of those listed in the table. The quarter-note pulse of the highest-tempo cluster (ca. 95 bpm) is very close to the “peak of *maximal pulse salience* around 600 ms (100 bpm)” given by London (2012, 31; original italics). The potential for ambiguity in the slower grooves can be explained in part by the fact that their tempi fall below the preferred entrainment range (86–120 bpm) when beating quarter notes but above it when beating eighths.

Artist—Song (year)	Tempo (BPM)
Sting—“Like a Beautiful Smile” (2003)	190
Dave Matthews Band—“Seven” (2009)	188
Moe—“Wind it Up” (2007)	188
Sting—“St. Augustine in Hell” (1993)	168
Tool—“Forty Six & 2” (1996)	158
Tool—“Ticks & Leeches” (2001)	153
The National—“Demons” (2013)	150
Dream Theater—“A Nightmare to Remember” (2009)	142
Sting—“I Was Brought to My Senses” (1996)	135
Tool—“Swamp Song” (1993)	129
EL VY—“Sad Case” (2015)	125

Table 4.6: List of septuple standard-backbeat variant grooves with mid-measure kick anacrusis.

It should go without saying that this apparent boundary is a fuzzy one. For instance, the groove in Dream Theater’s “A Nightmare to Remember” is only a little faster than that of Sting’s “I Was Brought to My Senses” and could just as easily be counted in 7/4. My preference for hearing the passage in 7/8 rests on contextual cues, such as the meters and tempi of adjacent formal sections and the expressive and timbral features of the passage itself.³⁵

In keeping with the relatively prescribed nature of septuple patterns, the patterns under the “other/unique” heading in **Table 4.5** do not completely abandon the 4+3 or 3+4 structures examined so far. Rather, they introduce ambiguity or combine familiar elements in novel ways. It could be argued, for instance, that a tresillo pattern is signaled by the three dotted-eighth-note kick articulations that begin each measure of the opening groove of Animal Collective’s “What Would I Want? Sky,” resulting in a 4+3 division of the measure. Such a structure is never manifested with any greater clarity, leaving the passage underdetermined. The drumbeat variation that begins the second verse of EL VY’s “Sad Case” combines the first four beats of the half-time groove that underpins most of the song with a single-continuation 3/4 measure. The second snare is even more mobile than my two annotations suggest. Sometimes it is absent, and thrice in the third verse it falls on the “and” of beat six, recalling the 4/4 + 6/8 model. A related groove in Tool’s “Swamp Song” is more consistent in its alternation of half-time 4/4 measures and double-continuation 3/4. Both examples support the intuitive idea that the broader archetype of 4+3 is a structurally robust one. Finally, the first half of Tool’s “Intension” follows a (3,3)(2,2)(2,2) structure similar to that found in

³⁵ London et al. (2016) give compelling experimental proof that judgments of tempo rely on more than simple entrainment to a quantifiable metronome rate.

[audio ex. only]

Example 4.19: A septuple groove underpinned by the bass in Tool's "Intension" (2006).

The transcription shows two measures of a septuple groove. The top section consists of a series of vertical dots representing a repeating pattern, with asterisks (*) and plus signs (+) placed above specific dots. The bottom section is a 'Drums' track in 7/4 time at 142 BPM. The drum patterns include various strokes (x, o, -) and rests, with a note labeled '(thin ride as crash)'.

Example 4.20: A two-measure (fourteen-beat) metric septuple pattern in TTNG's "26 is Dancier than 4" (2008).

"Schism" and "4°" but, as we have seen in other Tool songs, the meter is given most clearly by the bass part while the drums are more erratic (see **Ex. 4.19**).

My last example of 7/4 time, TTNG's "26 is Dancier than 4," combines full measures of 4+3 and 3+4 to create a pattern of fourteen beats—two measures of 7/4 or four measures of mixed meters (see **Ex. 4.20**). With patterns of this length, the choice of time signature becomes increasingly arbitrary. A transcription more devoted to reflecting the subdivision might be set in 6/8 + 1/4 + 6/8 (x2) + 4/4, whereas my use of 7/4 emphasizes hypermetric cohesion. As in earlier examples, the juxtaposition of tresillo patterns (as in the first four beats of the first measure) and 6/8 time complicates the odd-cardinality meter with the addition of potentially syncopated dotted-eighth-note successions. This example presents a further complexity, prompting a distinction between repeating and recurring patterns. Not shown in the transcription (but included in the listening example) is an extension of two beats at the end of every fourth 7/4 measure of this groove. The annotated measures contribute to a larger (thirty-beat) repeating structure (see **Table 5.5**). Despite the three-measure span of 7/4, the septuple meter cannot properly be said to repeat internally due to the changing subdivisions. Rather, when the thirty-beat span repeats, the shorter fourteen-beat unit under consideration recurs. In the present case, the drumbeat of the two measures shown (7+7) is replicated with only slight variation in the following two measures (7+9). Recurring patterns can sometimes be interspersed among formal units with wholly different drumbeats and grooves. In such cases, the acknowledgement of recurring patterns allows us to distinguish between formal sections with fully isolated irregularities (see Chapter 6) and those with locally isolated irregularities that belong to a broader consistent structure.

CONCLUDING ANALYSIS AND THEORETICAL REFLECTION

I conclude my consideration of septuple patterns with an analysis of a passage from Ben Folds's "Bastard." Forming part of the song's choruses, the excerpt transcribed in Example 4.21 exhibits both multi-measure patterning and ambiguity regarding tactus level and, like "26 is Dancier," the pattern is recurring rather than repeating.³⁶ The slow tempo marking of "Bastard" is conspicuous (note that the 7/8 meter belongs to the 3.5/4 type, thus the metronome marking could as easily read "quarter = 70"); it is especially debatable given the quick alternation of kick and snare in the song's verses, where it is the quarter note that moves at 141 bpm.³⁷ An analysis retaining the marking "quarter = 141" for the chorus is certainly defensible (the resulting eighth-note swing, for example, would be a more familiar feel than the posited sixteenth-note swing), but the analysis provided reveals striking similarities with a song from the classic-rock canon, Elton John's "Goodbye Yellow Brick Road." The hook of "Goodbye Yellow Brick Road," which opens the song as an instrumental and returns at the end of each chorus, follows the same quarter-note scalar descent in the bass from $\hat{1}$ to $\hat{4}$ found in "Bastard" (the former in F major, the latter in G major; see Ex. 4.22). In "Goodbye Yellow Brick Road," the presence of the standard rock beat alongside a deliberate articulation of the beat level by bassist Dee Murray gives a strong impression of a slow 4/4 meter.³⁸ The first measure of the chorus of "Bastard" is quite similar to the hook of "Goodbye Yellow Brick Road" in terms of harmony, rhythm, feel (i.e., swung sixteenths), and arrangement (including details like the use of ride cymbal). The melodies of both passages begin with an ascent tracing the tonic triad, though, where John continues upward triumphantly, Folds soon turns back downward. Finally, both songs tell stories about growing up and the pain that comes with self-reflection; thus, it may be that the allusion is intentional. In any case, the same musical features that establish the slow tactus of "Goodbye Yellow Brick Road" recommend a similarly slow tempo for "Bastard."

³⁶ The same ambiguity characterizes the other 7/8 pattern in "Bastard" (see **Table 4.4**), which belongs to the song's prechorus, as well as the 3/4 pattern that alternates with the groove under discussion in the chorus (see **Table 3.3**).

³⁷ This ambiguity is heightened on a first hearing by the fact that the drumbeat is largely withheld through the first verse, though the piano and bass play the same quarter-note pulse.

³⁸ Stephenson (2002, 17–18) analyzes the song instead in 2/2 time throughout, avoiding a change of meter when the hook in question is elided with the melismatic post-chorus. Importantly, though, his 2/2 interpretation implies a tactus at the same hierarchical level as my 4/4 hearing; de Clercq's (2016, [5.1]) approach also supports this reading since the slow drumbeat accompanies "a slow pacing of harmonic-melodic content": up to this point the harmonic rhythm has predominantly followed the half note and this may continue even into the hook, where F major retains prominence in the melody over the apparent V⁶ harmony.

Swung 16ths, ♩ = 141

Bass: G D/F# Em D C

Drums:

Example 4.21: Ambiguous septuple patterning in the chorus of Ben Folds's "Bastard" (2005).

♩ = 61

Bass: F C/E Dm Dm/C B♭ C⁷ B♭m

Drums:

Example 4.22: A harmonic and bass-line antecedent for "Bastard" in Elton John's "Goodbye Yellow Brick Road" (1973).

But tactus level is not the only source of metric ambiguity in "Bastard." My choice to notate two measures of 7/8 (3.5/4) rather than one measure of 7/4 may seem strange, especially given my prioritization of the drumbeat in judging the meter of a passage. Why, for instance, does the third kick-drum articulation align with the downbeat of a new measure, instead of syncopating against a continuing quarter-note pulse—one confirmed by a closing double snare continuation, no less? The answer lies primarily in the strength of the harmonic rhythm, though the cadence of the melody and rhythmic repetitions in the bass part also contribute. At a level only slightly deeper than the harmonic surface, the progression moves from tonic in the first measure to subdominant in the second. The weight of this shift is more persuasive to my ear than the preference for on-beat snare articulations. Furthermore, if we accept this hypermetric structure, there emerges a striking connection at the beat level between the two measures. The first follows a familiar pattern of sub-metric deletion: the final eighth note of a potential 4/4 measure is overwritten by a new downbeat. In the second measure, a different 4/4 model in the form of a tresillo is initiated (this is clearest in the repeated dotted figure in the bass) but again abbreviated by a deletion of an eighth note. Thus, despite the clear potential for a 4/4 + 3/4 structure in the drumbeat, cues in the rest of the band support two measures of 7/8 with subtly different internal subdivisions.

As noted at the outset of our discussion of septuple patterns, these metric frameworks offer a good context for examining the tensions between drumbeat cues and models of metric hierarchy, as laid out in Chapter 1. A comparison of 7/8 and 5/4 meters to the standard rock beat is instructive. If we wish to adjust a backbeat pattern to accommodate a quintuple meter, the change can be effected via an expansion (a two-beat span becomes three) and, since the equal treatment of 2s and 3s is characteristic of metric theory, this causes no conceptual issues. Conversely, the simplest adjustments that turn a 4/4 groove into 7/8 require metric deletion at a low hierarchical level (that of the eighth note) and such modifications of the metric fabric cut against theoretical tenets. Extant metric theories tell us that 2s are more readily likened with 3s than with 1s, suggesting in turn that expansion is a more comfortable transformation than deletion.³⁹ In spite of our theoretical expectations, however, my observations on septuple patterns show that the default metric archetype provided by the standard rock beat is a more powerful predictor of metric practice in rock music than is a preference for structures of expansion over those of deletion. That is, septuple patterns derived from the 4/4 model are most easily explained by deletion and are surpassingly more common than those that modify a 6/8 framework through expansion (Amos's work is exceptional in this regard). This trend is inverted at larger cardinalities: thirteen-beat patterns are often modeled as 6+7 or vice versa and are much more common than fifteen-beat patterns (be they 8+7 or 16-1).

Broader comparison of quintuple and septuple meters establishes several important distinctions and commonalities, which are fundamental in understanding metric irregularity in rock. Trends within both cardinalities demonstrate the relevance of Murphy's concept of Platonic-trochaic successions. The popularity of the standard backbeat as a drumbeat template is also common to quintuple and septuple meters, as is the relative paucity of undifferentiated examples (especially when compared to patterns in the tresillo family). Where quintuple meters exhibit great structural variety, septuple meters are far more consistent. The degree to which a given meter supports structural diversity is a useful gauge of drumbeat practice within irregular metric spaces in rock, and it may allow comparison between rock and other popular genres. The applicability of expansion and deletion in explaining irregular groove structures is another central feature along which distinctions can be drawn. Examples like Amos's expanded septuple structures are all the more distinctive when

³⁹ London's (2012, 92) WFC 2.2, that "the beat cycle must involve at least two beats," supports the first of these ideas explicitly and the second indirectly in pure duple structures.

we appreciate their inversion of typical practice. The same ideas that emerge in our consideration of quintuple and septuple patterns—Platonic-trochaic succession, backbeat and undifferentiated drumbeat templates, structural diversity, and expansion and deletion—continue to enrich our analysis of cardinalities of nine, eleven, thirteen, and larger in Chapter 5.

— 5 —

Uncommon Irregular Patterns: Cardinalities of Nine and Greater

Large-cardinality irregular patterns account for a substantial portion of the repeating grooves of the corpus. Taken together, there are about as many examples of these large patterns as there are of quintuple and septuple meters combined. This chapter further divides the remaining examples into two categories, based on the frequency with which each cardinality appears in the corpus. In the first category, we find three cardinalities that are moderately prevalent—twelve examples in irregular nonuple meters (i.e., excluding (3,3,3) structures), eleven in undecuple (eleven-beat) meters, and nine in tredecuple (thirteen-beat) meters.¹ In this context, the questions that emerged as central to understanding quintuple and septuple structures remain pertinent. The second category comprises a far more diverse collection of metric structures with no more than four representatives each, including even-cardinality patterns and ranging in cycle span from ten to sixty-one beats. To establish commonalities among this collection, I theorize two new models of additive successions—*punctuated* and *split* types—which are better suited to the analysis of multi-measure cycles.

An important distinction can be drawn between two types of listener engagement with irregular grooves. Listeners can easily entrain to shorter repeating cycles, developing an immediate, intuitive connection to a groove. With progressively longer temporal spans, our ability to entrain gradually attenuates.² I posit that, as entrainment loses its efficacy, some listeners may choose to track irregularity through different means—either by counting, or by chunking and intentionally shifting one’s entrained expectations for different chunks. Where the entrainment model is colloquially described as *feeling* the groove, the other strategies could be described as *thinking* the groove. The boundary between the two modes of attending is fluid and will vary for each listener; differences in tempo complicate matters further. I therefore refrain from drawing a distinction between examples

¹ I find it interesting that the longest repeating super-metric patterns also have a cardinality of 13 (cf. **Table 3.5**), though this is likely a simple coincidence.

² London (2012, 29) suggests that metric entrainment has an upper limit of 1.8–2 seconds, following research by Fraisse (1982), Monohan (1993), and others.

that are better suited to one mode or the other. In transcribing grooves with larger repeating cycles, there is often more than one viable arrangement of measures and time signatures. As such, the question of notating these larger cycles requires that certain distinctions be made. For the sake of consistency, I employ dashed bar lines for metric-level grooves with cycles of seven to ten beats (as in **Exx. 4.17–20**) and split larger cycles into multiple measures. At the sub-metric level, these numbers are doubled.

Grooves in 9, 11, and 13

In addition to appearing with approximately the same frequency as one another, cardinalities of nine, eleven, and thirteen behave similarly in matters of measure length and internal subdivision (the same can also be said of septuple patterns). At the sub-metric level, in any of these cardinalities, each cycle through a repeating pattern can be parsed as a single measure. At the metric level it is usually more intuitive to transcribe these grooves in repeating sets of two or more measures. Thus, at the metric level, the division of these patterns into two near-equal halves (e.g., nine as 4+5 or vice versa) is essentially ubiquitous. We find the same trend at the sub-metric level with very few exceptions. Less pervasive is the marked preference for Platonic-trochaic successions observed in the previous chapter, at least at the musical surface. At a local level, groupings of five are usually trochaic (3,2) in undecuple patterns, but the iambic (2,3) dominates in nonuple grooves. Groupings of seven (mostly within tredecuple patterns) show a strong preference for the Platonic-iambic options of (3,2,2) or (3,4). One level up, the situation is far more stable: Platonic-trochaic patterns outnumber Platonic-iambic ones three-and-a-half times over.³ Platonic-trochaic successions can often aid listeners in entraining to longer repeating spans by marking the end of a cycle with an expansion or deletion—a punctuation mark of sorts. These three cardinalities are also alike in terms of articulation patterns: as was the case with longer tresillo relatives, the articulation of larger irregular structures is often undifferentiated. Otherwise, strict kick-snare alternation remains a popular device, usually employed in a noticeably straightforward manner (i.e., with less syncopation in the kick drum than in 5 and 7). This straightforwardness is another feature that may help the listener navigate such unconventional metric spaces. Finally, because a single cycle can span two measures, drum fills are often integrated into the repeating pattern, as in several examples of triple super-meter.

³ Recall that Murphy's (2016, [1.7]) approach is based on a simple comparison of the durations of run and comma. With larger cardinalities, this division seldom coincides with (hyper)metric structure.

NONUPLE PATTERNS

Structures of nine are about equally common at metric and sub-metric levels as were septuple patterns (see **Table 5.1**). Six songs contain grooves of the former type, eight the latter, though several songs have multiple grooves yielding even more diversity at the sub-metric level. At either level, the preferred subdivision approximates two even halves, alternating four- and five-pulse units, and at both levels the order of these halves is about evenly split (between 5+4 and 4+5). While undifferentiated articulation occurs at both levels, it is more common at the metric level, accounting for half of the 9/4 examples; this follows the observation that undifferentiated patterns are generally more prevalent within longer patterns (cf. tresillo structures in Chapter 3). Variations on the standard rock beat also occur at both levels: examples in 9/4 expand each two-measure cycle by a beat; those in 9/8 expand each measure by half a beat. Exceptions to the undifferentiated and standard-backbeat templates mostly involve interaction between hierarchical levels. Radiohead's "Codex," for instance, includes a cross-rhythm between a quarter-note kick drum and a harmonic rhythm that changes every four-and-a-half beats (see **Ex. 5.1**). The mid-cycle chord change may sound to some like an anticipation of the subsequent beat, resulting in a (5,4) subdivision at the beat level. Tool's "Rosetta Stoned" and "Crawl Away" are distinct for their (6,3) division of the sub-metric structure. The former contains a clear double-continuation 3/4 followed by a compressed kick-snare alternation of only three eighth notes' duration.⁴ The latter extends a double tresillo at the sixteenth-note level by an additional eighth note, separating the (3,3)(3,3) run and the (2,2,2) comma by articulating each with a different drum—first snare, then kick. The persistent dotted rhythm in "Crawl Away" may encourage some to hear it in 18/16. My final two analyses in this section also involve ambiguity of tactus, in both cases due to complications at the level of the sixteenth note.

The lone 9/4 passage in Tool's "Jambi" (most of the song is in 9/8) is notable for its rejection of a consistent pattern—whether standard backbeat or undifferentiated succession (see **Ex. 5.2**). The passage follows a formal layout familiar from other Tool songs: after setting up a vamp with guitar and bass, the drums enter with syncopated tom work (alongside the vocals) before moving into a more conventional groove with kick and snare. The bass is the clearest metrical cue through the initial vamp and continues to underpin the meter through the first section with drums. The

⁴ The structure of this groove is the same as that of Dave Brubeck's "Blue Rondo a la Turk" (see Chapter 1), but the Tool excerpt is more emphatic in its (6,3) division because of the deployment kick and snare drums. (I.e., I do not find it difficult to hear "Blue Rondo" as (3,3,3) with syncopation, whereas the same hearing of "Rosetta" is less intuitive.)

		Drumbeat	Artist—Song (year)
Metric (9/4)	Kick and Snare Alternation: 4/4 (x2) Expanded	(2,3)(2,2): (KS,KSS)(KS,KS) (2,2)(2,3): (KS,KS)(KS,SKS)	Slint—“Breadcrumb Trail” (1991) Tori Amos—“God” (1994)
	Undifferentiated	Hi-hat every eighth note (5,4) Kick every quarter note (9:2) Kick every quarter note (9:4)	Bastille—“Flaws” (2013) Radiohead—“Codex” (2011) Sting—“Big Lie, Small World” (1999)
	Other	(3,2)(2,2): guitar riff, then drumbeat in two sections	Tool—“Jambi” (2006)
Sub-metric (9/8)	Kick and Snare Alternation 4/4 Measure Expanded	(2,2)(2,3)	Björk—“Hollow” (2011)
		(2,2)(2,3)	OSI—“Memory Daydream Lapses” (2003)
		(2,3)(2,2)	Sting—“I Hung My Head” (1996)
		(2,2)(2,3)	Tool—“Jambi” (2006)
	Other	(3,3,4)(4,4) at sixteenth level; see Ex. 5.3	Soundgarden—“Black Hole Sun” (1994)
		(2,2,2)(3): (K-S-S-)(KS-)	Tool—“Rosetta Stoned” (2006)
	Undifferentiated	Synth every eighth note	Björk—“Hollow” (2011)
		Toms (3,2,2,2)	Tool—“Jambi” (2006)
	Near-undifferentiated	Snare (2,2)(2,3)	Sting—“Big Lie, Small World” (1999)
		Snare dotted eighths, then kick every sixteenth (3,3)(3,3)(2,2,2)	Tool—“Crawl Away” (1993)

Table 5.1: List of repeating grooves with nonuple meter or sub-meter in the corpus.

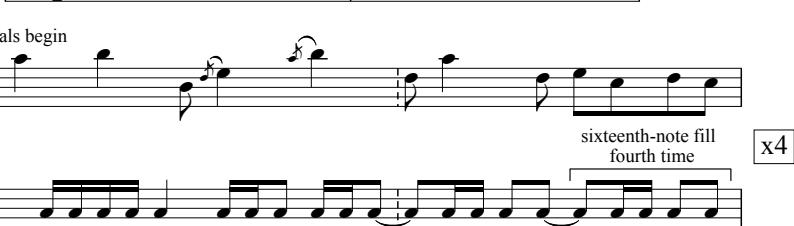
[audio ex. only]

Example 5.1: A 9:2 cross-rhythm in Radiohead’s “Codex” (2011).

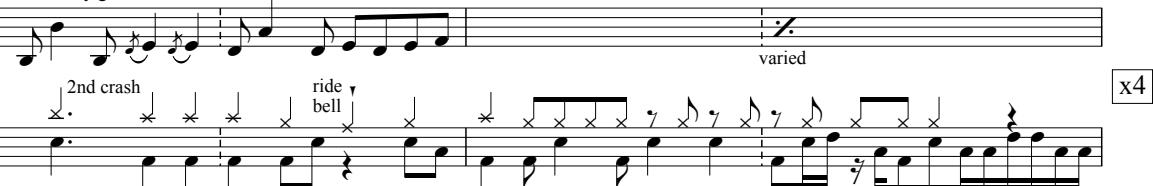
harmonic rhythm implied by the bass line outlines a pattern of (3,2)(2,2) in quarter notes, but the first D₄, syncopated at the melodic highpoint, may prompt some listeners to hear the first half of the measure as (3,3,4) at the eighth-note level. When the drumbeat shifts to the second groove, a complex pattern is formed through the commingling of several competing ideas, including the standard backbeat and suggestions of half-time and tresillo, as well as soloistic play. The notated measures span twice the duration of the previous two groove states, reflecting the placement of a drum fill in the second half of every second measure. Apart from a few overarching structural ideas—the regularity of fills and a rough adherence to a (3,3,4)(4,4) succession—the drumbeat is highly irregular. For instance, the articulation of beats four and five is usually given by the kick but occasionally by the snare instead. Similarly, the double-continuation tresillo idea in the second half of the first measure is not repeated in subsequent cycles. Instead, the half-note division is emphasized, allowing a half-time interpretation: (3,3,4)(4,4) folds into (3,2) at a quasi-metric dotted-

$\text{♩} = 111$
guitar plays syncopated rhythms on D pedal

Bass: 

Drums: 

133 vocals begin


137 doubled 8va by guitar


Example 5.2: Three stages in the evolution of a half-time 9/4 groove in Tool's "Jambi" (2006).

$\text{♪} = 109$

Electric guitar: 

Drums: 

main interpretation:
(kick - - snare - - - kick) (snare continuation)

alternative interpretation:
(kick - - - [tom] - - - kick)

Example 5.3: A syncopated 9/8 groove in the guitar solo of Soundgarden's "Black Hole Sun" (1994).

quarter/half-note level. Ultimately, these various inconsistencies add a virtuosic veneer to the passage, without dislodging its solid (though irregular) metric structure.

A strikingly similar groove to that just examined accompanies the guitar solo of Soundgarden's "Black Hole Sun." Despite the similar metric structure, and a slightly slower tempo than Tool's, I identify this passage in 9/8 time rather than 9/4 (see Ex. 5.3). This hearing is supported

[Intro] ♩ = 160

Acoustic guitar

Tambourine

(sympathetic resonance)

Verse 2

guitar tacet at first, later returns as before; tamb. continues throughout

Drums

Example 5.4: Persistent 9:2 cross-rhythms in Sting's "Big Lie, Small World" (1999).

contextually: the texted sections of "Black Hole Sun," mostly in 4/4, move at a pace befitting a dirge (beginning around 52 bpm and accelerating very slightly through the first three minutes). More important, though, are the slow harmonic rhythm and drumbeat retained into the solo—the same features that establish the slow tempo through the rest of the song. Unlike those of "Jambi," the drums in "Black Hole Sun" consistently emphasize the two-beat division of the second half of the measure, usually marking beat eight with a snare (sometimes displaced forward, mirroring the kick anacrusis to beat six). Of course, there remains substantial ambiguity, as in all cases with such a slow tempo. In "Black Hole Sun," this ambiguity is exacerbated by the frequent drum fills that preclude an entirely stable beat, and by the insistent dotted rhythm through the first half of each measure. It is easy enough to hear my notated eighth notes as quarters, doubling or halving the tactus at the borders of the solo. A third possibility is to entrain to the dotted rhythm and maintain a compound beat through the full passage, hearing two measures of 9/16 in the span of each cycle (i.e., (3,3,3)(3,3,3)).⁵ The resulting compound triple meter follows a single-continuation pattern (Kick – Snare – Kick)(Kick – [Tom] – Kick), shown below the transcription.

My final example of nonuple time is more ambiguous still. The vamp that opens Sting's "Big Lie, Small World," before the entry of the drums, presents a delicate 9:2 cross-rhythm between guitar and tambourine (see **Ex. 5.4**). The accentuation of the tambourine is subtle, anticipating the

⁵ This hearing is improbable because the same listener who would be conservative enough to maintain the dotted rhythm as a consistent beat is unlikely to be radical enough to be tempted by the metric modulation required to shift to this new tactus.

forthcoming articulation of higher-level pulse streams. The drum kit is incorporated slowly, first marking only the downbeat of each measure in the kick. In the first chorus, the kick provides a new cross-rhythm by articulating every quarter note. This new layer complicates matters substantially, as it encourages entrainment to the quarter note; many listeners may begin to hear in 9/4. The idea is familiar enough—Gorillaz’s “5/4” similarly combines a quarter-note drumbeat with an odd-cardinality, sixteenth-note guitar figure (cf. **Ex. 3.18**).⁶ But whereas Gorillaz’s groove employed the standard backbeat in the drum kit, the lean kick drum of “Big Lie” embraces ambiguity. Immediately in the second verse, the guitar drops out and a new snare part joins the kick, establishing a 9:2 cross-rhythm one level higher than that between guitar and tambourine. (The transcribed drumbeat is varied slightly upon repetition, usually only shifting the sixteenth-note anacrustes to different snare and kick articulations.) The presence of a snare on each downbeat makes it difficult to parse the drums together as a backbeat variant. I find myself following either the kick or the snare and shifting my perceived tactus as I move from one to the other. In the second chorus all four layers come together, producing a 9:4:2 cross-rhythm. The sustained ambiguity of “Big Lie” is rare, especially in an irregularity of this large a cardinality where we most often find clear articulation of either a standard backbeat variant or a repeated undifferentiated pattern. Sting’s song negotiates a middle ground, never fully committing to either approach. The resulting metric space captures the narrator’s distressed psychological state while pointedly ignoring the mounting action as his situation becomes progressively more concerning and ludicrous over the course of the song.

UNDECUPLE PATTERNS

Patterns of eleven share a number of features with those of nine (see **Table 5.2**). Metric and sub-metric examples are both represented, with several songs employing multiple grooves in the same meter. Drumbeats either vary the backbeat model, occasionally incorporating a double-continuation expression of triple division, or they are undifferentiated—a feature that remains more common in metric-level examples. Two-part division of the cycle characterizes all but one of these passages, the exception being an 11:2 cross-rhythm in Hail the Sun’s “Testostyrannosaurus.”⁷ Indeed, sub-metric undecuple grooves are strikingly consistent, always varying the 12/8 structure of (3,3)(3,3) through

⁶ Note also the quarter-note cymbals in the odd-cardinality sub-metric contexts of Sting’s “Seven Days” (**Ex. 4.8**) and “St. Augustine in Hell” (**Ex. 4.13B**).

⁷ This example is not interpreted as sub-metric because it reprises an earlier (11/4) passage (also transcribed in **Table 5.2**) with the only substantial change being that of the drumbeat.

		Drumbeat	Artist—Song (year)
Metric (11/4)	Kick and Snare Alternation	(2,3)(2,2,2): ((K-S-)(K-S--S)) ((K-S-)(K-S-)([fill]))	Dream Theater—“A Nightmare to Remember” (2009)
		(3,3)(3,2): (K-S)(K-S)(K-S)(KS)	Tool—“Right in Two” (2006)
	Half-time ideas	(3,2,2)(2,2): (KS[fill])(K[fill])	Tool—“Right in Two” (2006)
		(3,3)(3,2): (K--SS-)(KS-[fill])	
		Snare ((3,3)(2,2,2))((3,3)(2,2))	Tool—“Swamp Song” (1993)
		Guitar (3,3)(3,2)	Tool—“Right in Two” (2006)
	Undifferentiated	Snare every quarter note	Hail the Sun—“Eight-Ball, Coroner’s Pocket” (2012)
		Snare every half note (11:2)	Hail the Sun—“Testostyrannosaurus” (2012)
		Snare ((3,3)(2,2))((3,3)(2,2,2))	Incubus—“Adolescents” (2011)
	Near-undifferentiated	Snare ((3,3)(2,2))((3,3)(2,2,2))	Hail the Sun—“Testostyrannosaurus” (2012)
Sub-metric (11/8)	Kick and Snare Alternation: 12/8 Measure with Deletion	(3,2)(3,3) (3,3)(3,2)	Dream Theater—“A Nightmare to Remember” (2009)
		(3,3)(3,2)	Primus—“Eleven” (1991)
		(3,3)(3,2)	Tool—“Undertow” (1993)
		(3,3)(3,2); w/ dotted-8th sync.	Tool—“Hooker with a Penis” (1996)
		(3,3)(3,2)	Tool—“Rosetta Stoned” (2006)
	Undifferentiated	Snare + Crash (3,2)(3,3)	Tool—“Right in Two” (2006)
		Twice: Snare + Hi-hat; Kick (3,3)(3,2)	Tool—“Rosetta Stoned” (2006)

Table 5.2: List of repeating grooves with undecuple meter or sub-meter in the corpus.

deletion (almost always at the end of the measure). In this respect, the preferred patterns of sub-metric undecuple time are closely related to those of sub-metric septuple time: both structures modify the standard rock beat through a sub-metric deletion but, where septuple examples are in simple time, undecuple passages employ compound time. In Tool’s “Hooker with a Penis,” a cross-rhythm of three sixteenth notes emphasizes the feeling of a long run (six groups of three sixteenths) followed by a shorter comma (four sixteenths).⁸

Dotted syncopations are more common among 11/4 passages (at the more stable eighth-note level), appearing in about half of the songs in the present sample. The repetition of this familiar rhythmic idea near the midpoint of a cycle clarifies the division of these patterns into two measures. Among metric-level examples, the passage from Dream Theater’s “A Nightmare to Remember” stands out for its unique structural asymmetries (2,3)(2,2,2). The comprehensibility of the groove

⁸ Analysis of this song is complicated by its ambiguous tactus—the result of several metric modulations. It is also possible to count what I have labeled sixteenth notes as eighths, in which case one might consider a reading of the irregular passage in question in 22/8 (12/8 + 10/8).

Intro and Verses $\text{♩} = 116$

Electric guitar (with delay) (let ring)

Choruses $\text{♩} = 122$

Voice: D⁵, B_b⁵, C⁵, G⁵
Got-ta di-vide it all right in two

Drums

Heavy Inst. $\text{♩} = 126$
doubled 8va by guitar

Bass
(2nd crash)
Drums

Example 5.5: Three different 11/4 grooves in Tool's "Right in Two" (2006).

rests on the consistent placement of snare articulations: these fall on beats two and four in the first half and on beats seven and nine in the second (or on beats two and four of a second measure). The half-time drumbeats of Tool's "Right in Two" are also unlike the undecouple patterns of any other song. Because "Right in Two" is primarily in eleven and employs numerous different grooves with this cardinality, I offer a somewhat longer discussion of the song.

As we saw in our earlier analysis of Tool's "The Grudge," the band sometimes focuses on a single irregular cardinality through most or all of a song, presenting different subdivisional possibilities or expressing the irregularity at various hierarchical levels. This is also true of "Right in Two," which showcases a diverse set of undecouple grooves (see **Ex. 5.5** and note the five distinct patterns given in **Table 5.2**). The first three-and-a-half minutes of the song are built on a D-Phrygian ostinato for guitar and bass, the harmonic rhythm of which clearly outlines a (3,3)(3,2) pattern. Because this subdivision is such a strong hallmark of 11/8 time, and because many of the

drumbeats later in the song support this tactus, it is easy to hear much of “Right in Two” in a slow compound meter. However, my 11/4 interpretation suits the first half of the song with a more comfortable range for the tactus (which accelerates modestly throughout the song, averaging around 120 bpm). As the first three verses unfold, percussive elements are added to the texture—first tabla, then drum kit—both occupying an improvisatory role rather than dictating the metric structure.⁹

The first clear drumbeat of “Right in Two” makes an emphatic entry with the first chorus. This section deploys drumbeat, form, and tactus in a complex way. Disentangling the ambiguity of tactus noted above is central to understanding this groove. Based on the cognitive preferences of listeners, it seems likely that most will have entrained to the quarter note as transcribed; however, when the drumbeat arrives, the only snare continuation comes on the fourth beat of the pattern, suggesting that the meter is actually the slow 11/8. Formally, we have entered a new section and, although Tool is known for songs of larger proportions, a three-and-a-half-minute span is a relatively long time without a substantial change in the groove. Thus, even a listener who perceived a quarter-note pulse during the previous music may be agreeable to a shift in tactus (quarter \Rightarrow eighth) at this long-awaited formal boundary. Finally, there are the non-drumbeat cues to consider: both the harmonic rhythm and the rate of vocal delivery support a half-time hearing of this passage (supporting the retention of a quarter-note tactus). This is my preferred interpretation, but it must be said that the resulting structure is highly irregular, especially in view of the near-codified nature of undecuple patterns as “twelve-with-a-deletion.” Instead of 5+6 or 6+5, the high-level division of this 11/4 groove is 7+4. The first of these lopsided halves receives (3,2,2) triple articulation (single-continuation on the first pass but often double thereafter), while, in the second half, a fill usually overwrites the expected structural snare at the midway point.

The next consistent drumbeat in “Right in Two”—a heavy instrumental—is decidedly in 11/4. The snare is more active, articulating a continuation in each measure (as transcribed in **Ex. 5.5**), and the common (3,3)(3,2) structure of the opening returns. This drumbeat is gradually modified as the drums take on a more soloistic role, incorporating dotted-quarter syncopations ever more pervasively, and eventually transitioning to the undifferentiated sub-metric pattern (3,2)(3,3). The extended instrumental culminates by setting the initial (11/4) guitar riff against the new (11/8) drum pattern (included in the audio example as “InstEnd” but not transcribed). A final verse follows over

⁹ The tabla elements in this song, including an extended solo in the second half, deserve closer attention than the present analysis can accommodate.

a new drumbeat, in which the earlier half-time groove is modified to accommodate the (3,3)(3,2) subdivision (the second “half-time idea” given in **Table 5.2**). The song closes with a second iteration of the chorus, with virtuosic embellishments to the earlier (3,2,2)(2,2) drumbeat, and an instrumental denouement that reinstates the initial (3,3)(3,2) structure.

TREDECUPLE PATTERNS

Grooves in 13 differ from those in 9 or 11 as they are far from evenly split between metric and sub-metric patterns. **Table 5.3** records only two examples of the former and ten of the later (across seven songs). Because of the relative scarcity of metric-level examples, undifferentiated articulations are less common here than in the previous two cardinalities. As in undecuple patterns, the most common way to structure sub-metric tredecouple time is by adapting 12/8: in eleven the required adaptation was an eighth-note deletion, while in thirteen it is an expansion. Platonic-trochaic successions remain prevalent among these patterns, most of which are subdivided as (3,3)(3,4) or (3,3)(3,2,2). Because this subdivisional structure is based on a compound meter, the seven-pulse halves of most sub-metric tredecouple grooves do not follow the preferred model observed in examples of 7/8 time. Only two songs derive the septuple halves of 13/8 patterns from a simple-time standard backbeat (with deletion)—Dream Theater’s “Metropolis Part 1: The Miracle and the Sleeper” and Nine Inch Nails’s “The Becoming.” In both cases, the six-pulse half of the pattern is a measure of triple meter, retaining a quarter-note beat throughout almost all of the cycle.

Within the more common compound-time model, Tool’s “Schism” is the lone exception to the normative Platonic-trochaic subdivision patterns. Instead of placing the expansion at the end of each cycle, the four-pulse group comes in the middle of the pattern (see **Ex. 5.6**). In this example, Tool subverts not only the expected subdivision, but also the expected drumbeat pattern, frequently inverting the placement of kick and snare (i.e., placing snare articulations on metrically strong beats, including downbeats). Finally, “Schism” is one of three songs in which a given subdivisional structure is articulated in two different ways (the others are Dream Theater’s “Metropolis Part 1” and Tori Amos’s “Carbon”). The change in the drumbeat occurs during the septuple measures of the pattern—compare the first and second systems in my transcription.

Although both of the 13/8 drumbeats in Amos’s “Carbon” follow the expected structure (extending a 12/8 template), neither is straightforward. Drummer Matt Chamberlain’s tom work deftly navigates the irregular meter, complementing the (3,3)(3,4) structure of the bass and guitar

		Drumbeat	Artist—Song (year)
Metric (13/4)	Kick and Snare	(3,4)(2,2,2): ((KSK)(KSKK)) ((KS)(KS)(KS))	Radiohead—“Sail to the Moon (Brush the Cobwebs out of the Sky)” (2003)
	Undifferentiated	Kick every quarter; piano clarifies (3,3)(3,4)	Ben Folds—“Bastard” (2005)
Sub-metric (13/8)	Kick and Snare Prevalent quarter-note pulse	(2,2,2)(2,2,3), (KS_)(KSS) two ways: (KSK)(SKS) (2,2)(2,1)(2,2,2): (K_S_) (K_S)(K_S_[fill_])	Dream Theater—“Metropolis Part 1: The Miracle and the Sleeper” (1992) Nine Inch Nails—“The Becoming” (1994)
		(3,3)(3,2,2): (KS)(KS[S])	Tool—“Flood” (1993)
	Prevalent dotted-quarter-note pulse	(3,3)(2,2,3), (SK)(KSK) two ways: (SK)(SKK)	Tool—“Schism” (2001)
		(3,3)(3,2,2): (KS)(KS[fill])	Tori Amos—“Spark” (1998)
	(3,3)(3,4): (TS)(TS)		Tori Amos—“Carbon” (2002)
	Undifferentiated	Snare (3,3)(3,2,2) Toms (3,3)(3,2,2); Ex. 5.7	Tool—“Undertow” (1993) Tori Amos—“Carbon” (2002)

Table 5.3: List of repeating grooves with tredecuple meter or sub-meter in the corpus.

$\text{♪} = 215$

Example 5.6: Subtle variations on a 13/8 structure in an early instrumental in Tool’s “Schism” (2001).

while supplying soloistic touches. An incipit of the first verse captures the rhythmic character of these passages (see **Ex. 5.7A**). Note that a consistent articulation of (3,3)(3,2,2) underpins the elaborate musical surface, with the floor tom standing in for the kick drum and the rack tom marking continuations in place of the snare (i.e., Floor-tom – Rack-tom – Floor-tom – Rack-tom – Floor-tom). Note also that, on balance, the most metrically stable rhythmic positions receive the longest note durations, stressing their importance in the underlying structure. In the second verse

$\text{♪} = 158$

Drums

Example 5.7A: Toms simultaneously supporting and embellishing a 13/8 structure in the second verse of Tori Amos's "Carbon" (2002).

the groove comes closer to a variant of the standard backbeat, incorporating snare drum articulations of beats four and ten into the texture (**Ex. 5.7B**, audio only). This change of drumbeat is subtle: the snares are left off (blending better with the surrounding toms), and the floor tom retains the role normally played by the kick drum. My choice to catalogue this second drumbeat under "Kick and Snare" and the first under "Undifferentiated" in **Table 5.3** is a compromise in view of the mixed elements of both patterns evinced by these grooves.

Larger Cardinalities

In treating the largest irregular cardinalities of the corpus, ambiguity becomes ever more common. Ambiguities present themselves not only in the particulars of a passage (i.e., among competing interpretations for grouping structure) but also with regard to broader theoretical questions. It is often a relatively straightforward matter to identify familiar drumbeat patterns—including many of those introduced in Chapters 3 and 4—and thus to parse a given passage according to a series of changing meters. However, the corpus simply does not supply enough examples of any single large-cardinality pattern to recommend a preferred structure. I therefore adopt a more general approach.

I propose that most large-cardinality patterns can be understood as following one of two additive logics, which I term *punctuated* and *split*. In the punctuated type, patterns in which one meter predominates are interrupted at regular intervals by a single isolated irregularity.¹⁰ Without exception, this interruption comes at the end of the repeating cycle, forming a Platonic-trochaic succession at the highest level (or, put differently, exceptions to this trend are so rare that they foster ambiguity). The initial 11/4 groove of "Right in Two" demonstrates a relatively simple punctuated structure, in

¹⁰ The following chapter treats isolated irregularities in greater detail. Although the involvement of any such irregularity in a punctuated structure blurs the boundary between the isolated and cardinal/sectional types, I understand the former as subordinate to the latter in a larger repeating pattern.

which a single measure of 2/4 punctuates an otherwise 3/4 metric fabric.¹¹ Instances of the split type comprise two or more subsections, the lengths of which are approximately balanced. In the clearest split patterns, subsections are easily differentiated by a change in pulse grouping (e.g., shifting from 2s to 3s); when no such change occurs, cues in phrasing or arrangement are typically required to support a split interpretation. While the structures of most of the larger patterns I have identified are best described as either punctuated or split, there exist several ambiguous cases. The relationship between the two templates could well be described as a spectrum; however, a strong majority of cases can be understood clearly as one type or the other. I begin by reviewing punctuated and split examples in turn before considering rarer instances of ambiguity.

Within my overarching categories of punctuated, split, and ambiguous strategies, hierarchical level again becomes more informative than cardinality: there are so few examples of any given cardinality that seemingly apparent commonalities are often the product of coincidence. As in some of the larger super-metric patterns observed earlier, we encounter examples of even cardinalities. These are more common among the split type, where two odd-cardinality subdivisions may be combined to form a larger even pattern.

PUNCTUATED IRREGULARITIES

As we explore these increasingly long patterns, sub-metric structures remain more common than metric ones. We also see the sixteenth note become a more viable hierarchical level for irregular experimentation, though these examples remain especially rare. **Table 5.4** presents the punctuated large-cardinality patterns of the corpus—seven at the metric level, eleven at the sub-metric, and four with a sixteenth-note pulse. In this and other tables in this section, I further abbreviate drumbeat information, now showing only the subdivision of the cycle as a series of time signatures. Shifts of tactus between adjacent time signatures are common in my annotations, following my practice in earlier transcriptions. These shifts accommodate dotted cross-rhythms or allow the pairing of meters like 4/4 and 7/8, where the sub-metric irregularity is caused by a deletion and the cycle is mostly characterized by a quarter-note tactus. Divisions are usually supported by the confluence of many

¹¹ Many of the examples in Pieslak (2007) evince punctuated logic in the music of Swedish metal group Meshuggah and all of these are Platonic-trochaic. Pieslak's Examples 1–4 show cross-rhythms between punctuated irregular patterns in guitars, bass, and kick drum and regular 4/4 patterns in cymbals (and usually snare). Later examples show the same structural logic at higher levels, and Example 18 (240–41) clarifies a doubly punctuated structure: a Platonic-trochaic pattern of (10,10,3) provides the repeating element in the run of a larger pattern of the same type—(23,23)(23,23)(23,13).

Level	<u>Structure</u>		Artist—Song (year)
	Card.	Subdivision	
Metric	10	3/4 (x3), 1/4	Tool—“Jimmy” (1996)
	15	4/4 (x3), 3/4	TTNG—“Gibbon” (2008)
	17	5/4 (x2), 7/4	Tool—“The Grudge” (2001)
	21	4/4 (x3), 5/4	TTNG—“Panda” (2008)
	23	5/4 (x3), 3/4 (x2), 2/4	Muse—“Animals” (2012)
	35	4/4 + 5/4 (x3), 4/4 (x2)	Dream Theater—“The Count of Tuscany” (2009)
	14	5/8 (x2), 2/4	Dream Theater—“A Nightmare to Remember” (2009)
Sub-metric	17	4/4, 2/4, 5/8	Björk—“Crystalline” (2011)
	23	4/4 (x2), 7/8	Dream Theater—“Metropolis Part 1: The Miracle and the Sleeper” (1992)
	25	6/8 (x3), 5/8	Radiohead—“You” (1993)
	25	6/8 (x3), 7/8	Tori Amos—“Spark” (1998)
	26	6/8 (x3), 8/8	Tori Amos—“Carbon” (2002)
	26	5/8 (x4), 3/4	Tori Amos—“Virginia” (2002)
	29	5/8 (x4), 3/4	TTNG—“26 is Dancier than 4” (2008)
Sixteenth-note	29	7/8 (x3), 4/4	Dream Theater—“Scene Six: Home” (1999)
	33	8/8 (tresillo; x3), 9/8	Hail the Sun—“Eight-Ball, Coroner’s Pocket” (2012)
	58	8/8 (x7), 9/8	Tool—“Forty Six & 2” (1996)
	19	19/16 (4/4 + 3/16)	Dream Theater—“Scene Six: Home” (1999)
Sixteenth-note	25	4/4, 9/16	OSI—“Memory Daydream Lapses” (2003)
	34	4/4, 2/4, 5/16 (x2)	Dream Theater—“Metropolis Part 1: The Miracle and the Sleeper” (1992)
	42	5/16 (x7), 7/16	Tool—“The Grudge” (2001)

Table 5.4: List of large-cardinality repeating grooves with punctuated irregularities in the corpus.

factors, including drumbeat, harmonic rhythm, and melodic-motivic grouping. The most common drumbeat patterns from previous sections (kick-snare alternation and undifferentiated articulations) retain the same prominence among these examples.

Because of their familiar Platonic-trochaic organization, punctuated large-cardinality grooves extend the logic of smaller irregular patterns in a relatively straightforward way, as demonstrated by a brief consideration of hypermetric structures. The most common subdivisional structure for punctuated patterns retains the intuitive preference for quadruple hypermeter observed in most Euro-American music, rock and otherwise (see Chapter 1). In large-cardinality irregular grooves, this preference often manifests itself as three measures in the initial meter followed by one in a new meter. This model is evident in the main groove of “Right in Two,” and is the most common structure in the passages in **Table 5.4**. Two variants of this three-plus-one hypermetric

configuration are (1) the seven-plus-one patterning of Tool's "Forty Six & 2" and "The Grudge" (in the 42/16 pattern) and (2) cases in which the comma is better expressed by two measures, as in the metric-level (5,5)(5,6) of Muse's "Animals." Two Dream Theater examples employ the same four-part logic at the hierarchical levels immediately above and below that of hypermeter: an irregular metric pattern in "The Count of Tuscany" spans eight measures with two-measure units grouping quarter notes as (9,9)(9,8), and a sixteenth-note pattern in "Metropolis Part 1: The Miracle and the Sleeper" repeats four super-beats (half-notes or similar) with an (8,8)(8,10) pulse-level. The twenty-three-beat repeating pattern in Tool's "Hooker with a Penis" can also be understood as a four-part structure if parsed (5,5)(5,8). The comma here is substantially expanded and some might prefer a five-measure hypermeasure of (5,5)(5,4,4); however, this latter interpretation is difficult to support because the final eight beats of the cycle subdivide as that most familiar of punctuated structures, the tresillo (3,3,2). The full cycle exhibits a doubly punctuated logic: a run of three five-beat measures leads to an eight-beat comma, which in turn comprises a run of two 3s and a two-beat comma.

Examples that do not follow a four- (or seven-) part structure at any level are in the minority. Three-measure structures occur in only four or five of the listed songs—the main groove of Tool's "Jimmy" being the potential fifth case. Although my (3,3)(3,1) interpretation is supported by the drumbeat in various ways across several formal sections, many listeners will prefer to hear a three-measure (3,3,4) pattern. Adaptations of triple super-meter may be a particular site of experimentation, with two such patterns appearing in the corpus (these numbers are far from conclusive). The passages in question come from Dream Theater's "A Nightmare to Remember," with a (5,5,4) subdivision in eighth notes, and OSI's "Memory Daydream Lapses," the 25/16 groove of which expands a standard-backbeat by a sixteenth in the final beat of each cycle (i.e., (8,8,9)). At lower hierarchical levels we find two five-part subdivisional structures: TTNG's "26 is Dancier than 4," in which four measures of 5/8 are punctuated by one measure of 3/4; and Dream Theater's "Scene Six: Home," in which four beats of four sixteenths each are followed by a fifth beat of only three sixteenths. The structure of the latter groove is most easily counted in a modified 5/4 time, in which the end of each measure has a sixteenth-note deletion.

SPLIT IRREGULARITIES

Large-cardinality repeating patterns with a split structure are less straightforward than those of the punctuated type. Whereas the nature of a punctuated irregular structure is a purely additive one, the

Level	Card.	Structure	Artist—Song (year)
		Subdivision	
<i>Split Singly — Two Near-Balanced Halves</i>			
Metric	14	4/4, 3/4 3/4, 4/4 3/4, 3/4 4/4, 4/4	Of Monsters and Men—“Crystals” (2015) Tool—“Vicarious” (2006)
	15	3/4, 5/4 7/4 7/4 4/4 (x2)	Soundgarden—“Spoonman” (1994) Toadies—“Possum Kingdom” (1994)
	16	4/4, 3/4 4/4, 5/4	TTNG—“Baboon” (2008)
	29	7/4 (x2) 4/4 (x2), 7/4	Fu Manchu—“Pick-Up Summer” (1992)
	12	5/8 7/8	Tool—“Schism” (2001)
	15	7/8 4/4	Tool—“Ticks & Leeches” (2001)
Sub-metric	17	4/4 9/8 (see Exx. 5.9–10)	Hail the Sun—“Eight-Ball, Coroner’s Pocket” (2012)
	18	10/8 8/8 ((3,2)(2,3))(3,2,3)	Dream Theater—“The Count of Tuscany” (2009)
	20	4/4 12/8 9/8 11/8, yet projects half-time (see Ex. 5.11)	Radiohead—“Go to Sleep (Little Man Being Erased)” (2003) Tool—“The Patient” (2001)
	27	13/8 14/8 (6,7)(6,8)	Tori Amos—“Datura” (1999)
	28	13/8 15/8 ((3,3)(3,2,2))((3,3)(3,2,2,2)) 6/8 (x2) 4/4 (x2)	Tool—“Undertow” (1993) Tool—“Schism” (2001)
	29	7/4 15/8 (see Exx. 5.9–10)	Hail the Sun—“Eight-Ball, Coroner’s Pocket” (2012)
Sixteenth-note	54	5/4 (x3) 6/8 (x4)	Queen—“Innuendo” (1991)
	29	13/16 16/16 ((3,3)(3,4))((3,3)(3,3)(4))	Tool—“Intolerance” (1993)
<i>Split Multiply — More Complex Structures</i>			
Metric	22	4/4 (x2) 3/4 (x2) 4/4 (x2) (see Ex. 5.13)	Tori Amos—“Police Me” (2009)
	28	(3/4, 4/4 4/4 [x2]) (3/4 [x2] 4/4, 3/4)	Tori Amos—“Star of Wonder” (2009)
	30	(4/4, 3/4 3/4, 4/4) (4/4, 3/4 3/4, 2/4, 4/4)	TTNG—“26 is Dancier than 4” (2008)
Sub-metric	27	9/8 10/8 8/8	Tool—“Jambi” (2006)
	33	(9/8 6/8) (9/8 9/8)	Dream Theater—“The Count of Tuscany” (2009)
	38	13/8 13/8 12/8	Tori Amos—“Carbon” (2002)
	55	(13/8 15/8) (13/8 14/8)	Tori Amos—“Datura” (1999)
Sixteenth-note	40	4/4 14/16 10/16	Dream Theater—“A Nightmare to Remember” (2009)
	59	(7/8 15/16) (7/8 4/4)	Dream Theater—“The Count of Tuscany” (2009)

Table 5.5: List of large-cardinality repeating grooves with split irregularities in the corpus.

logic of a split structure requires a degree of balance between the subdivided parts, and this is a subjective matter. With some of the shorthand annotations given in **Table 5.5**, it will appear that a

punctuated interpretation is just as valid as my split analysis; in such cases, the particulars of the musical surface are decisive. It is of course impractical to review every listed excerpt in detail—my first transcribed example of split structures sufficiently demonstrates the sorts of criteria that encourage this interpretation. As noted earlier, split subdivisions are perceived more clearly when marked by a change in pulse grouping. Split structures with more than two subdivisions are also easily distinguished from punctuated patterns, though they may create other complications. I have organized **Table 5.5** according to this structural distinction, first listing two-part split structures followed by those with three or more sub-groups. To facilitate this distinction, I have imposed a limit of sixteen pulses for the cardinality of a subdivision. While this limit may seem arbitrary, the number sixteen reflects trends established in previous chapters (see especially **Tables 3.2** and **3.5**).

With a repeating cardinality of twelve, the main groove of Tool’s “Schism” is the shortest split irregularity listed, and it serves as a good introduction to the concept. Given the riff’s (5,7) subdivision, there is no possible arrangement of 2s, 3s, and 4s that allows a punctuated interpretation. As it happens, the surface pattern is (2,3)(2,2,3) (Kick – Snare | Kick – Kick – Snare), which encourages the listener to hear two near-balanced halves through the consistent placement of a three-pulse unit at the end of each group. Note, however, that even were the ordering of one group reversed (e.g., (3,2)(2,2,3)), the result would be a split structure. Of Monsters and Men’s “Crystals” contains a palindromic chorus that exemplifies this sort of structure (refer back to **Ex. 3.20**).

The verse groove of Soundgarden’s “Spoonman” demonstrates a case in which contextual cues are necessary to reinforce a split interpretation (see **Ex. 5.8**). The repeating pattern of fifteen beats could theoretically be parsed as (4,4)(4,3)—a Platonic-trochaic subdivision that readily suggests a punctuated logic—but two features of the arrangement contradict this analysis. The first is the long instrumental pause through the second measure. In the absence of a continuous groove in any part of the rhythm section, the re-entry of these instruments in the third measure of the cycle is strongly marked as a new beginning, establishing a parallel with the first measure. Such parallelisms are frequently the most significant indicators of a split pattern, though they are seldom so clear. The second feature of “Spoonman” that supports a split structure is the (3,2,3) grouping of the first half: the short drum fill marks beat three as closing a measure and the vocal phrasing establishes a more local parallel between the first and sixth beats of the pattern (a transcription in 5/4 + 3/4 would better reflect the structure of the vocals, while my version highlights the drums). Without the

$\text{♩} = 89$

Voice $\frac{3}{4}$ $\frac{5}{4}$ $\frac{7}{4}$ (timing)
 Feel the rhy - thm with your hands Steal the rhy - thm while you can
 ↓ (high crash)

Drums $\frac{3}{4}$ $\frac{5}{4}$ $\frac{7}{4}$

7 $\frac{7}{4}$ $\frac{7}{4}$ $\frac{7}{4}$
 Spoon - man

Example 5.8: A split irregular pattern in the verse of Soundgarden's "Spoonman" (1994).

stability of an ongoing 4/4 meter to connect the first two measures with the third, the punctuated possibility is untenable.

Many of the split structures I have identified establish their subdivision in subtler ways. In Toadies's "Possum Kingdom," articulating a (7,8) split at the metric level, the crash cymbal marks the end of each half of the cycle—the final beat of each 7/4 measure and the final two beats of each pair of 4/4 measures. In Dream Theater's "The Count of Tuscany," an eighteen-pulse sub-metric pattern is clarified as split by a ((3,2)(2,3))(3,2,3) grouping structure; if the three consecutive 5/8 measures were consistently trochaic (3,2) or iambic (2,3), the resulting pattern would be punctuated. Other passages are clearly separable according to surface-level grouping. An example is Radiohead's "Go to Sleep (Little Man Being Erased)," in which measures of 4/4 alternate with measures of 12/8 through a pulse-retaining metric modulation (i.e., the eighth note remains constant).¹²

The same contrast of simple and compound time signatures relates two sections of a through-composed form in Hail the Sun's "Eight-Ball, Coroner's Pocket" (see **Ex. 5.9**). The first passage is the simpler of two, with a (4/4 + 9/8) structure that closely resembles that of the Radiohead example. While the second is more unusual, the principle by which it is ordered is the same: seven beats of simple time alternate with five of compound time.¹³ With a cardinality as large as this

¹² For a more detailed analysis of this example, see Osborn (2017, 66–68).

¹³ An alternate reading arises if the measure I have notated in 5/8 is perceived as a truncated measure of 3/4: the result comprises eight-and-a-half beats of simple time and four of compound time.

1 = 108

Voice Drums

so what? screamed
Be - cause it

Now what? is an axe

49

1 = 172

Guitar

Dmaj7

101 Bm⁹

Just get a script Some - - one

(3rd x snare continues with same rhythm as guitar)

guitar continues as before; bass enters with same rhythm (on B₂)

106

Dmaj7

Needs me - di cine Si - lenced

x3

Example 5.9: Two formal sections related by split irregular structures in Hail the Sun's "Eight-Ball, Coroner's Pocket" (2012).

(twenty-nine eighth notes), there are many ways to subdivide and thus many series of time signatures fit the music appropriately. My transcription parses the cycle as two measures of 3/4, one of 5/8, and two of 6/8, aligning the downbeat of the fourth measure with an emphatic accent in the drum

and bass on the first pass and with subsequent vocal cues. The alignment of vocals and hypermetric structure draws our attention to another shared feature of the two passages in question: a regular alternation of two vocal ideas per cycle. Specifically, a repeated falling third motive is common to the vocals of both sections, though it migrates from the first half of each cycle in the former passage (beginning with the lyrics “So what?”) to the second half in the latter (“Someone”).¹⁴ A shift in tempo between the two sections offsets the change in note duration, with the effect that the time spanned by the vocal motive is relatively consistent: the discrepancy between the earlier half-note rate of 54 bpm and the later dotted-half-note of 57 bpm is negligible. This tempo relationship also means that a full cycle of either groove spans approximately the same real-time duration—about five seconds.

Despite their many commonalities, the two passages of “Eight-Ball, Coroner’s Pocket” differ subtly with regard to the alignment of hypermeter, vocals, and surface grouping (the last of these is illustrated in **Ex. 5.10**, below). In the earlier pattern, split structure is marked simultaneously by changes in all three musical parameters: 4/4 gives way to 9/8, simple grouping shifts to compound, and sung vocals alternate with screamed fragments. In the later pattern, the misalignment of vocals and surface grouping complicates metric understanding and contributes to the complexity of the already exceptional twenty-nine-eighth-note split structure. As noted, the transcribed five-measure interpretation aligns vocals with hypermeter. The chief alternative to that parsing is given in **Example 5.10** (and **Table 5.5**)—a starker two-measure idea of 7/4 + 15/8—which has the benefit of coordinating hypermeter with the split surface groupings. Though it is perhaps unintuitive at first glance, the two-measure version reveals yet another similarity with the earlier (4/4 + 9/8) pattern: the second half of each pattern is exactly one eighth note longer than the first half, bringing both split structures as near to balanced as possible without dividing the cycle exactly in two.¹⁵ The substantial structural difference between the two interpretations given for the second groove, as denoted by their respective time signatures, is possible because of the undifferentiated drumbeat of the passage. The alternation of kick and snare in the earlier groove does not allow any such ambiguity.

¹⁴ The lyrics of the two passages are further related through consonance and assonance, as is apparent in the listening examples.

¹⁵ In a pattern with two exact halves (e.g., 6/4 + 12/8), the shift from simple to compound time could be interpreted as a cross-rhythm. It may be that Hail the Sun avoid such a structure in order to necessitate a change of tactus for the listener, which in turn evokes a sense of discomfort that reflects the song’s subject matter (a doctor addicted to pharmaceuticals).

The musical score consists of two staves. The top staff shows a drum pattern with various strokes (x, -) and rests. Above the staff, brackets group the notes into patterns of 2, 2, 2, 2, 3, 3, and 3. The bottom staff shows a similar pattern with different note heads and rests. Brackets above the staff group the notes into patterns of 2, 2, 2, 2, 2, 3, 3, 3, and 3.

Example 5.10: Annotation of the drumbeats from the previous example, showing related subdvisional structures.

The musical score compares two instruments: Electric guitar and Drums. The Electric guitar staff is in 9/8 time, playing chords F⁵, D⁵, G⁵, A⁵, B_b⁵, A⁵, and D⁵. The Drums staff is in 8/8 time. The guitar part is labeled "doubled by bass 8vb". The drum part includes a "fill varied" section. The tempo is indicated as ♩ = 222.

Example 5.11: A synthesis of half-time groove and split irregularity in Tool's "The Patient" (2001).

My last example of a singly split structure comes from the prechorus of Tool's "The Patient" (see **Ex. 5.11**). The pattern articulated by the kick and snare drums joins the half-time feel evoked in earlier sections (cf. **Exx. 3.21** and **4.7**) with an eighth-note structure split into two odd-cardinality halves (of nine and eleven pulses). Of central importance to this interpretation is the repetition of a Kick [dotted-quarter] – Kick [eighth] – Snare succession, beginning on the downbeats of both the 9/8 and 11/8 measures. The same pattern is familiar from the song's other half-time grooves, where it is always aligned with a consistent quarter-note pulse; the prechorus is the only section in which this rhythmic cell is displaced by an eighth note. This already complex metric situation is further destabilized by the absence of the snare in the first measure of 11/8. Because most of the song has been in a quintuple pattern (and those passages that do not retain the idea of five as a cross-rhythm), another possible interpretation parses the prechorus in 5/2 time. My split interpretation foregrounds the (3,3,3) cross-rhythm in the guitar and bass as well as the drum fills that mark the

[Audio only]

Example 5.12: A four-part split pattern in Tori Amos's "Datura" (1999).

end of each measure (a two-eighth-note extension every second measure marks the difference between 9/8 and 11/8 halves).

Once one accepts the unusually large cardinalities involved, most of the multiply split structures in **Table 5.5** are relatively straightforward. Five of the nine passages exhibit a four-part structure that can be understood as a singly split pattern in which each half is itself split. Tori Amos's "Datura" is an instructive example, close reading of which reveals a common pattern found in many Amos examples in this chapter—a predilection for semi-regular expansions within 6/8 metric contexts (see **Ex. 5.12**).¹⁶ In "Datura," an eight-measure repeating cycle, spanning 24 seconds per repeat, is structured as four two-measure units, each beginning with a measure of 6/8 and varying the second. One level higher, the second of every four measures is in 7/8 time and the fourth alternates between 9/8 and 8/8. Thus the structure of one full cycle is ((6,7)(6,9))((6,7)(6,8)). The constantly shifting metric fabric is stabilized by two features: (1) a clear snare articulation on the fourth eighth-note of every measure (marking metric continuation), and (2) a recurring harmonic progression in which one-and-a-half measures of B♭ major are punctuated by D♭ major and A♭ major in the part of the groove with varying length.

"Police Me," another Amos song, contains a far more difficult split irregularity, complicated by repeated displacements in both the drumbeat and the harmonic rhythm (see **Ex. 5.13**). The six measures transcribed are repeated three-and-a half times, including the vocals, with minimal variations: the first A♭-major chord is replaced by the parallel minor harmony on the third pass and the drum fill is predictably unpredictable. Apart from the superstructure of a repeating twenty-two-beat pattern, elements of regularity are scarce. On the one hand, the harmonic alternation between tonic and minor-dominant in A♭ mixolydian suggests a cycle of three two-measure groups. The two-beat extension on the subdominant simultaneously clarifies matters by marking the end of the cycle, and obfuscates the boundary of the pattern by displacing the hypermetric downbeat—this displacement is the central issue in the passage. On the other hand, the resulting (9,5)(6,9)(5,6,4) harmonic rhythm at the eighth-note level is erratic. The pattern makes more sense if grouped in two

¹⁶ Other songs that exhibit this idiosyncrasy include "Carbon," "Spark," "Virginia," and "Barons of Suburbia."

$\text{♩} = 118$

The musical score consists of two staves. The top staff is for the Voice, starting with a melodic line in 4/4 time. The lyrics are: "Load - ed full of win - ter you are". The chords are N.C. (D♭), A♭, E♭m, and A♭. The bottom staff is for the Drums, also in 4/4 time. The lyrics are: "riveted ride". The drums play a pattern of eighth and sixteenth notes. The tempo is indicated as $\text{♩} = 118$.

The second section of the score begins with a melodic line in 4/4 time. The lyrics are: "stor - ming Black-ber - ry girl will you strike be - fore he's". The chords are E♭m, A♭, E♭m, and D♭. The drums continue their rhythmic pattern below.

Example 5.13: A highly ambiguous split pattern in Tori Amos’s “Police Me” (2009).

parts, as $(9,5,6)(9,5,6,4)$.¹⁷ The fragmentary nature of the lyrics does little to clarify the phrase structure. For example, the line “will you strike before he’s loaded” is the longest span that seems connected, and this crosses the hypermetric boundary, further obscuring the structure of the cycle. An additional complication is raised if “storming” is heard as expanding the second of three phrases, suggesting a third possible phrase structure: $(3,4)(3,3,4)(3,2)$ at the quarter-note level.

Many of the complications encountered in the harmony and vocals of “Police Me” are echoed in the song’s drumbeat. The displacement of the first downbeat forward by a beat receives support in the form of a snare on beat one and kick on beat two. Ambiguity persists concerning the phrase structure of the cycle. From the two-part perspective, the displaced first beat allows a structure of $(3,4,3)(3,4,5)$, with the extension in the final two beats again crossing the hyper-bar line. One three-part view accords with the notated $(4,4)(3,3)(4,4)$ subdivision. The final possibility—the one with an expanded second phrase—is the most asymmetrical of the three, but it is recommended by the similarity of drumbeat in the first two phrases. In both, an initial measure of deferred-continuation triple meter (or two such measures in phrase two) leads to a double-continuation tresillo (the second and fifth notated measures). Ultimately, the interpretation preferred by a given listener may be rooted in their inclination to hear the hypermetric downbeat as either displaced (retaining the

¹⁷ Melodically, the first three measures are transposed up a tone nearly exactly in the second half, lending credence to the two-part reading.

transcribed meter at a deeper level) or overwritten entirely. The most radical listener may very well understand the shift as occurring immediately, extending the previous section of the song by a quarter note to allow the adjustment.¹⁸

AMBIGUOUS AND MIXED SITUATIONS

A small number of passages are difficult to reconcile fully with the additive logics of either the punctuated or split types. **Table 5.6** catalogues seven such examples from the corpus; for the most part these cases are ambiguous, but at least one of the seven combines clear expressions of punctuated and split logics at different hierarchical levels. The song in question is Radiohead’s “Paranoid Android,” in which four-measure spans of 4/4 alternate with four-measure spans of 7/8 (a split, eight-measure cycle), but in which the final measure of each 7/8 section is extended, yielding a 4/4 measure (a punctuated structure of (7,7)(7,8); this second half of the larger, sixty-one-eighth-note cycle is given in **Ex. 4.16**). Regarding the “ambiguous” designation of the other six examples, these passages are the most difficult to place in either the punctuated or split category, and since these distinctions fall along a continuum, there is a second level of ambiguity associated with the very act of categorization. For instance, each of the two halves of the repeating irregularity in Amos’s “Star of Wonder” could be understood as punctuated irregularities, though I prefer to understand them as split (see **Table 5.5**).¹⁹

The structure of a 15/8 passage from Dream Theater’s “The Count of Tuscany” offers another example of ambiguity between punctuated and split. At the eighth-note level, the passage exhibits a succession of (3,3,3,2,2,2); I refrain from suggesting a subdivision with bracketing so as to avoid prejudicing the reader in favour of either interpretation. The addition or subtraction of either a three-eighth unit (in the run) or of a two-eighth unit (in the comma) would be decisive, but, as it stands, the succession falls exactly midway between clear split and punctuated structures. For example, (3,3)(2,2,2) yields a split pattern with two symmetrical halves, whereas (3,3)(3,3)(2,2,2) is a punctuated structure—two measures of 6/8 punctuated by a third measure in 3/4. If the ambiguous succession in “The Count of Tuscany” is understood to comprise three beats in compound time and

¹⁸ I consider such a reading unintuitive because the previous section is in a secure 4/4 meter with a half-time drumbeat, which creates a strong expectation for the initial downbeat of the irregular passage. In my own listening, if my perception of the hyper-downbeat shifts, it is only when the cycle repeats.

¹⁹ The former half would nest a single 3/4 measure within a predominantly 4/4 span; in the latter the roles of the same two meters are inverted and their ordering altered.

Level	Structure		Artist—Song (year)
	Card.	Subdivision	
Metric	40	6/4 (x3); 6/4, 4/4; 6/4 (x2)	Radiohead—“The Tourist” (1997)
	14	8/8, 6/8	Tool—“Schism” (2001)
	15	9/8, 3/4	Dream Theater—“The Count of Tuscany” (2009)
	17	((2,2)(2,2))((3,2)(2,2)) in synth	Björk—“Hollow” (2011)
	23	4/4, 9/8, 6/8	TTNG—“Baboon” (2008)
	27	3/4, 7/8, 3/4, 4/4	Better than Ezra—“King of New Orleans” (1996)
	61	4/4 (x4) 7/8 (x3), 4/4	Radiohead—“Paranoid Android” (1997)

Table 5.6: List of large-cardinality repeating grooves with ambiguous subdivisional strategies in the corpus.

[Audio only]

Example 5.14: Conflicting cues between meter and guitar part in Better than Ezra’s “King of New Orleans” (1996).

[Audio only]

Example 5.15: Vague metric suggestions in Björk’s “Hollow” (2011).

three in simple time, a split reading arises. If, instead, the comma is parsed as an expanded fourth beat in which each of three eighth notes is doubled in duration, then the 3/4 measure can be seen as punctuating a predominantly 3/8 meter. The ambiguity of many cases listed in **Table 5.6** follows this same logic, in which a groove falls close to halfway between two less ambiguous patterns. The forty-beat pattern that characterizes much of Radiohead’s “The Tourist” is somewhat different, placing a single measure of 4/4 two thirds of the way through a cycle that is otherwise in 6/4. The additive logic is very nearly punctuated, but the fact that the exceptional measure does not come at the end of the cycle distinguishes it from the examples in **Table 5.4**.

Two further examples exhibit ambiguity through contextual cues, or the absence thereof. Presented in **Example 5.14**, a short instrumental passage in Better than Ezra’s “King of New Orleans” comprises a split structure from a purely metric perspective: (3/4, 7/8) | (3/4, 4/4). This structure is undermined by elements of composition and production when three repetitions of essentially the same guitar riff are followed in the fourth measure by a shift to a chordal texture. Difficulties also arise at the end of Björk’s “Hollow,” which comprises a cycle of seventeen eighth notes without any clear subdivisional structure (see **Ex. 5.15**). The drumbeat consists of no more than repeating, undifferentiated kick articulations and the harmonic structure of the synth is barely



Figure 5.1: Reproduction of Osborn 2017, Figure 3.16, showing a non-isochronous sub-beat in Radiohead’s “Bloom” (2011).



Example 5.16: Transcription of the non-isochronous rhythm in Radiohead’s “Bloom” (2011).

clearer. The $((2,2)(2,2))((3,2)(2,2))$ subdivision I offer in **Table 5.6** is neither obvious, nor entirely consistent. Ultimately, I contend that the passage is not even ambiguous—it is vague.

One final example of repeating irregularity not featured in the tables above merits discussion. The irregularity in Radiohead’s “Bloom” is essentially unrelated to anything I have discussed up to this point; it is unique within the corpus, specifically, and exceedingly rare in rock music more generally. **Figure 5.1** reproduces Osborn’s (2017, 78) transcription of the groove, which persists throughout the song. In Osborn’s interpretation, the rhythmic succession approximates a pair of quarter-note triplets, some members of which are “displaced . . . by a rhythmic interval impractical to notate by conventional standards.” My transcription attempts to notate this impractical interval, and the result is admittedly somewhat cumbersome (see **Ex. 5.16**; my formatting follows Osborn for ease of comparison). Full subdivision at the septuplet level on the part of the performer (drummer Philip Selway) is impractical as it violates the 100 ms limit for rhythm production (see London 2012, 28–38); a non-isochronous interpretation of this succession is the most reasonable (as implied by Osborn). Nevertheless, my transcription illustrates an important point: the rhythm of “Bloom” can be expressed as a large-cardinality irregularity, rather than as a scumbled version of a triplet rhythm.²⁰

²⁰ I say “large-cardinality” here rather than septuplet because the prevailing repeating pattern spans the half note as a quattuordecuplet with $(5,5,4)$ subdivision. I do, however, employ septuplets in much of what follows as it allows easier comparison between several of the articulated time points.

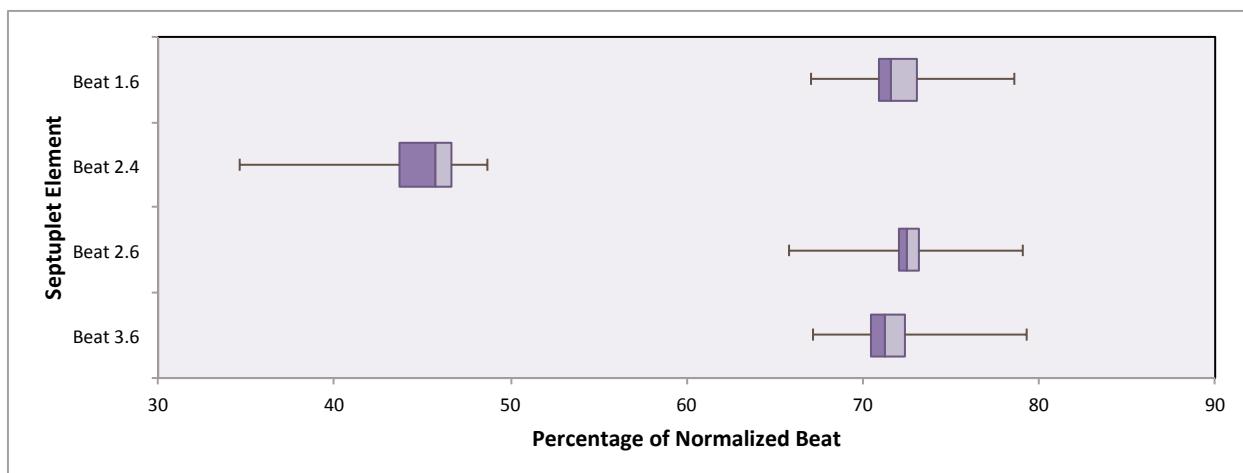


Figure 5.2: Boxplot of average timing ratios for snare articulations in Radiohead’s “Bloom” (2011).

There are at least two reasons we might consider expressing the rhythm in these terms. The first concerns the compositional lineage on which Radiohead draws. This is an admittedly speculative consideration, but not irrelevant to understanding the stylistic competencies of rock musicians (and listeners). As Osborn observes on several occasions, Radiohead’s lead guitarist and keyboardist Jonny Greenwood is an experienced orchestral composer with an affinity for mid-twentieth-century repertoire, most notably Messiaen and Penderecki.²¹ My representation of the rhythm from “Bloom” employs notation that one might find in a score of Messiaen’s or one of his contemporaries, whereas Osborn’s is more redolent of the sort of non-isochrony encountered in, for instance, Mandé drumming—a repertoire with which Radiohead may or may not be familiar (see Polak and London, 2014, on whose work I draw further below).

The second factor that supports my transcription is the accuracy with which it represents the rhythm in question. **Figure 5.2** consists of a boxplot showing the placement of non-isochronous snare articulations in the main drumbeat of “Bloom” (the second shown in **Fig. 5.1** and **Ex. 5.16**): horizontal lines give the full range of articulations recorded; boxes emphasize medians and interquartile ranges (IQR; i.e., the range between the twenty-fifth and seventy-fifth percentiles).²² The numbers following the decimal point in vertical-axis item names denote the position within the septuplet occupied by each articulation. The sixth septuplet member is articulated in all of the first

²¹ See Osborn (2017; 48, 61, and 120). See also, for example, Greenwood’s use of graphic notation strategies, as in his score for “Oak Leaf 1,” reproduced at <https://soundmerit.com/2017/06/04/57/> (accessed November 15, 2017).

²² These data come from my analysis of the CD recording of “Bloom” using ProTools. I created a tempo map, accurate to the half-note level, and identified the positions of snare-drum transients in relation to this map. My presentation of the results follows Polak and London (2014; e.g., Figs. 4.1–4.5), but inverts the axes to show microtiming along the vertical axis.

three beats of each measure, while the fourth is articulated only in beat two. The on-beat articulation of beat three is not represented here because my data suggested no relevant displacement of this metric position (*pace* Osborn; cf. **Fig. 5.1**).

Before interpreting the data of **Figure 5.2**, it is useful to consider the values we might expect for various rhythmic profiles, including both the quarter-note triplets approximated by Osborn and my septuplets.²³ We can scaffold our understanding of the irregularity in “Bloom” by comparison to two common beat subdivisions, the sixteenth note (.25, .5, and .75 of the beat) and the triplet (.333, and .667). An exact quarter-note triplet would articulate .667 of the first (quarter-note) beat and .333 of the second. We would thus expect the fourth and sixth septuplet positions (those transcribed in **Ex. 5.16**) to fall at .429 and .714: the first of these values is about halfway between the triplet .333 and the even-eighth-note .5, and the second is about halfway between .667 and .75 (with the latter delta half the size of the former).

Most of the data from “Bloom” come remarkably close to these expected positions. The average positions of sixth-septuplet articulations are .717, .725, and .712, respectively, with an overall median of .720. The median for second-beat, fourth-septuplet articulations is .458, straying somewhat farther from the expected position (though even this discrepancy amounts to less than 12 ms). The slightly later average timing of the second articulation within beat two corresponds to the lateness of the first. The consistency of these timing measurements with expected values is supported by a comparison to Polak and London’s (2014) data on Mande drum ensembles (whose precision in articulating non-isochronous successions is praised by the authors). The average range expressed by Selway in articulating the septuplet rhythm (.128 of a beat) is comparable to the (least precise) student ensemble surveyed by Polak and London, but the IQRs of Selway’s performance (averaging .021) are consistent with the professional Mande ensembles.²⁴ The accuracy with which the rhythm of “Bloom” evokes a large-cardinality irregularity at the musical surface is striking, especially since experimentation of this sort, and at this shallow hierarchical level, is unparalleled in the corpus.

²³ Much of this discussion rehearses Osborn (2017, 78–79), with the minor difference that I assign values as one-thousandths of the beat where he deals in one-thousandths of the half note.

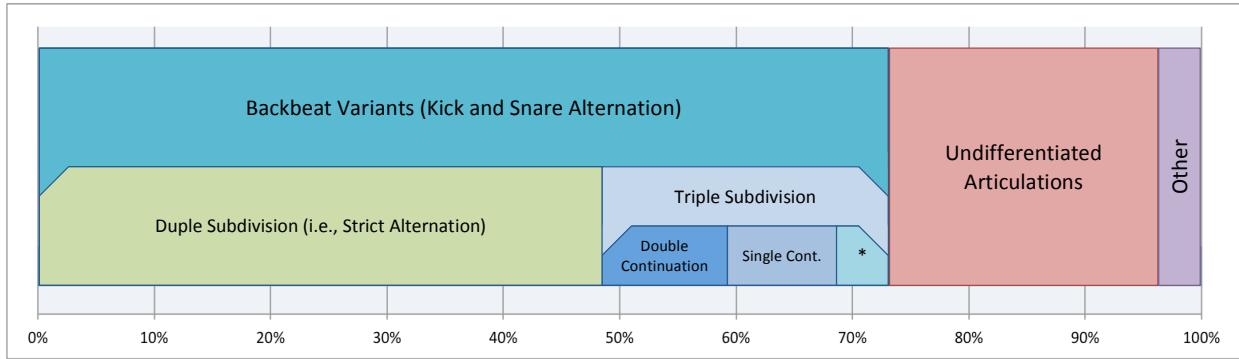
²⁴ Moreover, because the tempo of “Bloom” (150 bpm) is slightly faster than those of the Mande performances in question, a measurement given in milliseconds, rather than beat quantiles, would only emphasize Selway’s accuracy.

Summary of Repeating Irregular Patterns

The tables and examples of the past three chapters serve as a catalogue of drumbeat practice outside of the standard rock beat, from historically regular meters and the genre-transcending tresillo family, through the most representative irregular meters—the diversity of quintuple patterns and the consistent deletions of septuple structures—and, finally, to the punctuated and split models I offer for generalizing among large irregular cardinalities. Through a multitude of metric spaces, two features stand out for their consistency and adaptability. The first concerns the ordering of quasi-metric (non-isochronous) successions, which show a marked preference for Platonic-trochaic organization. The absence of Platonic-trochaic organization in the subdivisions of longer patterns is not uncommon, but this is usually because of a higher-level Platonic-trochaic structure, typically spanning the repeating cycle in its entirety.

The second feature that remains generally consistent across all sorts of metric contexts is drumbeat practice, summarized in **Figure 5.3**. Variants of the standard backbeat account for a majority of the drumbeats we have seen. The closest relatives of the backbeat, in which duple subdivision is expressed by a consistent alternation of kick and snare, characterize nearly half of the analyzed passages. Within triple contexts, including triple meters, tresillo patterns, and the triple elements of more complex grooves, single- and double-continuation types are about equally common, while deferred continuations occur with less frequency. About a quarter of the repeating patterns surveyed are marked by undifferentiated articulations; in a small number of undifferentiated examples, the primary metric cue is not the drums but another instrument (usually bass or guitar), and these cases are not tallied in the figure. The “Other” category includes soloistic drum parts and underdetermined subdivisions.

The percentages observed for the corpus as a whole are a good representation of each distinct metric archetype or cardinality. For example, quintuple patterns—the most varied subset of repeating patterns—closely mirror the breakdown shown in **Figure 5.3** in every respect. Some patterns, however, are distinguished from the aggregate in idiosyncratic ways. The most dramatic of these is the prevalence of duple backbeat variants among super-metric patterns, where they account for 85% of examples. Because of this trend, I considered super-metric pattern as a cohesive group, regardless of cardinality. Septuple patterns also comprise a disproportionate number of duple backbeat examples (68%), demonstrating the influence of 4/4 time as a model for these grooves. Finally, tresillo, nonuple, and undecuple patterns contain the largest share of undifferentiated



* Deferred continuation.

Figure 5.3: Summary of drumbeat types in the repeating grooves of the corpus.

drumbeat patterns (around 40% each), most of which occur in longer repeating cycles (compound tresillos, 9/4, and 11/4).

Whereas I have engaged in deeper consideration of cardinal and sectional irregularities (types 1 and 2) in Part II, isolated (type-3) irregularities serve as the point of departure in Part III. In Chapter 6, I review the most common locations for such irregularities, within both song sections and the larger form of complete songs, and I explore the interaction of isolated irregularities with cardinal or sectional types. Taken together, Part II and Chapter 6 prefigure the analysis of full songs in Chapter 7. With a fully elaborated method in hand, these final examples simultaneously mobilize the specific ideas articulated in earlier chapters and illustrate the general value of the corpus in informing analysis.

Part III

Beyond Groove: Non-repeating Types and Full-Song Analyses

The repeating irregularities discussed in Chapters 3–5 of this dissertation contribute to the artistry of their parent songs by establishing a baseline level of metric salience. No irregular groove can be entirely unmarked, given its avoidance of a normative 4/4 pattern; likewise, no such groove defies comprehensibility altogether, since the repetition of even the most complex of structures affords some degree of familiarity. In this final section of the dissertation, I explore metric irregularities that exemplify marked events: namely, isolated and inconsistent types. Both types define sonic events that direct listeners’ attention, either by interrupting, re-routing, or otherwise complicating the flow of an existing groove, or by avoiding the establishment of such a groove in the first place. In a genre steeped in repetition—in the form of grooves, vamps, and looped chord progressions—these irregular types break the mold, introducing unique temporal events and passages of metric through-composition.¹

I begin in Chapter 6 with observations of a general nature, establishing trends among the hundreds of instances of isolated irregularity in the corpus. In many ways, the form of these irregularities follows its interruptive function. While consistent trends in metric context, formal placement, and instrumentation prove elusive, isolated irregularities fall disproportionately at or towards the ends of phrases, where they reinforce formal boundaries. This overview leads me to theorize a specific sub-type of isolated irregularity: *metric pivots* are phrase overlaps that smooth irregular transitions between grooves. The chapter closes with a discussion of inconsistent irregular passages—formal sections characterized by their avoidance of metric predictability or consistent

¹ The most complex of these structures can at times recall Horlacher’s (2011, 27) notion of *ordered succession*.

patterning. Chapter 6 concludes my theorization of the structural features of each irregular type (as laid out in Chapter 2) and their associated drumbeat practices.

In Chapter 7, I mobilize the theoretical findings of my corpus study in three analytical vignettes, one by each of the core artists. Tool’s “Schism” is one of the most metrically irregular songs in the corpus, featuring many distinct irregular grooves (including several of the *split* type), isolated irregularities (including a metric pivot), and a passage that borders on metric inconsistency. Radiohead’s “Decks Dark” shows the band expanding their metric explorations in their newest release; this vignette reinforces the impact that knowledge of a band’s compositional idiolect can have on analysis. Finally, Tori Amos’s “Icicle” exemplifies the subtleties of metric irregularity in the absence of drums, which in turn affirms their importance in determining metric structure.

— 6 —

Shifting Structures: Isolated and Inconsistent Types

In this chapter, I consider irregularities that cannot be understood within any larger, cyclic pattern. Most of these examples concern only a single measure, which truncates, extends, or otherwise interrupts an ongoing groove. Other cases implicate an entire formal section that never settles into a discernible pattern. As in earlier chapters, my focus in the discussion that follows is by turns theoretical (are there generalizable features shared by most or many irregularities?) and analytical (what unique irregular features do we find in recorded songs?). As a result, the first section of this chapter, on isolated metric irregularities (type 3), comprises two parts—the first is a top-down, data-driven overview of eight different parameters that inform my understanding of these highly varied irregularities, the second delves into ambiguous and distinctive examples. Similarly, the second large section begins with a short theoretical introduction before shifting focus to analysis; it centers on the rare examples of inconsistent irregularity (type 4) found in only thirteen songs in the corpus. These passages can be bewildering on first hearing and, even with repeated exposure, the logic behind their metric manipulations often requires that we zoom out, understanding them within a broader context of a section or full song.

Isolated Irregularities

As defined in Chapter 2, an isolated metric irregularity (IMI, hereafter) occurs when a song, or a section thereof, is predominantly in one meter but contains at least one (isolated) measure better understood in a different meter. The corpus contains 381 instances of this type of irregularity among 170 songs. These cases comprise many diverse metric situations, including intersections with cardinal and sectional irregularities. Consistent trends thus prove elusive. For example, because they interrupt the otherwise continuous flow of a (usually regular and entrainable) groove, all of these IMIs might be expected to have some sort of disruptive impact; in practice, however, most are mild enough to go largely unnoticed in casual listening. Even among more demanding cases (from the perspective of a performer or analyst), not all serve a disruptive function; in fact, some do exactly the opposite, bridging a gulf between two otherwise distantly related meters. The dominant trend

that emerges, both in my parametric overview and in discussion of individual examples, is that IMIs account for an abundant variety of metric structures and expressive functions.

PARAMETRIC TRENDS

My analysis of IMIs in songs of the corpus tracked eight parameters that I expected to either demonstrate a generalizable feature of these irregularities, or else to relate in meaningful ways to one another. The parameters in question are as follows:

- Artist or source: Amos, Radiohead, Tool, *Billboard* charts, or *Wikipedia* lists
- Metric context: how does the irregular measure relate to the surrounding measures?
- Drum-part strategies: do the drums play a beat or a fill, or do they drop out of the texture?
- Position within song: measured as a percentile of the song's duration
- Formal function: in what section does the IMI occur? (verse, chorus, etc.)
- Intraformal position: where within that section is the irregularity?
- Uniqueness: is the IMI repeated or unique?
- Interaction with vocals: are vocals present, absent, partial, or impending?

Other factors could be considered as well, including a more detailed description of instrumentation, arrangement, and production techniques, or some expression of harmonic function. However, I limited my analysis because the complexity of the data collected is considerable without adding further dimensions. My analyses highlight interactions between metric irregularity, specific performing forces (drums and vocals), and musical form.

All of the parameters tracked shed light on the nature of isolated irregularity in this repertoire, though some offer more robust trends than others. For example, the intraformal placement of most IMIs is very consistent, falling at or towards the end of a phrase or section (more on this below). Conversely, trends like the placement of IMIs within a full song or comparison of unique and repeated irregularities yield data that are only useful in conjunction with other parameters. The simplest figures are the number of examples found in the work of each core artist. Nearly a quarter of the IMIs in question (eighty-nine of 381) come from the songs of Tori Amos; Amos not only demonstrates a clear affinity for isolated irregularities, but also handles them in especially idiosyncratic ways. Tool contributes roughly half as many (forty-seven), while Radiohead rarely engages with metric irregularity in this way (their recordings contain thirteen IMIs). Because of

Radiohead's apparent preference for groove-based irregularities, the role of their music in this chapter is more restricted.

After outlining broad trends among different metric contexts, including the proclivities of the three core artists, I introduce a framework for categorizing drumming strategies, review the most striking formal and intraformal features, and consider the impact of vocal participation.

Metric Context

Understanding the context in which an IMI occurs is essential to understanding the impact of the irregularity to a listener. In many cases the ongoing groove might stretch to accommodate a metric anomaly. Other times, the presence of an IMI requires that we recalibrate our entrained model of the meter at hand. The available relationships between IMI and surrounding groove yield an impressive variety of metric combinations, which I classify below according to five categories.

Table 6.1 gives a sense of the sheer variety of examples. Over fifty distinct metric combinations occur within more than twelve different contexts despite efforts to group similar cases together (e.g., 3/4 and 7/4 IMIs in a 4/4 groove are essentially the same). Further complicating matters, in one fifth of these examples an IMI facilitates a transition from one meter to another. (Because such cases are found exclusively at the boundaries of a phrase or formal section, the contexts recorded in **Table 6.1** give the prevailing meter of the parent phrase.) As my ordering in the table makes clear, the most common contexts for IMIs are also the most common meters in rock music in general. Relative to what we might expect, 5/4 meters stand out for their prevalence and 3/4 for their paucity.¹ As for the different types of IMIs, very few occur with much frequency; most combinations occur only once, or several times but within a single song.

Grouping these disparate examples requires that we consider trends within and across shared metric contexts. For example, most IMIs share the same tactus and pulse as their parent metric context. Attending to apparent differences in beat value between IMI and context reinforces the close relationship between 7/8 and 4/4 meters (see Chapter 4). Each combination involving the two meters boasts seven examples, far more than any other pairing that necessitates a change of tactus. Exceptional cases often belong to highly complex passages. A good example is the lone instance of a 7/16 IMI in a 3/2 context (itself comprising only two cycles), which comes from the extended

¹ Unlike other trends involving triple meters noted in earlier chapters, this observation is not skewed by the criteria used to compile the corpus. While songs that remain in 3/4 from start to end were not selected, any song featuring an IMI within a 3/4 context (or, for that matter, any 3/4 IMI within another metric context) was included in the sample.

Metric Context	Irregular Measure(s)		Frequency Within Corpus	Notes
4/4	2/4 or 3/2*	223	166	Most common by far; normative
	3/4 or 7/4		21	Common
	5/4		18	Common
	7/8		7	Uncommon
	2/4 + 5/8 (tempo change)		4	Unique to one song See Ex. 2.5
	6/8		2	Rare
	6/16		2	Unique to one song
	7/4 + 7/8		2	Unique to one song
	9/8		1	Unique
6/8	3/8 or 9/8	23	10	Uncommon
	7/8		7	Uncommon
	4/4 (or 8/8, or 1/4)		5	Uncommon
	5/4		1	Unique
5/4	6/4 or 3/4 x2	22	15	Common
	4/4		2	Rare
	6/4 + 12/8		2	Unique to one song
	4/4 x2		1	Unique
	7/4		1	Unique
	7/8		1	Unique
7/4	4/4	16	11	Uncommon
	4/4 x2		5	Rare
3/4	4/4	16	6	Uncommon
	4/4 x2		6	Uncommon
	9/8		2	Unique to one song
	5/4		1	Unique
	7/8		1	Unique
3/2*	4/4	13	4	Uncommon
	2/4 or 4/4 x2		4	Uncommon
	7/4		3	Unique to one song
	11/8		1	Unique
	7/16		1	Unique
7/8	4/4	8	7	Uncommon
	11/8		1	Unique
9/8	11/8	8	5	Rare
	8/8		1	Unique
	10/8		1	Unique
	14/8		1	Unique

Table 6.1: List of isolated metric irregularities in the corpus, showing metric context and meter of irregularity, ordered by frequency.

	14/8		2	Rare	
	12/8		2	Unique to one song	
13/8	4/4	7	1	Unique	
	15/8		1	Unique	
	16/8		1	Unique	
11/8	12/8	6	4	Rare	
	9/8		2	Unique to one song	
5/2*	3/2*		2	Rare	
	4/4	4	1	Unique	
	4/4 x2		1	Unique	
9/2*	4/4	4	2	Unique to one song	
	4/4 x4 (or 8/2*)		2	Unique to one song	
Other combinations		31	1–2, each	Unique or unique to song	See Exx. 6.10 and 6.14

* Apparent half-note time signatures denote super-metric patterns and IMIs. Most of the corresponding examples suggest a quarter-note tactus.

Table 6.1: List of isolated metric irregularities in the corpus, continued.

The musical score consists of two staves. The top staff is for "Electric guitar" and the bottom staff is for "Drums". The tempo is indicated as $\text{♩} = 128$. The key signature is B-flat major. The time signature starts at 4/4, changes to 3/2, then 7/16, then back to 4/4. The electric guitar part features eighth-note patterns. The drums part is labeled "'Max Stax'" and shows a pattern of eighth notes and sixteenth notes. Measure numbers 3 and 290 are indicated above the staves.

* Max Stax is the name of a set of Sabian cymbal products, developed in collaboration with former Dream Theater drummer Mike Portnoy. The “effect” cymbal, as it is identified on Sabian’s website, consists of two cymbals—a China atop a crash or splash. The sonic result is similar to that of semi-closed hi-hats, but less focused or what drummers might call “trashier.”

Example 6.1: A short 3/2 groove extended by a 7/16 IMI in Dream Theater’s “Home” (1999).

instrumental ending of Dream Theater's "Home" (see **Ex. 6.1**). The passage can be subdivided in at least three ways. The first, given by the time signatures of my transcription, shows a preference for 4/4 time whenever possible. Local snare syncopations in the first and third measures are understood as single-continuation tresillo successions. The first phrase ends a half-note early, clarified by the onset of the second; the second phrase ends a sixteenth-note early with a shift back to an earlier riff. The second possible subdivision, represented by the annotation immediately above the staff, shows a preference for triple meter (3,3)(3,2,2 $\frac{3}{4}$). The first and third measures are syncopated, while the intervening measure gives a deferred continuation. The fourth measure is expanded, first to four beats through a backbeat alternation of kick and snare, then by the further addition of three sixteenths. The third interpretation (top annotation layer) is similar to the first but maintains the super-metric pattern of the first phrase into the second, where it is extended by a 7/16 IMI. Each reading has its merit: the first expands on the previous appearance of the same motivic idea, ten seconds earlier, where it remains in 4/4; the second prioritizes surface-level cues in the drum part; and the third draws attention to the middle-ground correspondence between the two phrases. The necessary shift to sixteenth-note counting in the final measure is unusual and significantly destabilizes the—already short and weakly established—metric context.²

The numbers presented in **Table 6.1** promote a more sophisticated understanding of these irregularities than the preliminary figures of Chapter 2 (cf. **Fig. 2.13** especially), but the fundamental criteria presented in that chapter—irregular type(s) and hierarchical level—remain relevant. In summarizing these data, we can differentiate between predominantly 4/4 passages (by far the most common), other super-metric patterns (which, like 4/4 contexts, allow the retention of a standard backbeat), and patterns that involve irregularity at a lower hierarchical level (whether metric or sub-metric). Among 4/4 contexts, we can likewise distinguish 2/4 IMIs from lower-level ones. A summary of five categories is given in **Figure 6.1**; colour denotes contributions by different artists or sources and the relative size of each chart represents the number of IMIs of that type.

Most of the information in **Figure 6.1** is intuitive or recalls observations from earlier chapters: 4/4 grooves with isolated 2/4 measures are common among songs from the *Billboard* charts and in Amos's output, Radiohead is most experimental with IMIs at the super-metric level, and Tool and the *Wikipedia* lists skew towards lower-level irregularities. Unlike in **Figure 2.13**, where

² Because of this substantial metric instability, the excerpt from "Home" stands at the boundary between isolated and inconsistent irregularities. I return to this example in the following section, where I show how the first interpretation I offered meets my definition of the inconsistent type.

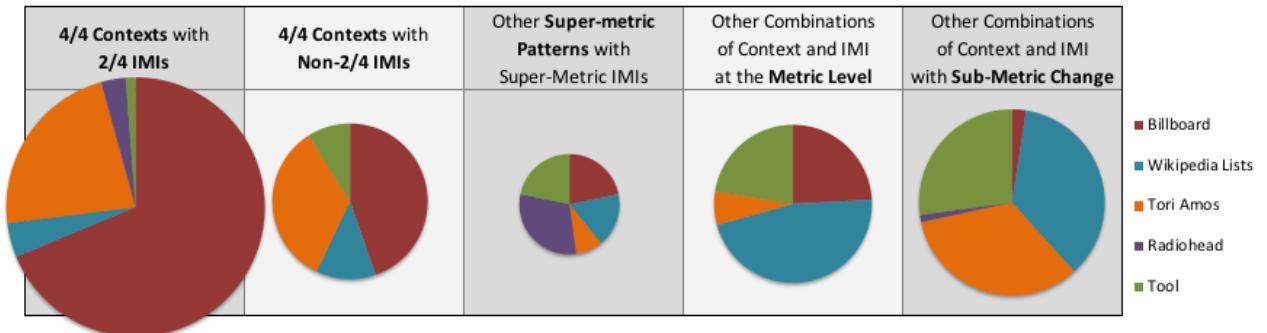


Figure 6.1: Summary of metric contexts for the isolated metric irregularities of the corpus, coloured according to artist/source.

categorization of hierarchical level was based on the lowest-level irregularity found in a full song, here we see entries from songs with different sorts of IMIs in potentially different metric contexts. The presence of examples from the *Wikipedia* lists in the leftmost column is the clearest example of this. Another telling detail, found in the figure's two rightmost columns, is the comparable prevalence of metric-level IMIs among *Billboard* sources and sub-metric IMIs in Amos's work. This trend follows Amos's penchant for introducing irregularity in compound metric contexts (see Chapters 4 and 5).

Drum-part Strategies

As we have seen in previous chapters, rock drumming practice admits many shades of stability and improvisatory play. The strategies drummers use to mark IMIs are likewise diverse and can be understood on the same continuum. The most stable possibility is to maintain a drumbeat despite any change in meter; the least consistent options involve marking an IMI with a drum fill, or by ceasing to play altogether. **Figure 6.2** further differentiates the strategies I encountered in my analysis and displays these sub-categories along an axis representing the prevalence of each as a percentage. A stable drumbeat of one sort or another continues through nearly half of the IMIs in the corpus. In about one quarter of these examples, the drumbeat is unchanged; however, in most cases, the drumbeat is varied slightly to accommodate the metric change. In a small number of examples, an IMI is marked by a shift to a new drumbeat—often an undifferentiated snare, cymbal, or kick. Fills are the next most common strategy, accounting for a further third of the irregularities. Some examples (less than 7% of the total) are rather subtle, treading the line between drumbeat variant and full-fledged fill. A straightforward example occurs in the prechorus of Tool's "Prison Sex," where beat three of a lone 3/4 measure is emphasized by a flam (see **Ex. 6.2**). While it does

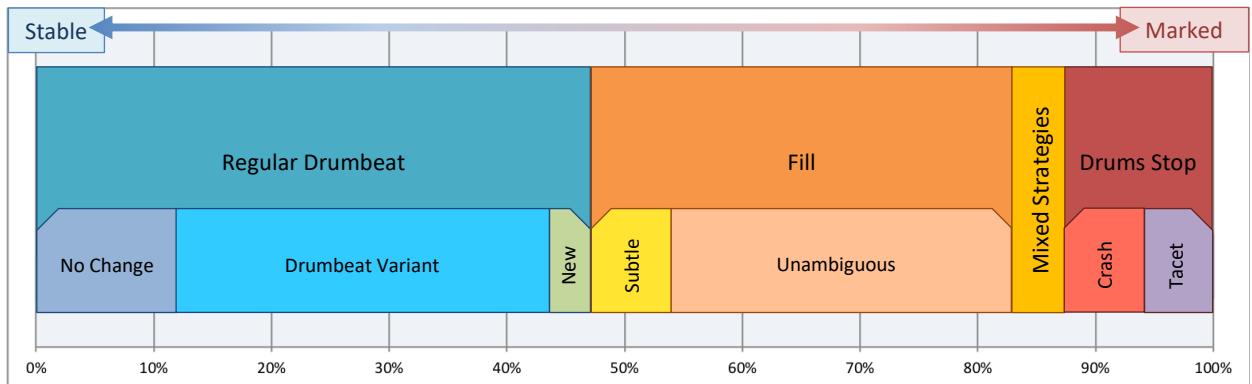


Figure 6.2: Summary of drumming strategies for isolated metric irregularities in the corpus.

[audio ex. only]

Example 6.2: A modest fill in Tool’s “Prison Sex” (1993).

[audio ex. only]

Example 6.3: Drums tacet for two beats in Big Data’s “Dangerous” (featuring Joywave; 2013).

not constitute a typical fill, the momentary change in articulation and intensity mark this moment as more than a variant of the drumbeat. Cases in which the drumbeat stops altogether are the most distinctly marked (these cover less than 13%). In about half of these cases, the downbeat of the IMI is announced by a lone crash (or splash) cymbal; in the other half, the drummer is tacet. **Example 6.3**, from Big Data’s “Dangerous” (featuring Joywave) illustrates the dramatic result of this production strategy. In the remaining IMIs (a little over 4%) we find a combination of multiple strategies, usually because a drumbeat or fill occupies only part of a measure before a short pause.

A more detailed analysis of IMI drumbeat practice emerges when we compare these data with the trends of individual artists and metric context. Drum fills are scarce in examples by both Amos and Radiohead; conversely, drumbeat variants are common. Tool is by far the least likely to retain a drumbeat without change through an IMI, likely because most of their examples involve irregularity at a low hierarchical level. Drumbeat retention is (predictably) most common in super-metric contexts. Examples in 4/4 with non-2/4 IMIs often feature a new drumbeat or a subtle fill—strategies that seem well-suited to conveying the moderate metric perturbations produced in such examples. With more marked drumming strategies, 4/4 contexts (of both types) are highly correlated with rests in the drums, while non-4/4 metric-level IMIs are the most common site for fills. It seems intuitive enough that this trend might be prompted by a more urgent need for rhythmic cues when navigating more metrically erratic situations. This notion is further supported by

sub-metric examples, which show a trend towards the even-more-stable strategy of drumbeat variants.

Interactions with Form

The relationship between IMIs and form can be approached from two different but related perspectives. I recorded both the formal context of each example (verse, chorus, etc.) as well as its position in the song as a whole (measured as a percentile of the song's duration). Apart from a relative absence from the very beginning and endings of songs, IMIs appear with reasonable consistency at all other points. They are slightly more common leading up to a song's halfway point (~35–50%; often within a second chorus) and slightly less common shortly thereafter (~55–65%; where we often find a bridge or instrumental). While the percentage measurement provides a reasonable overview of the IMIs in the corpus, the formal function is generally the more telling factor. IMIs are most common in chorus sections (with 120 examples in the corpus). This trend is somewhat skewed by Amos's marked preference for the chorus as a site for metric play; over half of the IMIs in her recordings occur in a chorus. Verses are next most common (88 instances), followed by prechoruses and instrumentals (around 45 each). Bridges, breakdowns, intros and outros are all less likely formal locations. The relative scarcity of IMIs in bridges suggests that they are more metrically stable interthematic functions; other sections with low tallies are simply not found in every song.

Percentage measurements do not interact in meaningful ways with the tendencies of individual artists or with drumming strategies (features like the relative prevalence of drum fills in the 40–80% range are hardly surprising). The only notable correlation between percentage and metric context is that 2/4 IMIs in 4/4 contexts are far more common in the final third of a song (specifically, in the 70–85% range) than elsewhere, a trend that can mostly be attributed to final choruses. Indeed, formal section is a better predictor than percentage in many respects, including Amos's aforementioned affinity for chorus-IMIs and a generally high incidence of 4/4 grooves with 2/4 IMIs in chorus sections (and, to a lesser extent, bridges). Other irregularities within 4/4 contexts gravitate towards prechoruses, more irregular metric-level play is best suited to verses, and sub-metric IMIs are found disproportionately within instrumentals. The more intense the irregularity, the less predictable we might assume the host formal section to be, and the ranking suggested by this data set of chorus, bridge, pre-chorus, verse, instrumental (from most to least predictable) seems fairly intuitive.

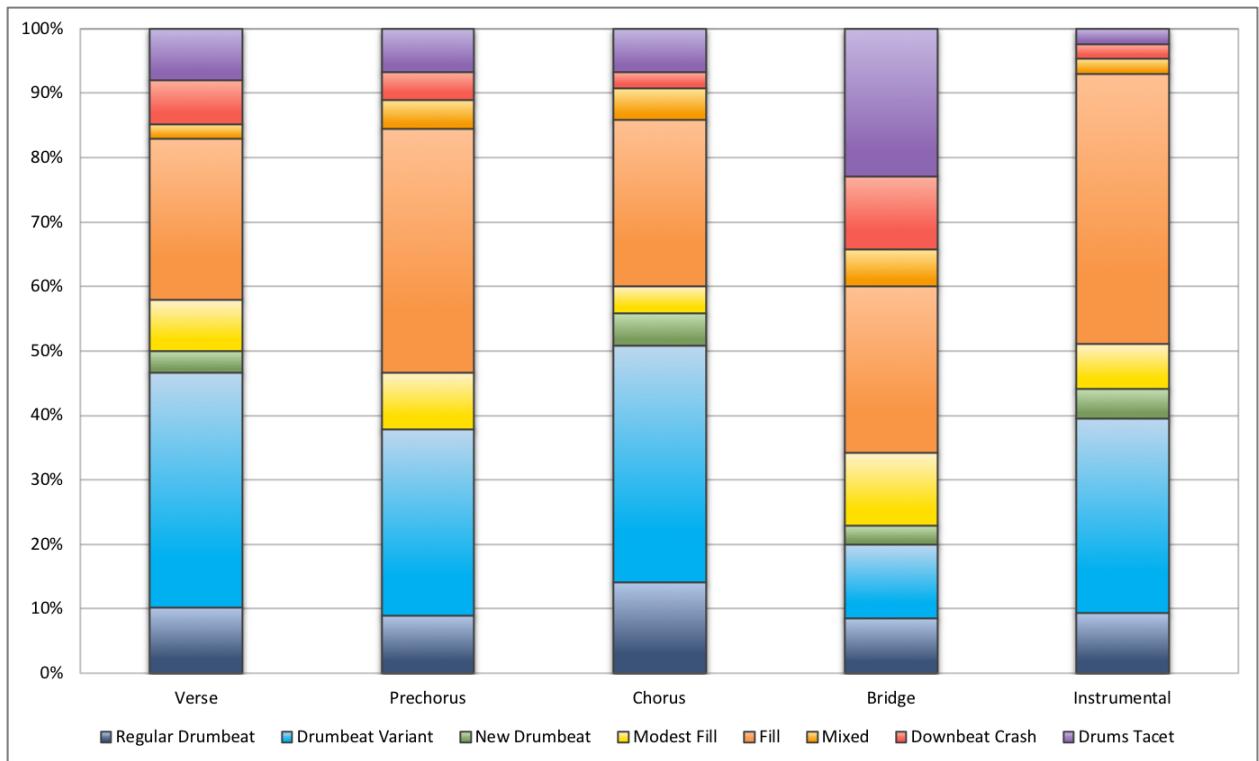


Figure 6.3: Correlation of drumming strategies with formal section for isolated metric irregularities in the corpus.

Form and drumbeat are connected in similar but subtler ways (see **Fig. 6.3**). The most prominent trend concerns bridges, where we find the highest incidence of drum-part drop-outs (both with and without a downbeat crash). A more modest discrepancy can be seen between the preference for drumbeat continuation in verses and choruses (50% or more, including examples with a new drumbeat) and the prevalence of fills in prechoruses and instrumentals (45–50%). Considered alongside the previous discussion of metric context, this last observation suggests an interesting contrast between the handling of IMIs in verses and prechoruses. While irregularity in verses is more often marked by a less predictable play between metric context and isolated measure, prechorus IMIs are more likely to be embellished with a fill. These correlations should not be overstated (as **Fig. 6.3** shows, most of the differences in drumming practice between formal section are modest); more than anything else, these data support the notion that interactions between musical parameters are complex.

Formal function is one of the few parameters that demonstrates the value of asking whether an IMI is repeated or unique. Naturally, IMIs in certain formal sections (intros, bridges, instrumentals, etc.) are unlikely to repeat simply because the section itself occurs only once. More telling, however, are the nuances between and among verses, prechoruses, and choruses. IMIs found in choruses that

follow a regular, foursquare hypermeter are more likely to be repeated than those in hypermetrically irregular chorus extensions (chorus tags), as these extensions typically mark a variation to an earlier version of the chorus. Verse IMIs are nearly twice as likely to be unique as chorus IMIs, while those within prechoruses are less unique. This supports the notion that, whereas verses are flexible, changeable formal spaces (e.g., supporting new lyrics with each appearance), prechoruses play a more circumscribed role—typically following the same path from verse to chorus on each occurrence.

Intraformal Organization

Trends at the intraformal level are the most consistent of all the parameters considered—so much so that Biamonte (2014, [7.6]) limits her remarks on IMIs (which she calls “partial-bar links”) to “the ends of formal sections [where] they function as sectional boundary markers.” In my findings, nearly 60% of all IMIs occupy the final measure of a formal section and a further 23% engage the penultimate measure. These trends follow the observation, made in Part II, that irregular metric structures are most likely to deviate from a given pattern at the end of a cycle or phrase (following Murphy’s “Platonic-trochaic” model). Mid-phrase irregularities account for only 13% of the total and those in the first two measures of a phrase tally just over 3%. Because intraformal organization yields such a clear trend, it is the easiest parameter to correlate with other IMI variables. Tendencies in drumming practice are perfectly predictable: fills and drop-outs are associated mostly with final-measure IMIs, regular drumbeats with mid-phrase examples (early-phrase irregularities provide too little data for meaningful correlation). Likewise, Amos employs mid-phrase IMIs more than any other artist (outpacing all but Tool by a factor of 9.7).

Interactions between metric context and intraformal placement were somewhat more surprising (see **Fig. 6.4**). Penultimate-measure IMIs correlate strongly with 2/4 irregularities in 4/4 grooves. This is likely related to the ease with which ambiguity appears in these metric contexts, a topic I explore further later in this chapter. Among irregularities at the beat level, those within a 4/4 groove (yellow bars) are more likely to occur mid-phrase, while those in already-irregular contexts (light blue) follow the general trend towards end-of-phrase placement. This inverse relationship between underexplored intraformal space (mid-phrase examples) and more irregular metric context suggests

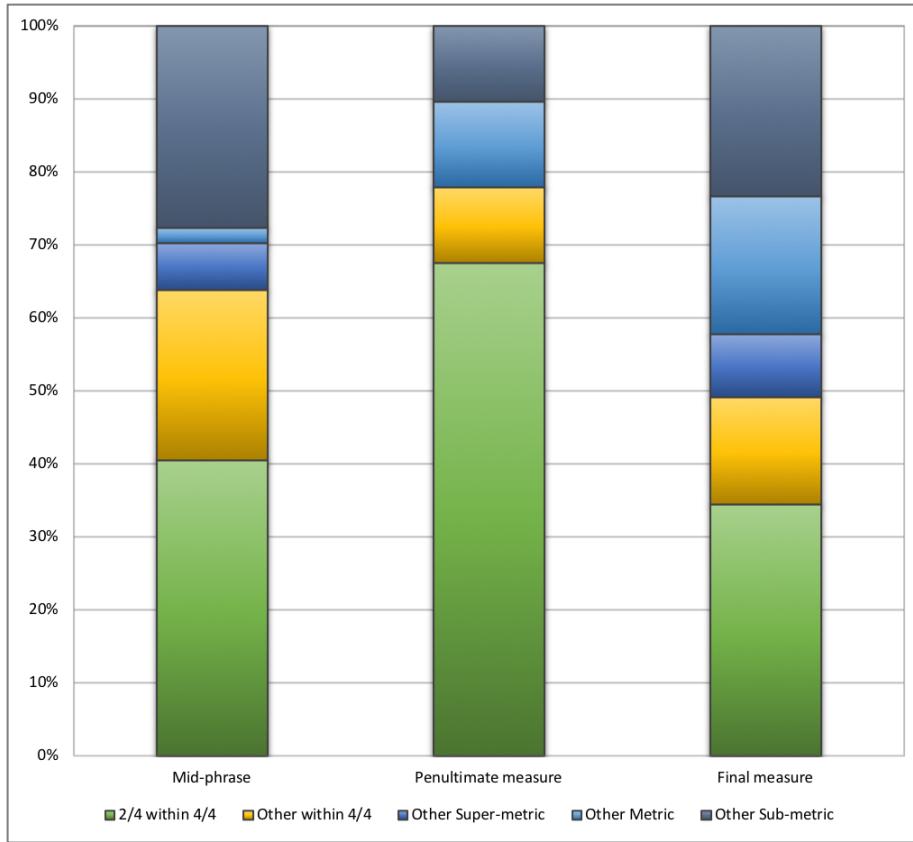


Figure 6.4: Correlation of metric context with intraformal placement of isolated metric irregularities in the corpus.

that, in general, most artists strike a balance between competing irregular features.³ At first glance, the distribution of “other sub-metric” IMIs (dark blue) would seem to contradict this notion of balance; however, a vast majority of the mid-phrase entries in this category are sub-metric only because they exhibit compound meter—usually 6/8, one of the most stable possibilities.

Although early-phrase IMIs constitute one of the rarest subtypes of these irregularities, the role that they play in shaping phrases and formal flow is both straightforward and fairly consistent. In almost every case, the affective idea conveyed by an irregularity at the start of a phrase is one of uncertainty, hesitancy, or lack of confidence. (By contrast, phrase-ending IMIs are so abundant that they are, as a group, emotively promiscuous.) The first verse of Tori Amos’s “Spark” exemplifies the expressive potential of an early-phrase IMI, associating metric instability with the grief of an

³ This hypothesis aligns well with the findings of Witek et al (2014, 8). In a study of syncopation and movement, they note that listeners experience pleasure and are motivated to move when exposed to music that exhibits a “balance between sufficient rhythmic predictability for metre to be perceived and metrical expectations to occur, and sufficient complexity for those expectations to be violated and thus pleasure to be released.”

autobiographical character who has just been through a miscarriage (refer back to **Ex. 1.2**).⁴ The example is complex because the verse is irregular at multiple hierarchical levels: its five phrases yield a structure of (6,7)(6,6)(6,7)(6,7)(6,10). It is therefore unclear whether the IMI is best identified as an early measure of 7/8 within a (temporarily) 6/8 context, or as an early 12-beat phrase in a predominantly 13-beat context. These ambiguities reinforce the metric effect given by the verse of a shaken soul who has lost her faith—as Amos put it, “I was really angry at God.”⁵

Interactions with Vocals

Trends in the presence or absence of vocals from IMIs reinforce many ideas already encountered: the prevailing role of these irregularities is to close a phrase, metric tendencies contribute to distinctions between formal sections in complex ways, and Amos’s practice is exceptional in most respects. The role of the vocal part within an IMI ranges from textural focal point to total absence and admits more nuanced possibilities: limited participation—holding a final note or picking up into a new phrase—or impending participation (with an entry in the following measure). In general, vocal activity is correlated with repeated irregular passages, largely because intros and instrumentals are unique formal sections. Amos is the most likely to sing through IMIs, a trend skewed by her penchant for mid-phrase irregularities, while Tool’s examples have the highest percentage of limited vocal participation.

Trends in vocals and intraformal placement are reasonably intuitive. Mid-phrase IMIs are likely to feature vocals, while phrase-ending irregularities typically involve limited or impending vocal participation. In other words, because the corpus comprises vocal music, any formal section (including all those that end with IMIs) is likely to be followed by a new vocal entry in a new (texted) section. At the level of full formal section, chorus IMIs are more likely than those of other sections to contain prominent vocal elements. This observation is mitigated, however, by a formal detail not noted earlier—namely, chorus IMIs are more likely to occur mid-phrase (due to many examples by Amos) or in penultimate measures. Thus, the higher likelihood that vocals are present through chorus IMIs does not necessarily imply that vocal phrasing in choruses carries through to the end of a hypermeasure more often than in other sections.

⁴ See, e.g., Daniel Durchholz’s review for Wall of Sound, reproduced at <http://www.smoe.org/lists/precious-things/v03/v03.n167> (accessed June 5, 2018).

⁵ Interview in *Deluxe* magazine, May 1998, reproduced at <http://thedent.com/deluxe0598.html> (accessed June 5, 2018).

Finally, the drumming strategies that accompany IMIs with and without vocals are surprisingly similar. The only significant distinction is that, when vocals are present, drop-outs (with or without crash) are more common, dramatizing the singer's part; instrumental IMIs are more likely to employ fills, showcasing the instrumentalist. Cases with impending vocals are the most distinct in terms of the drum strategies they employ. More than half of these irregularities are marked by a drum fill, and they are the only context in which a drop-out is more likely than a regular drumbeat. In fact, regular drumbeats are significantly less prevalent in IMIs that immediately precede a vocal entry (17%) than in those that end a phrase (31%), indicating that, at least in this instance, vocal cues are a better predictor of drumbeat practice than phrase or form.

AMBIGUOUS AND DISTINCTIVE EXAMPLES

Because IMIs occur in such a variety of contexts, and because they engage with so many musical parameters, the preceding overview may seem rather opaque. In this section, I offer a more concrete view by examining several recurring uses of IMIs in the corpus. Much of this discussion centres on the super-metric level—the most pervasive context for IMIs. Ambiguities of grouping and of tactus are relatively common and, while it is impractical to review every possibility, I highlight a variety of metric ideas and drumming strategies. I also give special attention to Radiohead's super-metric practice, which differs from that of other artists. At lower hierarchical levels, ambiguity is less prevalent, but several examples employ IMIs to effect striking transitions from one meter to another. I present examples of two strategies, based on triple groupings and a unique class of phrase overlaps that I term *metric pivots*.

Super-metric Patterns and Ambiguities

As we have seen repeatedly, the super-metric level is easily complicated by the possibility of backbeat retention in the drums, which can foster ambiguity. A common strategy involves using disparities between the first and second halves of an established beat to suggest how an IMI relates to the surrounding grouping structure. Examples in three songs by Tori Amos illustrate a range from normative drumming practices to modifications that introduce ambiguity. Another sort of complication arises when the tactus of a song changes through half- or double-time shifts between formal sections, as shown in the final example of this section—The Struts's “Could Have Been Me.”

The three choruses of Amos's “The Beekeeper” demonstrate a typical drumming strategy and subtle variants based on it (see **Ex. 6.4**). In each chorus, a hypermetric structure of (4,4) is expanded

First Chorus ♩ = 68

B G♯m

Voice "Do you know who I am?" she said I'm the [2mm.]
very thin ride (blends with hats)

Drums samples (varied)
soft snare Initial drumbeat

25 D♯m B

when it's your time "Don't be a - afraid I [etc.]

Abbreviated Returns in full

Second Chorus

[3mm.] add shaker
with sample as before assertive snare [etc.]

Initial drumbeat New idea Retained and expanded

Third Chorus

[3mm.] no shaker; tamb. on 2 and 4
with sample [etc.]

Initial drumbeat Abbreviated New idea (from 2nd ch.)

Example 6.4: Three choruses with different drumbeats across the same hypermeter in Tori Amos's "The Beekeeper" (2005).

by the addition of a single measure of 2/4 between the two phrases. The regular beat through the 4/4 meter of the first chorus involves only one kick drum and one snare drum articulation per measure, marking the first and second beats respectively. Thus, the repetition of the Kick – Snare

articulation in the 2/4 measure and in the two beats that follow is a strong cue for the location of the IMI and for the subsequent return to 4/4 time. In both the second and third choruses, the drumbeat changes substantially in the second phrase, introducing a more assertive snare tone and adding a syncopated mid-measure kick drum. In the former case, the absence of the snare altogether from the first phrase heightens the impact of the new snare tone, which is introduced in the 2/4 measure. The kick drum is the clearest percussive cue for the return to 4/4 time (aligning with both vocal phrasing and our inherited expectations from the first chorus). In the third chorus, the original softer snare is present in the first phrase, but sometimes on beat four rather than beat two (as in the first measure of the phrase in the transcription); the addition of the more assertive snare is delayed until after the IMI. The drumbeat during the lone measure of 2/4 bears a different relationship to the surrounding music in each of the three choruses: in the first, it abbreviates the 4/4 drumbeat, which is otherwise consistent throughout the chorus; in the second, the IMI initiates a new drumbeat which continues through the second phrase; and, in the third chorus, the initial pattern continues through the 2/4 measure and then changes.

Despite nuances at the music's surface, the super-metric structure of all three choruses in "The Beekeeper" is entirely unambiguous. The clarity of the hypermeter is largely due to harmonic rhythm and vocal phrasing, but the drums also contribute. In all three cases, the drumbeat through the IMI corresponds with the first half of a drumbeat established elsewhere (either before or after the 2/4 measure, or both). Among 4/4 passages with 2/4 IMIs, in which the drums play a variant of the normal beat, the preferred approach is to employ the first half of the normal groove. Thirty-six of forty-six examples follow this norm; by contrast, only seven IMIs are modelled on the second half of the adjacent drumbeat. In the remaining three examples, the groove is varied to the extent that it is difficult to assert one half or the other as a template (blurring the line between drumbeat variant and modest fill). The opposite preference—using the second half of the measure as a model—seems to be characteristic of most 6/8 grooves with isolated 3/8 measures, though there are too few of these cases to confirm a normative practice. The prechoruses of Amos's "Dark Side of the Sun" contain such an irregularity (see **Ex. 6.5**; this example could also be counted in 6/4). The distinction between the two halves is established through the addition of a second kick drum in the second half (on beat five), a feature shared by many 4/4-with-2/4 examples. The 6/8 groove also features a dotted-rhythm syncope in the first half, whereas the second half is the more common site of syncopation in 4/4 examples (often through a familiar displacement dissonance in the kick drum).

$\text{♪} = 127$

15

Voice: Brush back my tears and he said "girl,"
we have to soldier on___ yes, girl e - ven when [etc.]

Drums: stick clicks

Metric grouping: A B A B

Example 6.5: A 3/8 IMI modelled on the second half of a 6/8 groove in Tori Amos's "Dark Side of the Sun" (2007).

My final example by Amos depicts a recurring device in her songs, in which the apparent placement of an IMI in the drums is misaligned with cues in vocal phrasing and harmonic rhythm. In the bridge of "Flavor," drummer Matt Chamberlain delays his performance of an isolated measure until the end of the section, while Amos's piano (supported by bass) implies the penultimate measure as the site of the IMI (see **Ex. 6.6**). In the drums, a sixteenth-note kick-drum anacrusis has anticipated nearly every downbeat since the start of the song; the regular continuation of this cue through the bridge encourages the listener to maintain entrainment to a regular, four-beat "inter-downbeat" interval until the early appearance of chorus material demands an adjustment. The harmonic rhythm of the final two measures diverges earlier, moving from two beats over $\hat{6}$ to a full measure on $\hat{5}$. This same metric quirk is found in several songs by Amos, including "Sweet Sangria," in which Chamberlain delays the adjustment by two measures before reuniting with the rest of the band through a modest fill.

As several examples through Part II of this dissertation have shown, ambiguity of tactus can pose significant complications for metric analysis. A comparison of the two prechoruses in The Struts's "Could Have Been Me" illustrates how the same sort of ambiguity can impact our interpretation of an IMI. **Table 6.2** provides a form diagram of the song, showing fluctuations between a quick rock groove (160 bpm) and half-time drumbeats that suggest a slower tactus (80

$\text{♩} = 69$

Turn off the
sim.
Initial drumbeat

50

fre - quen - cy what does it look

First 1/2 variant

Example 6.6: Ambiguity of IMI placement between drums and harmonic rhythm in Tori Amos's "Flavor" (2009).

Formal Section	introduction	verse 1		prechorus	chorus
Feel (Tempo)	fast (160 bpm)		slow (80 bpm)	ambiguous	slow (80 bpm)
Hypermeasure		regular 2	regular 2	once 7	regular 2
Measure	once 2	regular 2		irregular 4, 3	regular 2
Half Note and below	regular	pure duple		irregular 2, 1	regular 2

interlude	verse 2	prechorus	chorus, interlude	double chorus
ambiguous	fast (160 bpm)		slow (80 bpm)	
once 2 (regular 2)	regular 2 (regular pure duple)	irregular 4, 3 2, 1	as before	as before

Table 6.2: Form, hypermeter, and tempo in The Struts's "Could Have Been Me" (2014).

[audio ex. only]

Example 6.7: Changing drumbeats and tempi in The Struts's "Could Have Been Me" (2014): (A) underdetermined first verse, ambiguous prechorus and half-time chorus; (B) fast second verse and prechorus.

bpm). Arrows denote shifts in tactus from one feel to the other; formal sections with ambiguous tactus are notated at the slower tempo to minimize shifts, but this should not be understood to imply a preferred hearing on my part. As we will see, the shorthand annotations of the table do not adequately reflect the song's ambiguities.

Before the first shift in tactus, midway through the song's first verse, the groove is underdetermined (see **Ex. 6.7A**). My identification of the faster tempo here is influenced by the singer's initially brisk diction, as the undifferentiated percussive elements could mark either the quarter or eighth. With the addition of the drum kit, a partial backbeat indicates the slower tempo, to my ear overriding the aforementioned vocal cues. In the prechorus, the undifferentiated percussive pulse moves to the kick drum and the harmonic rhythm accelerates, teasing—but not confirming—the faster tempo. The first unequivocal drumbeat is withheld until the chorus, temporarily affirming the slow tempo. The second pass through verse and prechorus is far less ambiguous (see **Ex. 6.7B**). The faster tempo is reinstated by a standard backbeat, which gives way to undifferentiated quarters (not eighths) on the snare and crash cymbal. The chorus returns as before, and the half-time groove lasts through the end of the song.

While numerous different grooves are deployed throughout the song, the prechorus is the only formal section of "Could Have Been Me" that might include irregularity at the super-metric level. Moreover, the prechorus is the only section that is never supported by a standard backbeat, leaving interpretation of the IMI ambiguous. Because the second chorus continues the fast tempo of the preceding verse, the irregularity never moves below the level of the measure. Listeners who are familiar with the song may come to anticipate the feel of the second verse and prechorus when listening to the first; it is even possible that a conflation of the two spans could take precedence over the potential backbeat in the first verse, leading listeners to engage with the faster tactus despite the slower drum-kit cues. The ambiguous status of the IMI in the first prechorus constitutes a case at the boundary of inclusion in the corpus, reinforcing the blurry status of all such boundaries. By any analysis, the irregularity is a mild one, but the conflict between two viable interpretations of the moment nevertheless invites attention.

Super-meter in Radiohead

Of a total of twelve IMIs with drum-kit support in Radiohead's contributions to the corpus, eleven are at the super-metric level (the exception is a sub-metric shift midway through “2+2=5”). About half of these follow the pervasive trend in the rest of the corpus of extending or abbreviating a 4/4 groove through an irregularity at the end of a formal section (see, e.g., the choruses of “Lucky”). In the other half, the relationship is inverted—an odd-cardinality super-metric pattern is punctuated by one or two measures of 4/4. This might seem like an unremarkable approach to super-metric patterning, but the corpus contains only ten such examples, six of which are by Radiohead.⁶

In Radiohead’s practice, the drumming strategies that mark IMIs within odd-cardinality contexts are quite flexible; no two songs share an approach. Two instances in “Idioteque,” the first closing the intro and the second in an extended instrumental vamp, evince drumbeat variance within a modified strategy of abbreviation. As Osborn (2017, 86) notes, the first “goes by almost unnoticed because, in shedding its last two beats, the percussion leaves behind a paradigmatic backbeat.” Other potential super-metric irregularities are cleverly hidden through the song’s second verse.⁷ The metric/formal deployment of IMIs in “Black Star” bears some similarity to that of “Idioteque.” Irregularities again appear in the intro and instrumental, modifying an otherwise 3/2 groove. The two songs differ with regard to drumming strategy; instead of variants on an existing drumbeat, “Black Star” contains written-out fermatas, adding two beats in the intro and four in the instrumental (the latter can be heard in **Ex. 3.17**). A lone IMI in “Go to Sleep” (Little Man Being Erased) shows a third possibility, in which a 3/2 groove is extended by two beats (or punctuated by a 4/2 unit), marked by a modest fill. Most recently, in “All I Need,” Radiohead takes advantage of a G5/2 grouping dissonance at the half-note level between a five-half-note riff and a single-measure backbeat pattern (see **Ex. 6.8**). The two-measure vamp that separates the first verse and chorus is irregular in the 5/2 context of the verse, necessitating an abridgement of the bass part. The drumbeat, however, can continue its four-beat cycle unaltered except for an occasional sporadic

⁶ Amos and Tool offer only one example each (in “America” and “Eulogy,” respectively); the remaining two come from Pearl Jam’s “The Fixer” (transcribed in **Ex. 3.16**) and TTNG’s “26 Is Dancier than Four.” Mumford and Sons’s “Lover of the Light” contains a further two debatable cases, which I view differently because the larger cardinalities involved (nine- and eleven-half-note patterns) are less evocative of a clear cyclic structure than the three- and five-half-note grooves of other examples.

⁷ The section is based on a prolonged and notably unstable grouping dissonance (see Osborn’s Table 3.6). The half-note shifts in the misalignment of the (mostly 3/2) drums with an overarching 4/4 metric framework further exemplify Radiohead’s penchant for complicating odd-cardinality super-metric patterns.

Swung 16ths, $\text{♩} = 88$

Initial drumbeat / over the barline etc.

26

[6mm.]

Same drumbeat

Example 6.8: A structural IMI with unchanging drumbeat in Radiohead’s “All I Need” (2007).

beat-long rest—a recurring feature rather than a new one (cf. the third and fourth transcribed measures with the second-to-last one).

Metric and Sub-metric Transitions

In metrically irregular contexts involving lower hierarchical levels, the general trend among IMIs favours expansion over deletion, a reversal of those at the super-metric level. Review of **Table 6.1** shows that 5/4 grooves most often contain 6/4 IMIs, 7/8 expands to 4/4, 9/8 to 11/8, and 11/8 to 12/8.⁸ Most of the time, analysis of these situations is quite straightforward, especially with knowledge of the drumbeat proclivities surveyed in Part II. Ambiguity of the sort encountered at the super-metric level is rare because irregular meters are typically overdetermined. The most interesting examples involving low hierarchical levels occur when an IMI marks the boundary between two different grooves, especially if one (or both) is irregular. In this section, I assess two types of

⁸ Grooves in 7/4 are exceptional, typically involving shorter IMIs of a single 4/4 measure, and 13/8 passages are as likely to be punctuated by 14/8 or 12/8.

The musical score illustrates a complex metric transition. At the top, the 'Electric guitars' and 'Drums' parts are shown. The guitars play a rhythmic pattern of eighth-note pairs and sixteenth-note groups. The drums provide a steady background with eighth-note patterns. A bracket under the guitars is labeled 'Partial tresillo' and 'Lingering double-time feel'. A bracket under the drums is labeled 'Double tresillo'. The tempo is marked as $= 95$.

Below this, the score continues with a section labeled '(Double?) tresillo'. The guitars play a more complex eighth-note and sixteenth-note pattern. The drums continue their eighth-note pattern. The time signature changes to $\frac{3}{4}$.

At measure 102, a 'sweep' is indicated above the guitars. The guitars play a sixteenth-note pattern with a 'sweep' technique. The drums play eighth-note patterns. The time signature changes to $\frac{6}{8}$. A box labeled 'Bridge' is shown above the guitars.

At the bottom, the guitars play a sixteenth-note pattern. The drums play eighth-note patterns. The time signature changes to $\frac{6}{8}$ and then to $\frac{8}{8}$. A bracket under the guitars is labeled 'Double-time compound meter/rhythm'. A bracket under the drums is labeled 'Compound meter'.

Example 6.9: A multi-stage metric transition in Avenged Sevenfold’s “Welcome to the Family” (2010).

metrically irregular transition: the first occurs when triple groupings and/or tresillo successions destabilize a 4/4 groove, smoothing a shift to a triple meter. The second comprises several strategies of overlap and elision through which irregular meters are joined to one another or to regular meters, or that lead to the formation of an irregular IMI in an otherwise stable metric context.

The transition from guitar solo to bridge in Avenged Sevenfold’s “Welcome to the Family” exemplifies the first type (see **Ex. 6.9**). The passage contains three discernible meters and four potential grooves. For the most part the guitar solo is in a double-time 4/4, but the final phrase

anticipates a slower tactus through repeated tresillo successions articulated by the drums.⁹ A double tresillo on the snare initially responds to the double-time feel; upon repetition, the omission of the second (snare) articulation contributes to the gradual slowing of the passage. The motivic repetition in the lead guitar further supports a hearing of the penultimate measure (third measure of the transcription) as articulating a regular tresillo. The alternation of double-time and regular tactus measures continues, deleting the comma from the earlier tresillo structures. This results in a measure with an apparent 12/16 rhythm (I notate the IMI in 3/4 for consistency with the earlier tresillo syncopations), followed by a somewhat slower 6/8 groove, initiating the bridge (dotted quarter = 63; eighth = eighth). Because tresillo rhythms are commonly employed by rock drummers within phrase-ending fills, the introduction of triple groupings within a pure duple meter is unobtrusive. Having established triple elements at the musical surface, the shift to triple and compound meters is likewise eased. The metric complexity of the transition is thus subordinate to the ongoing display of instrumental virtuosity—a display that is, in turn, subtly enhanced by the shifting metric structure.

The final texted section of Tool’s “Undertow” contains a similar transition, in which an IMI mediates two stable, repeating grooves (see **Ex. 6.10**). The two-bar pattern that opens the section foreshadows the importance of the dotted quarter note through an anacrusis to every second measure. Within a 4/4 groove, alternating between half-time feel and backbeat-based fills, a succession of (4,3,3,2,2,2) emerges. On its fourth iteration (at the end of the second system in the transcription), the dotted rhythm continues through the end of the second measure, creating a retrograde double tresillo (4,3,3,3,3). This rhythmic variation is a fitting close to the eight-measure phrase, extending the dotted idea while remaining within the overarching 4/4 meter. On a first listen, it seems that the next eight measures repeat the first phrase in its entirety with some variation in the lyrics. As the dotted rhythms continue beyond the two-measure boundary, however, we might retrospectively hear a new cyclic pattern, one that began midway through the previous 4/4 measure. This hearing is confirmed when a new, nine-beat idea is repeated three times (the last abridged by the entry of the final instrumental outro).

The metric structure of this example is more complex than the listening experience might indicate. When listening, I retain the initial 4/4 meter until the onset of the nonuple pattern, at which point I abandon the duple/quadruple structure and entrain to the persistent dotted rhythm,

⁹ Measure numbers in the example assume changes of tactus for shifts between regular and double-time grooves; such shifts are common in the song and usually align with formal boundaries.

$\text{♩} = 87$

with quarter-note delay

Voice: down I'm in the un-der-tow I'm help-less and I'm a-

Electric guitar: D⁵ F⁵ D⁵ G⁵ B^{b5} D⁵ F⁵ D⁵ D⁵ F⁵ D⁵ G⁵ A^{b5} D⁵ F⁵ D⁵

Drums: (varied)

109

wake I'm in the un-der-tow a -

D⁵ F⁵ D⁵ G⁵ B^{b5} D⁵ F⁵ 2 D⁵ D⁵ F⁵ D⁵ G⁵ A^{b5} G⁵ D⁵ F⁵ A^{b5}

113 guitar and drums as before (not exact, slight drift)

wake die be-neath the un-der-tow there does-n't seem no o-ther way out of the

119

un- der- tow Eu

D⁵ F⁵ D⁵ G⁵ A^{b5} G⁵ D⁵ F⁵ G^{#5} A⁵ C⁵ C^{#5} D⁵ F⁵ D⁵

121 guitar and drums repeat, varied

pho ri a

Example 6.10: A metric shift based on expansion of an earlier rhythmic motive in Tool's "Undertow" (1993).

aided by the new vocal cue—the first syllable of “euphoria.” However, because the nonuple meter interrupts an established regular metric structure, the transcribed result requires an IMI (the measure of 5/4). Compared to the transcription, a tree diagram offers a better representation of the structure

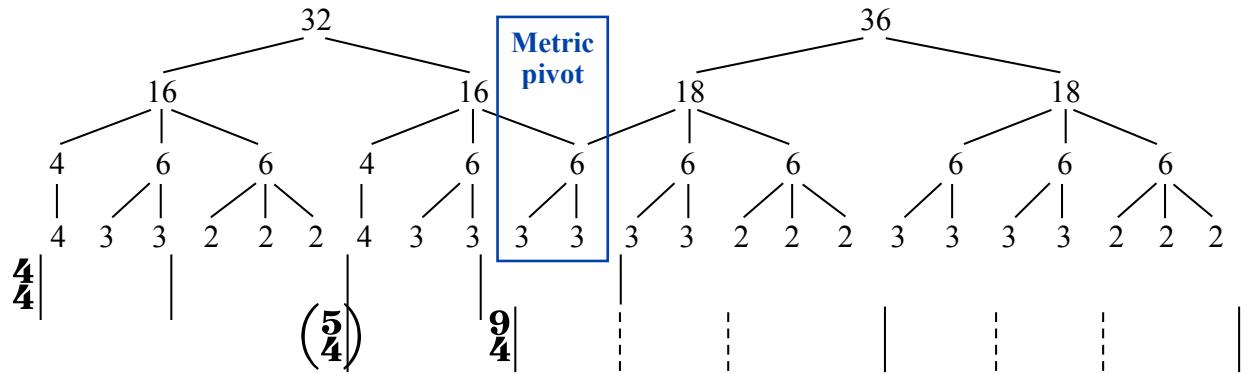
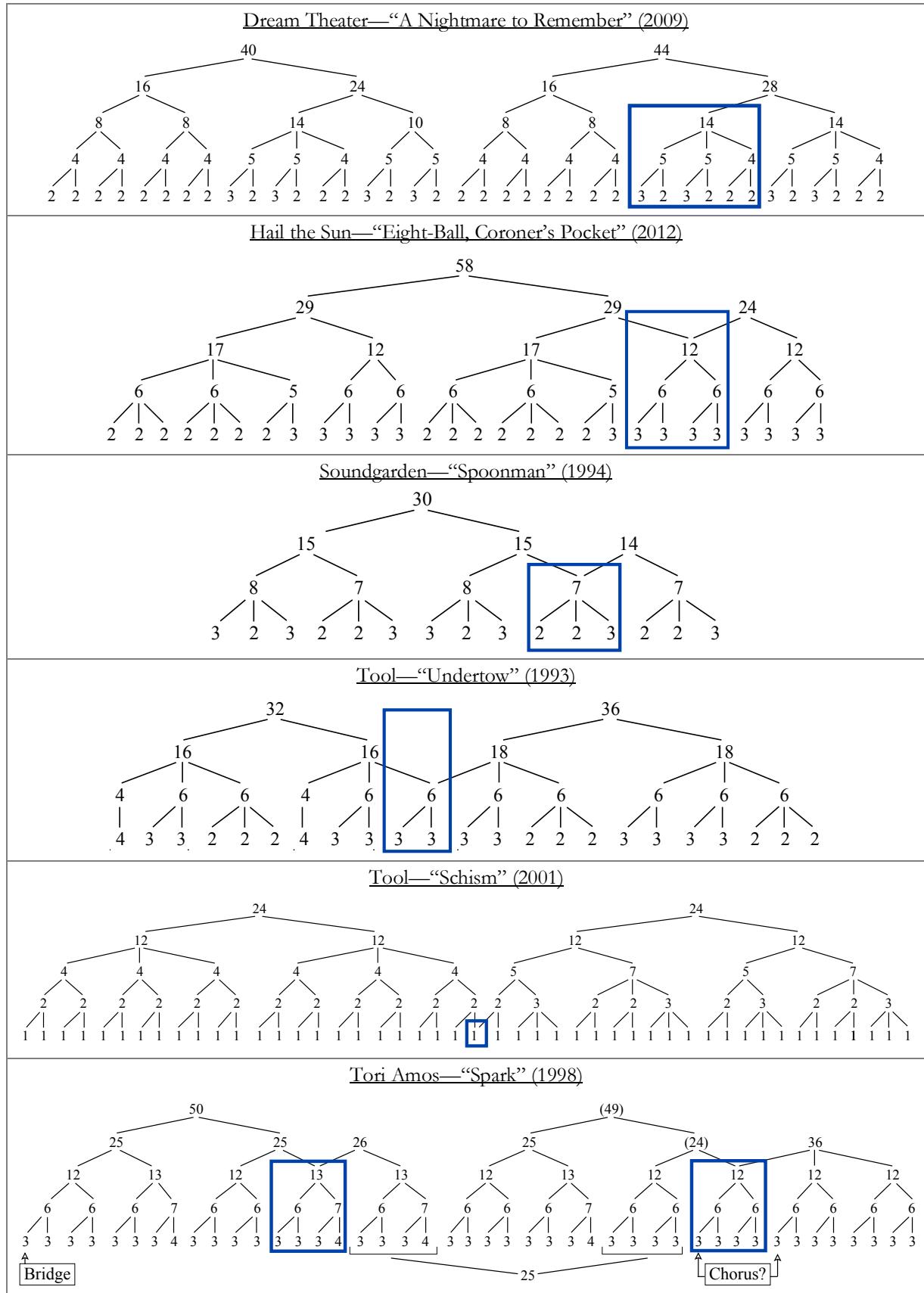


Figure 6.5: The structure of the metric shift in Tool’s “Undertow” (1993).

as experienced when listening (see **Fig. 6.5**; time signatures are supplied to facilitate comparison with **Ex. 6.10**). In the figure we see the contents of the overlap—a metric pivot—and the level at which it takes place, at the intersection of two stable grooves. The most important feature of this example, supporting the joining of the two tree structures (as opposed to the more conventional approach, in which one side supersedes the other), is that the overlapping material does not announce its newness until the pivot has passed. Rather, the music that constitutes the pivot delivers the expected continuation of the initial groove, while simultaneously initiating a new musical (and metric) idea. Note that all of the beats below the level at which the two sides meet belong to both grooves. In this conception, the period of overlap is not localized to a single point in time (“a durationless instant” in the words of Hasty 1997, 70), but occupies the entire time-span under consideration. Note also that the levels above the pivot are all drawn into the structural anomaly, which radiates upwards, dissipating gradually as our ability to entrain attenuates.

Tree diagrams like the one modelled in **Figure 6.5** are useful in describing and differentiating several examples of metric pivots in the corpus, most of which invoke an IMI in transcription despite the availability of a simpler prosodic explanation. **Table 6.3** catalogues six such examples, which demonstrate metric pivots at a variety of hierarchical levels, occupying different locations within the initial groove. In the majority of cases, where the overlap concerns phrase-ending material, it is possible at first to interpret an extension (or “motivic residue”); the details of each specific example will dictate whether or not the emergent groove is reinterpreted (either retrospectively during the first hearing or upon subsequent listening) as interrupting the preceding meter. Many examples are best understood as extensions, repeating the second half of some larger structure (usually only once). This model can be seen in Hail the Sun’s “Eight-Ball, Coroner’s

**Table 6.3:** Tree structures of six metric pivots in the corpus.

[audio ex. only]

Example 6.11: A short metric pivot with a strongly interruptive gesture in Tool’s “Schism” (2001).

[audio ex. only]

Example 6.12: A mid-phrase metric pivot as a means of phrase expansion in Dream Theater’s “A Nightmare to Remember” (2009).

[audio ex. only]

Example 6.13: Two metric pivots complicate metric and formal structure in Tori Amos’s “Spark” (1998).

“Pocket,” Soundgarden’s “Spoonman,” and the first pivot in Amos’s “Spark.”¹⁰ At the other end of the spectrum lies the passage in Tool’s “Schism,” which almost certainly implies an interruption immediately because of its low hierarchical level and because the “new” material is familiar from earlier in the song (see **Ex. 6.11**). The brevity of the pivot in “Schism,” as well as its location at the boundary of two formal sections, result in a situation that very nearly approximates a traditional conception of elision. I argue that the use of the guitar’s triplet anacrusis as a link between the two grooves provides a short span of music in which neither meter supersedes the other.

When the pivot concerns mid-phrase material, the cycle of the initial meter is necessarily interrupted by the continuation of the new groove. Extension can still offer an intuitive explanation, but the specific structure is different. Specifically, the moment of extension is delayed beyond the end of the pivot itself, arriving only when it is revealed that the expected phrase-ending material has been overwritten by a repetition of the pivot material. The pivot in Dream Theater’s “A Nightmare to Remember” exemplifies this structure (see **Ex. 6.12**). The first phrase opens with a pure duple measure of 4/4, answered by a palindromic structure that is primarily quintuple (5,5,4,5,5); the larger structure is a forty-pulse phrase (16,24). The expected repetition is altered when a lower-level repetition of the first sub-phrase of the palindrome (5,5,4) emerges from the middle of the overarching phrase. This local pivot and repetition establish a new fourteen-pulse structure, expanding the forty-pulse model into a forty-four-pulse variant.

The bridge and final chorus of Amos’s “Spark” are complicated by the presence of two metric pivots in relatively close proximity (see **Ex. 6.13**). The first pivot is a straightforward example of the most common type of structure (noted above): the first four phrases alternate lengths of twelve and

¹⁰ Because we are concerned with metric structure, rather than grouping structure, the absence of annotations at the deepest hierarchical level following these three pivots simply implies that the second groove does not continue for long enough to establish patterning at that depth (cf. “Undertow”).

thirteen beats, forming a larger repeating pattern of twenty-five beats; the fourth phrase is repeated as an instrumental, establishing an independent, thirteen-beat cycle. In its entirety, this first half of the bridge occupies sixty-three beats (12,13)(12,13,13). The second half begins with a return to the initial, twenty-five beat pattern, but change arrives earlier—before the alternation of twelve and thirteen is established by a full repetition. The third phrase has the expected duration of twelve beats, as does every subsequent phrase through the chorus. Moreover, because of a lyrical ambiguity, it is difficult to assert where the bridge ends and the chorus begins. The final phrase of each half of the bridge is a variant of the lyrics that initiate all of the song’s choruses: “Say you don’t want it.” Two metric-structural readings seem plausible, both with their ambiguities. In the first, the initial five-phrase half of the bridge is balanced by a second five-phrase half but, where the former ended with two thirteen-beat phrases, these are shortened to twelve beats each in the latter half. The final (tenth) phrase of the bridge is the site of a structural pivot (though not a metric one, as the meter has settled into a twelve-beat cycle): it supplies both the final phrase of the bridge and the first of the chorus simultaneously. The second reading (transcribed in **Table 6.3**) sees the thirteen-beat extension in the first half of the bridge balanced by the twelve-beat third phrase of the second half. Both phrases are isolated within the otherwise twenty-five beat pattern and, taken together, they add to twenty-five. Because the order in which the two phrases occur (13 before 12) is the inverse of the patterned cycle (12,13), we can understand the thirteen-beat phrase to have arrived early; its proper place in the structure would be at the close of the second half. The chorus in this reading begins with the first “Say you don’t want it.” This phrase is the site of a metric pivot, retaining the meter of the last twelve-beat phrase in the bridge in the absence of the prematurely deployed thirteen-beat phrase.

My final example of a metric transition comes from a bridge in Tool’s “Rosetta Stoned” (see **Ex. 6.14**). Instead of a metric pivot, localized to a single measure or phrase, the entire formal section participates in the pivot through a series of overlapping displacement and grouping dissonances. The resulting passage can be counted *almost* entirely in a single meter (5/8), troubling our ability to identify the location of the IMI that necessarily interferes with the meter. The time signatures in my transcription support the most conservative hearing, remaining in 5/8 through many conflicting metric cues until the guitar aligns with the vocals in the final measures. The vocals are the most stable layer, asserting the same (2,3) cycle from the moment they begin through the end of the section. However, because the vocals enter four measures after the guitar and drums, they can be

J = 224

Voice Electric guitar Drums

192 continues

I'm out of my head Am I alive? Am I dead? Can't remember
 (guitar continues) tabla sample

197 continues

ber what they said God damn shit the bed

aligns

Example 6.14: A complex metric surface, obscuring the location of an isolated metric irregularity in Tool's "Rosetta Stoned" (2006).

heard as a D5+2 displacement dissonance against the established guitar rhythm (as can the drums up to this point), rather than as primary. Complicating matters further, once all three layers are present, the drums soon abandon their initial quintuple pattern for a sextuple cycle (containing an internal G4/3 grouping dissonance), which is repeated five times to form an overarching G6/5 grouping dissonance with the continuing vocals. The guitar aligns with the vocals after the drums have shifted to this new cycle. There are several plausible moments at which we might identify an IMI, including the first measure, the vocal entry, or the measure I have transcribed in 7/8. Finally, at a deeper level,

is possible to identify the final thirty eighth notes as a metric pivot between the ongoing quintuple strands and the impending groove—a slow triple meter that retains the sextuple drum cycle. Teasing apart the complex metric cues in this short excerpt from “Rosetta Stoned” requires a veritable arsenal of theoretical concepts.

Inconsistent Irregularities

Metric irregularities of the inconsistent type comprise song sections in which isolated irregularities are prevalent or varied enough to overwhelm our sense of an underlying (would-be-regular) meter. I consider twenty-two passages across thirteen songs from the corpus that satisfy this definition, but the boundary delineating these from other complex examples is oftentimes fuzzy. Certain examples from the preceding discussion of metric pivots, for instance, could be understood to comprise inconsistent irregularities. Thus, before discussing the inconsistent approaches found in the corpus, I formalize the relationship of inconsistent irregularities to other familiar types of metric irregularity.

THEORIZING INCONSISTENT IRREGULARITY

Figure 6.6 compares four irregular metric structures: repeating or cyclic irregular patterns, which account for both the cardinal (type 1) and sectional (type 2) categories; isolated irregularities (IMIs); metric pivots; and inconsistent irregularities. Many of the theoretical observations made so far in this dissertation can be extrapolated from this succinct representation. For instance, from a high-level structural perspective, cyclic irregular patterns are related more closely to cyclic regular meters than to isolated irregularities. Likewise, because the structures represented here are not yoked to a particular hierarchical level, we can infer structural relationships between irregularities at all levels of hierarchy. These structural affinities are telling, but they have their limits. Although I mostly map only a single level of analysis, hierarchy has an important role to play in making distinctions between cases that fall near a categorical boundary. The relationship between IMIs and metric pivots exemplifies this, as the latter requires that we identify patterns at a second hierarchical level. Without identifying the repetition of unit “b” at a lower level, the (A,A,b) structure of the metric pivot would be indistinguishable from the IMI template (A,A,B).

Hierarchy also has an important role to play in the identification of inconsistent irregularity. The simplified inconsistent template of **Figure 6.6** suggests that what distinguishes this type of structure is the absence of any repeated metric patterning—a common feature among all other irregular

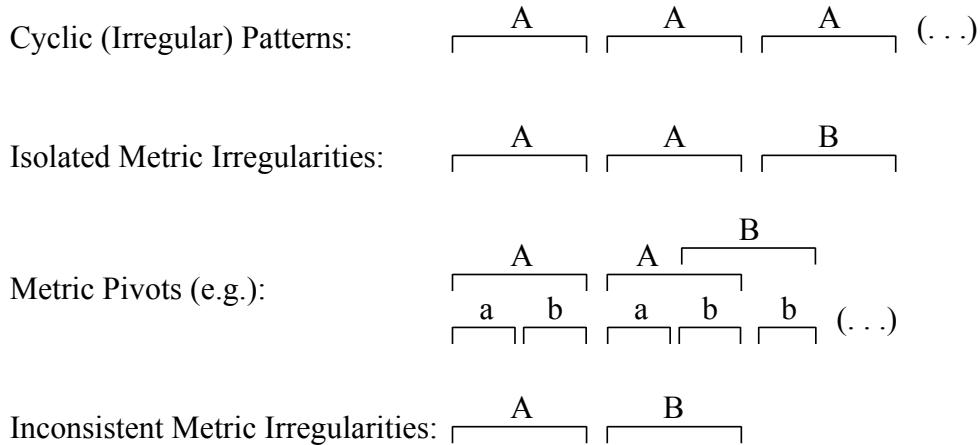


Figure 6.6: Templates for four irregular metric structures, independent of hierarchical level.

structures. As we zoom in on any specific inconsistent structure, however, we are almost certain to find repeating elements at a lower hierarchical level. On the one hand, one of the most common inconsistent structures evinces an (a,b)(a,c) succession at some level, and this is easily folded into the (A,B) template one level higher. The only recurring element (a) is never repeated immediately and thus never prompts entrainment. On the other hand, the same inconsistent (A,B) template could play host to a lower-level pattern like (a,a)(a,b), which implies a repeating pattern ending with an IMI rather than an authentically inconsistent structure.¹¹ When an example presents conflicting definitions of irregular type at various hierarchical levels, I ignore potential templates that occur below the metric level; in predominantly compound meters, I delve no lower than the dotted quarter. Amos's frequent juxtapositions of 6/8 and 7/8 afford a simple example: in assessing a short, hypothetical formal section with (6,7) metric structure (arising, for instance, between two 4/4 verses), I would conclude that the passage was inconsistent despite sub-metric (3,3)(3,4) patterning.

A second potential complication concerns the metric changes of a given passage, which can often be modelled in several distinct ways. The descriptive potential of the time signature helps us to concretize the issue. As an example, recall the excerpt from Dream Theater's "Home" (**Ex. 6.1**). I offered three interpretations of the passage, which can be represented as:

1. 4/4 | 2/4 | 4/4 | 15/16,
2. 3/4 | 3/4 | 3/4 | 19/16 (= 2/4 | 2/4 | 3/16), and

¹¹ It is a natural property of metric hierarchy that distinctions of this nature can often be deferred to a lower hierarchical level but seldom avoided entirely. For instance, the convincingly inconsistent (a,b)(a,c) model might comprise a lower level of ((x,x)(x,y))((x,x)(x,z)).

3. 3/2 | 3/2 | 7/16.

Each of these has a clear correspondence with one of the templates in **Figure 6.6**: the first interpretation is inconsistent (A,B)(A,C), while the second (A,A)(A,(b,b,c)) and third (A,A,B) both involve an IMI. Above, I asserted that all three hearings have their merits; I analyzed the passage as belonging to the isolated type rather than the inconsistent because I believe listeners are drawn to a more structurally stable interpretation when available.

One crucial feature of metric structure not shared by all three interpretations is a relative uniformity of measure length. The isolated measure of 2/4 in interpretation one is half the length of the surrounding measures (a feature it shares with many IMIs in 4/4 contexts). More striking is the IMI that ends interpretation three, which has less than one third the span of the preceding cycle. In assessing inconsistent metric irregularities, it is important to establish a rough limit as to how unequal two adjacent spans can be before we reject their comparability within a potential interpretation. When listening, I find myself able to straddle two adjacent levels of metric hierarchy, but not three. For example, within a context dominated by measures of 4/4 and 7/8, I would likely default to grouping an isolated group of three eighth notes as a self-contained span (a measure of 3/8 time), whereas a two-eighth-note group would prompt me to extend the preceding measure (4/4 becomes 5/4 or 7/8 becomes 9/8). If the predominating metric fabric instead comprised 6/8 and 7/8, a 2/8 measure might be viable. In all of these hypothetical cases, grouping preferences based on melodic and harmonic cues can prove decisive, as can nuances of arrangement and production. These distinctions will be clarified as we examine excerpts from the corpus.

ANALYZING INCONSISTENT IRREGULARITY

The (A,B)(A,C) Template

As with isolated metric irregularities, inconsistent irregularities are generally diverse, but one archetype emerges. Of the twenty-two passages that meet my definition, nine follow the aforementioned (A,B)(A,C) template (see **Table 6.4**).¹² What is more, these examples all involve changes in sub-metric grouping. This trend is borne out by other inconsistent passages, which rarely evince a consistent sub-metric pulse. The scale of the examples listed ranges from four to thirty-four

¹² Only eight passages are listed because the first—the chorus of Ben Folds’s “Bastard”—occurs twice in the song. The other entry from the same song is the final chorus, which is identical to the first two apart from a single-beat extension.

Metric Structure	Artist—Song (year)
7/8 (x2) 3/4 (x2) 7/8 (x2) 3/4 4/4	
7/8 (x2) 3/4 (x2) 7/8 (x2) 3/4 5/4	Ben Folds—“Bastard” (2005)
7/8 9/8 7/8 10/8	
5/8 7/8 5/8 7/8 5/8 6/8 3/4 6/8 3/4 5/8 7/8 5/8 7/8 5/8 (x2) 7/8 3/8 5/8 7/8 5/8 7/8 5/8 6/8 3/4 6/8 3/4 5/8 7/8 5/8 7/8 5/8 (x2) 7/8 5/8	Dream Theater—“Metropolis Part 1: The Miracle and the Sleeper” (1992)
5/8 (x2) 5/4 5/8 (x2) 4/4	Tool—“Swamp Song” (1993)
7/8 8/8 7/8 3/8	Tool—“Eulogy” (1996)
7/8 8/8 7/8 4/8	Tool—“Parabola” (2001)
6/8 2/4 6/8 (x2) 6/8 2/4 6/8 7/8	Tori Amos—“Hotel” (1998)

Table 6.4: List of inconsistent irregular passages with an (A,B)(A,C) structure in the corpus.

measures. The shortest include two very similar structures in Tool’s “Eulogy” and “Parabola”; the (A,B)(A,C) structure is apparent when each subdivision comprises exactly one measure. Slightly longer passages are typically based on two-measure patterns—either changing meter every other measure, as in both examples from Ben Fold’s “Bastard,” or varying the second measure of every pair, as in Amos’s predominantly 6/8 “Hotel.”

One of the listed excerpts stands apart from the others for its length, occupying thirty seconds of a long instrumental late in Dream Theater’s “Metropolis Part 1: The Miracle and the Sleeper” (see **Ex. 6.15**). The large-scale (A,B)(A,C) structure of this example resembles some of the larger split structures examined in Chapter 5 (cf. **Table 5.5**). The passage is primarily made up of recurrent rhythmic elements, which form larger metric blocks. My use of time signatures in the transcription emphasizes the melodic line emerging atop a compound melody doubled in octaves. Brackets below the drum part show how the undifferentiated patterns articulated by various cymbals (supported by kick drum) move in and out of alignment with this melody. The first highlighted moment in my example (yellow oval) shows the initial misalignment of layers, forming a D12+5 displacement dissonance between two iterations of the same (3,2)(3,2,2) succession. In the sixth measure, the melody shifts to a less syncopated pattern, alternating between 6/8 and 3/4 (a longer span of the same metric idea governs the section that immediately precedes the example). The downbeat of this new structure aligns with that of the continuing drum pattern, which syncopates against the more metrically stable melody. In the “B” passage, the drums finally align with the melody as it returns to the (5,7) cycle. The two parts continue together even when this cycle is interrupted by irregular fragments.

$\text{♩} = 394 (\text{♩} = 197)$

Electric guitar Drums

A 12 ♩ (3,2)(3,2,2) (doubled by synth 8va and bass 8vb)

Fragment New subdivision (3,3)(2,2,2)

hats semi-open

12 ♩ (3,2)(3,2,2); D12+5 displacement

B 240 Original subdivision; layers align Fr.

small china

12 ♩ 247 Fr. A As before

ride bell

6 ♩ pattern hands inverted

guitar (doubled by bass 15vb) C

large synth

large china

255

261 large stax small stax

Example 6.15: Large-scale (A,B)(A,C) structure and relevant details of an instrumental in Dream Theater's "Metropolis Part 1: The Miracle and the Sleeper" (1992).

The melody of the second "A" passage is almost an exact repetition of the first. The drum accompaniment is also quite similar, but the earlier displacement is complicated by a subtle variation

(see the second highlighted moment). The addition of an anacrusis on the eighth of every twelve eighth notes (anticipating the ninth) complicates the groove in two ways. First, if we treat the first cymbal stroke of each adjacent pair as primary, the drum pattern aligns with the melody. This is a rather unintuitive way to hear the drum part, so the result is more of a theoretical alignment, in which the drums simultaneously repeat their earlier displacement while better supporting the melody's succession. The second feature of this new pattern is a nested, six-eighth-note paradiddle variant: (RLLRLR)(LRRLRL), where (R) denotes drummer Mike Portnoy's right-hand sticking of the ride-cymbal bell and (L) denotes his left on the snare.¹³ The emphasis that this pattern places on the six-eighth-note span anticipates the return of the 6/8 + 3/4 passage, and it may encourage some listeners to entrain momentarily to a regular quarter note (or dotted quarter-note), instead of following the complex succession of 2s and 3s.

In terms of surface-level rhythmic articulations, passage “C” is more similar to “B” than the two “As” are to one another. The drum pattern is repeated exactly, using a greater variety of cymbals, and extended by two eighth notes. Without this extension, the excerpt would comprise two cycles of a split irregular pattern. Despite the harried pace of the music, compounded by locally disorienting details like the displacement dissonances in the “A” passages, the recurrence of identifiable melodic motives and rhythmic successions allows us to identify an overarching (A,B)(A,C) structure, related (at least theoretically) to the other examples listed in **Table 6.4**. The downbeat that follows the transcribed excerpt—easily identified in the listening excerpt by a guitar bend to E5—initiates a new, sub-metric quintuple cycle, thus marking the end of the inconsistent span.

Amos’s Mild Inconsistencies

Three songs by Tori Amos contain sections that straddle the line between inconsistent irregularities and regular meters in conjunction with IMIs (see **Table 6.5**). These examples reveal techniques through which measures in familiar meters can be assembled to form strikingly disorienting successions. Moreover, two of the three songs confine their irregularities to the metric level, realizing complex metric structures while maintaining a consistent beat.

The verses of “Fast Horse” are the most unassuming of the three examples. The first verse is easily parsed in triple meter with only occasional IMIs: the second measure of the second phrase is

¹³ A standard paradiddle is (RLRR)(LRLL). When played across different drums, as in the example, paradiddle-family rhythms afford unique accent structures in regular and irregular meters alike.

Form	Metric Structure	Song (year)
Outro	3/2 3/4 (x2) 4/4 (x2) 4/4 3/4 (x3) 5/4 5/4 3/4 (x3) 4/4 (x2)	“Professional Widow” (1996)
Verse	6/8 7/8 (x2) 9/8 6/8 7/8 (x 2) 6/8 5/8	
Prechorus	7/8 (x2) 6/8 (x2) 8/8 7/8 6/8 (x2)	“Barons of Suburbia” (2005)
Chorus 1	7/8 6/8 (x3) 6/8 (x4) 7/8 6/8 (x3)	
Chorus 2	7/8 6/8 (x3) 6/8 (x2) 7/8 6/8 7/8 6/8 (x3)	
Verse 1	3/4 (x4) 3/4 2/4 3/4 (x2) 4/4 (x2)	
Verse 2	3/4 2/4 (x2) 3/4 (x2) 3/4 (x2) 2/4 3/4 4/4 (x2)	“Fast Horse” (2009)

Table 6.5: Non-(A,B)(A,C) inconsistent structures in three songs by Tori Amos.

[audio ex. only]

Example 6.16: Inconsistent irregularity in the second verse of Tori Amos’s “Fast Horse” (2009).

[audio ex. only]

Example 6.17: Inconsistent irregularity in the outro of Tori Amos’s “Professional Widow” (1996).

compressed by a beat, while the final two measures shift to 4/4 time. The placement of the 2/4 measure so early within a phrase is unusual but not so irregular as to destabilize the prevailing 3/4. In the second verse, the isolated irregularities are compounded by a modification early in the first phrase—the second and third measures are in 2/4 time (see **Ex. 6.16**). Without the stability of a consistently triple first phrase, it is far more likely that listeners hear the second verse as generally inconsistent. Triple meter remains the most prevalent metric influence through the passage for three reasons: counting measures reveals that it is the most frequent structure; listeners will retain expectations from the first verse; and a three-measure instrumental vamp immediately re-establishes triple meter following the 4/4 chorus. Nevertheless, the placement of irregularities early in both phrases, coupled with phrase-to-phrase variation and the recurrence of the late shift to 4/4, results in a substantially irregular passage.

Predating “Fast Horse” by over a decade, the outro of “Professional Widow” contains a passage that anticipates several features of the more recent song’s verses (see **Ex. 6.17**). As a whole, the outro (an expanded version of an earlier bridge) emphasizes triple meter, contrasting with most of the rest of the song, in 4/4. The first phrase of the section is primarily in 3/4, ending with a two-beat IMI, and the final measures of the song settle into a consistent 3/4 groove. Three intervening phrases are more complex. The entry of the drums, following the IMI of the first phrase, initially suggests some ambiguity: six undifferentiated (or weakly differentiated) beats articulated by kick drum and various cymbals afford either a retention of two-beat grouping or a return to the three-

Formal Section	introduction		verse 1		prechorus	
Hypermeasure	regular	2	irregular	29, 31	regular	26, 27, 32
Measure	regular	2	irregular	13, (16, 18)	irregular	(14), 12, (15)
Dotted Quarter / Half Note	regular	2	irregular	(6), 7, (9, 5)	irregular	7, 6, (8)
Eighth Note	regular	3	irregular	3, (4, 2)		

chorus	interlude		verse 2 + prechorus		chorus	inst. + refrain
irregular 25, (24)	regular	2	as before		regular 25	regular 2
irregular (13), 12	regular	2			irregular 13, 12	regular 2
irregular (7), 6	regular	2			irregular (7), 6	regular 2
(irregular 3, (4))	regular	3	irregular	3, (4, 2)		regular 3

Table 6.6: Metric hierarchy and regularity by formal section in Tori Amos’s “Barons of Suburbia” (2005).

[audio ex. only]

Example 6.18: Inconsistent irregularity in the verse and prechorus of Tori Amos’s “Barons of Suburbia” (2005).

beat cycle. Triple meter is subsequently reestablished unambiguously but only briefly—the final measures of the phrase shift to 4/4. Instability at phrase boundaries continues through the next two phrases. The preceding 4/4 meter is retained for a measure, 3/4 returns momentarily, and the final measure is in 5/4. The same strategy is then repeated as the final irregular phrase begins with another measure of 5/4. As we observed in “Fast Horse,” the placement of irregular measures at or near the beginning of phrases has an inherently destabilizing effect. In “Professional Widow,” this effect is compounded through the coordination of phrase-initiating irregularities and adjacent phrase-ending irregularities, pitting potentially cyclic metric structures (three consecutive measures in 4/4 and two in 5/4) against deeper subdivisions implied by phrase structure.

My third example by Amos, “Barons of Suburbia,” is remarkable insofar as nearly every texted section of the song involves irregularities, ranging from disruptive IMIs to fully inconsistent sections (see **Table 6.6**). As in the previous two examples, Amos establishes a regular expectation (compound duple time) before engaging in inconsistent metric manipulations. The first verse begins like many Amos passages, with a thirteen-pulse structure with (6,7) subdivision (see **Ex. 6.18**). Rather than continue to alternate measures of sextuple time with others, Amos retains the septuple idea before further expanding the fourth measure to nine pulses. The verse’s second phrase begins like the first but is expanded still further (nine is overwritten by six + five). The prechorus is somewhat simpler, proceeding in two-measure units and forming a near-repetition in its first two

phrases: ((7,7)(6,6))((8,7)(6,6)). Six measures of sextuple time follow, returning the regular meter before the chorus. Apart from this brief respite, the verse and prechorus are shot through with irregularity. It is perhaps because of this intense, inconsistent irregularity that the metric structure of both sections is repeated verbatim on a second pass.

The choruses of “Barons” are markedly more regular than the song’s other texted sections, though they too pose a distinct metric question. In the first chorus, two 7/8 IMIs open the first and third of three four-measure phrases. The meter is otherwise uniformly 6/8, making the measure level almost entirely regular. In the second chorus, regularity lies at the phrase level. The second phrase is expanded by a pulse to match the other two; however, the location of the new 7/8 measure is not the same as the others (at the start of the phrase). Whereas the first and third phrases follow the model of the first chorus (7,6)(6,6), the second phrase runs (6,6)(7,6). Thus, although each of the three phrases spans 25 pulses, their internal subdivisions are irregular. The irregularity of the second chorus affects every hierarchical level in subtly different ways. “Barons” exemplifies Amos’s metric dexterity, navigating metric contexts ranging from regular (intro, interlude, instrumental, and refrain) to inconsistently irregular (verses and prechoruses), as well as various intermediate options (two slightly different choruses).

“Sail to the Moon”

My last example of inconsistent irregularity introduces new considerations that, while uncommon within the corpus, are illustrative of complications for metric analysis more broadly. In Radiohead’s “Sail to the Moon (Brush the Cobwebs out of the Sky),” our ability to comprehend the logic of two inconsistent irregular sections with drums rests on analysis of passages without them. Moreover, the song’s inconsistent passages are rendered logical through deeper-level consistencies and through the narrative affordances of metric structure.

The instrumental intro of “Sail to the Moon” begins with a complex metric sequence that neither repeats internally, nor returns later in the song (see **Ex. 6.19**). Nevertheless, a clear and consistent pattern underpins the changing meters of the passage, expressed by Osborn (2017, 67) as follows: “Each hypermeasure is a palindrome $x-y-x$, with the meter of y remaining constant at 2/4 for each hypermeasure, while the number of beats per measure in x decreases from 7/4 to 6/4 to 5/4 from one hypermeasure to the next.” The pattern is evident in a bracket representation of the full series of changes, (7,2,7)(6,2,6)(5,2,5). It would be easy to overlook the internal logic of the passage, were we focussed too narrowly on the song’s shifting drumbeat cues—the drums are tacet

[audio ex. only]

Example 6.19: Inconsistent irregularity with consistent internal logic in the intro of Radiohead’s “Sail to the Moon (Brush the Cobwebs out of the Sky)” (2003).

Form				Other	
Rotation	Vamp	Verse	Chorus	Drumkit Presence	Expressive Implication
1	4/4 (x4)	4/4 (x3) 2/4	3/4 4/4	Tacet	Stable – essentially the same pattern twice
2	4/4 (x2)	4/4 (x3) 2/4	3/4 (x2)	Subtle	
3	5/4 (x4)	4/4 (x3) 2/4	3/4 4/4	Full	
4	4/4 3/4	4/4 3/4 4/4 2/4	3/4 4/4 4/4 2/4 (all x2)	Full	Unstable – significant changes in both rotations
5	5/4 (x8)			Continues through first measure	Changed – residue of initial irregularity

Table 6.7: Rotational form in Radiohead’s “Sail to the Moon (Brush the Cobwebs out of the Sky)” (2003).

for the first five measures of the song.¹⁴ This is not the only instance in “Sail to the Moon” when our understanding of metric irregularities with drums relies on patterns established without them.

Following the unique compromise in the intro between persistent change (marking irregularity) and sustained patterning (a type of regularity), the rest of the song follows a rotational formal structure fairly typical of rock music (see **Table 6.7**). The shortening palindrome length in the intro is paralleled by metric modifications from one rotation to the next—becoming progressively more disruptive with each rotation. The first two rotations establish metric expectations for subsequent rotations and introduce two characteristic metric ideas. The first of these is a section-ending IMI of 2/4 in a 4/4 context (associated with the verse, tagged in green in the table). The second metric idea (tagged in orange) marks the chorus, which always begins with a measure of 3/4 and usually continues with a measure of 4/4.¹⁵ The exception to the (3,4) chorus pattern is the second chorus, which is compressed by a beat (3,3) through the early arrival of a new vamp section (in 5/4, tagged in red). The specific meters involved can be seen to balance one another: the chorus loses a beat,

¹⁴ The shorter passage with drums, beginning with the second measure of 6/4, is itself inconsistently irregular (3,3)(3,2, 2)(3,2). No analysis of this fragment approaches the elegance of Osborn’s explanation of the larger excerpt.

¹⁵ Because of the slow tempo and the resulting brevity of the chorus, the first instance of this section could be understood as inconsistent (lacking metric-level stability), but the same brevity makes it exceptional among inconsistent examples.

$\text{♩} = 56$

The musical score consists of three sections: Chorus 3, Verse 4, and Chorus 4. The vocal part (Voice) and the drum part (Drums) are shown. The vocal part includes lyrics such as "(know) right from wrong" and "or in a flood" in Chorus 3; "you will build an ark" and "and sail" in Verse 4; and "us to the moon" and "sail" in Chorus 4. The drums provide a constant rhythmic foundation. Metric signatures change frequently, indicated by numbers above the staff (e.g., 3, 4, 7, 13). Measure numbers are also present above the staff.

Example 6.20: Metric inconsistency through several adjacent formal sections in Radiohead’s “Sail to the Moon (Brush the Cobwebs out of the Sky)” (2003).

while the vamp cycle gains one (cf. the 4/4 vamp of earlier rotations, in blue). Coinciding with the first full drumbeat since the intro, this new 5/4 vamp marks a metric change that affects the entire formal section; this loosens the rotational fabric, encouraging further irregularities in the following rotation. The rest of rotation three is unaffected, continuing as a repetition of rotation one.

Rotation four is the site of the most inconsistent metric successions in all of “Sail to the Moon.” In fact, beginning with the previous section (chorus three), the meter changes nearly every measure and seldom repeats a span of any length until reaching the final (fourth) chorus (see **Ex. 6.20**). Many potential explanations come close to making sense of the passage, but none is satisfactory on its own. For instance, the seven-beat chorus could be seen to initiate a new septuple model for the vamp and verse, but the (3,4) structure of the chorus is inverted (4,3) in the following sections (tagged in yellow). Likewise, the fourth verse and chorus come close to forming a thirteen-beat cycle, but the internal subdivisions again differ in the details. The best explanation for the new

metric structures requires a holistic view of the song. The change to the fourth vamp parallels the earlier compression of chorus two: the (4,4) structure of vamps one and two is replaced by (4,3), just like the (3,4) chorus model shrank to (3,3). This new septuple model is retained for the first half of the following verse, in the same way that the regular 4/4 meter of vamps one and two carried on into their respective verses. (I will return momentarily to the exceptional relationship of the third vamp and verse.) The second half of verse four returns to the model of earlier verses, ending with a 2/4 IMI. This fourth verse is thus the first section to fuse elements from two earlier sections (vamp four and verses one through three). The fourth chorus continues this process of formal fusion, beginning like choruses one and three and extending the structure by reprising the verse-ending 4/4+2/4 figure. In a familiar move, this final chorus is further extended through doubling—in this case creating a thirteen-beat cycle of the fused (3,4)(4,2) model.

A narrative interpretation of meter in “Sail to the Moon” is readily suggested by the gradual acceleration of metric changes and the resulting increase in metric inconsistency (see the rightmost column of **Table 6.7**). The first two rotations denote the established order or status quo, with local irregularities suggesting latent tensions. The most irregular part of the second rotation, the chorus, provides an opportunity for change, the agent of this change being the sustained quintuple groove that interrupts the chorus. Counteracting the early success of the 5/4 groove, the established order reasserts itself through the remainder of rotation three. The fourth rotation comprises attempts at compromise: a change to the vamp is modelled on the earlier chorus modification and metric ideas from different formal sections fuse to create new patterns, both regular (the thirteen-cycle of the final chorus) and irregular (the intervening verse). In the end, this process of compromise leads to sustained change, marked by a return to the inciting 5/4 meter. In this narrative, the drums can be read as a supporting agent, arriving in full force to enable transformation and compromise, and exiting only after the first 5/4 measure of the outro groove, when change is securely established. The shift in “Sail to the Moon”—from established order, through conflict and compromise, to a sustained resolution—is a textbook example of transvaluation, or “changing hierarchical relationships and oppositions [that can denote] culturally meaningful differences” (Almén 2008, 41).¹⁶ In the context of the song’s lyrics, described by Phil Witmer as a “fairy tale [for Thom Yorke’s] then-newborn son Noah [in which] Yorke hopes that the boy will grow up to be a president who’ll

¹⁶ The transvaluation term is originally Liszka’s (1989); the concept features prominently in Almén’s theorization of musical narrative.

“know right from wrong,” my metric analysis supports the great positive potential Yorke sees in his son.¹⁷

This chapter completes our overview of the metrically irregular structures of the corpus and the drum practices with which they are associated. The most consistent trends among IMIs are (1) the incredible variety of possible combinations of metric context, irregular meter, phrase and formal location, and drumbeat; (2) the prevalence of the backbeat and the super-metric level, corresponding to trends in rock music more generally; and (3) a marked inclination towards phrase-end placement. Inconsistent irregularities, though far fewer in number, exhibit the same variety as IMIs. Moreover, the unfamiliar structures implied by inconsistent passages helps to clarify distinctions between these and other irregular types—repeating, isolated, and metric pivots. Generally speaking, the knowledge gained from drum conventions in repeating irregular grooves (Part II) provides an important foundation when considering isolated and inconsistent types, but many of the examples reviewed in this chapter abandon familiar patterns to accommodate drum fills or short rests. The full-song analyses of the final chapter help us to contextualize the different types of metric irregularity we have encountered and suggest potential extensions of this project.

¹⁷ See “Radiohead’s ‘OK Computer’ Is 20, But Let’s Talk About ‘Hail to the Thief’ Instead,” *Noissey*, https://noissey.vice.com/en_uk/article/d7a3jj/radioheads-ok-computer-is-20-but-lets-talk-about-hail-to-the-thief-instead, accessed June 5, 2018.

— 7 —

Metric Irregularity in Practice

In the preceding chapters of this dissertation, I relied on trends aggregated from analyses of 240 songs to demonstrate the intricate relationships between metric structure and drumbeat. These trends have reinforced established truisms: 4/4 time is by far the most pervasive meter in Euro-American popular genres; the backbeat is an essential feature (some might say *the* essential feature) of rock rhythm, even in metrically irregular contexts; rock and metal are, on balance, more metrically irregular than top-40 pop; and, extrapolating from Murphy (2016), irregularities serve an ending function more often than an initiating or mediating one. Analysis of the corpus also facilitated new insights about metrically irregular rock: metric irregularities can be profitably categorized according to hierarchical level or type (cardinal, sectional, isolated, combined types, or inconsistent); tresillo successions and triple meters employ many of the same drumbeat templates; irregular patterns of different cardinalities differ considerably with respect to drumbeat practice; and, although certain irregular drumbeat patterns are common and offer a substantial scaffold for understanding both metrically irregular subdivisional structures and drumming practices, there remain ambiguities and innovations within this metric-generic space. I introduced new theoretical tools to model some of the most characteristically irregular metric phenomena encountered. The distinction between punctuated and split irregular patterns, for example, is especially useful in modeling larger cyclic irregularities and relating them to shorter, familiar irregular patterns. Likewise, my conception of metric pivots establishes a structural logic for a specific type of irregular overlap. In these cases, as in many others, drum articulations are indispensable in understanding complex metric ideas.

While the data-driven generalities of the corpus have been foundational to my theoretical observations, I have striven throughout this project to highlight the particularities of as many exceptional and ambiguous songs as space permits. In this final chapter, the analytical imperative takes centre stage as I conclude this project with three full-song analyses, one by each of the core artists from the corpus. In the first vignette, Tool’s “Schism” showcases many irregular structures, often referencing examples from earlier chapters while weaving together a broader analytical perspective. The next two analyses are entirely new and step outside of the corpus, suggesting how

the findings of this dissertation might inform future work. Radiohead’s “Decks Dark” emphasizes the significance that a band’s idiolect can have for metric analysis (a theme that runs through all three analyses). Most features of the song are familiar from earlier discussions of Radiohead; however, my analysis also draws attention to apparently new metric ideas within Radiohead’s output. Lastly, Tori Amos’s “Icicle” represents a portion of the artist’s work not considered in the corpus—her numerous recordings without drums. I show that familiar metric types and structures remain relevant in the absence of a drumbeat. Moreover, through the artificial addition of drums to a highly ambiguous passage, I reinforce the impact that drums can have on a listener’s metric interpretation.

Tool’s “Schism”: Summary of Irregular Types and Interactions

The fifth track on Tool’s third studio album (*Lateralus* 2001), “Schism” exemplifies the intersection of metrically transgressive songwriting and commercial viability. “Schism” was the only Tool single to chart on “The Hot 100,” peaking at 67 in September 2001, and was among the band’s best performers on other Billboard charts (e.g., holding #2 on “Mainstream Rock Songs” through June–August 2001, and spending as much time near the top of “Alternative Songs,” peaking at #2 in August). Critical praise and fan enthusiasm for the extensive metric irregularity of “Schism” are abundant, as illustrated by user Bartender’s 5.0 review in *Sputnik Music*, in which he calls the verse riff “one of the most instantly loveable basslines I’ve ever heard—it’s not so much a hook as a harpoon; it *will* get stuck in your head.”¹ The *Wikipedia* entry for the song attests that “‘Schism’ is renowned for its use of uncommon time signatures and the frequency of its meter changes,” and suggests, following Adam Perlmutter’s (2001) transcription in *Guitar One* magazine, “the song alters meter 47 times”—a claim parroted in many online descriptions and discussions of the song.² It also seems that “Schism” has aged well: in 2014, the song took the top spot in a reader poll by *Ultimate-Guitar.com* based on the prompt “name a track that rhythmically blows your mind”; a fifteenth-anniversary retrospective of *Lateralus* by Diane Woodcheke (2016) celebrated “Schism” as “a deep

¹ 2005, “Tool: Lateralus,” <https://www.sputnikmusic.com/review/83/Tool-Lateralus/>, accessed March 21, 2018. Emphasis in original.

² *Wikipedia*, s.v. “Schism (song),” [https://en.wikipedia.org/wiki/Schism_\(song\)](https://en.wikipedia.org/wiki/Schism_(song)), accessed March 22, 2018; my analysis differs from Perlmutter’s in several respects, most notably insofar as I discuss conflicting interpretations—a strategy not appropriate in the context of a guitar magazine transcription.

and complex song filled with meticulous time signatures"; and an orchestral arrangement by Nick Proch appeared on YouTube later the same year.³

The significance of the metric irregularities and frequent meter changes in "Schism" can be understood as responding not only to the song's lyrics but also to the circumstances surrounding the song's composition. The lyrics seem to be inspired by specific events and tensions in the lives of the band members, but sublimate the particulars into a simpler, relatable theme. In "Schism" this theme concerns a breakdown of communication "between supposed lovers" and frustration with the disconnect, despite "pure intention." Several of the band's dealings in the years leading up to the release of *Lateralus* (2001) are reflected in the lyrics of "Schism" and these connections are reinforced by interviews following the album's release.⁴ Three points bear rehearsing here: (1) Tool's normal creative approach sees four separate but intertwined creative personalities engage in a gradual process based on repetition and compromise, leading eventually to consensus; (2) frontman Maynard Keenan acknowledged that his work with A Perfect Circle, including the release of *Mer de Noms* in 2000, may have prompted fears that he would leave Tool—"we're all satellites, we're all just doing our own thing" (see the interview cited in footnote 4); and (3) tensions between Tool members, their record label (Volcano Entertainment), and their manager (Ted Gardner) escalated through the late 1990s, culminating in several lawsuits and Gardner's dismissal.

In view of these tensions in the band's history, the varied metrical structures of "Schism" support numerous interpretations of the song's title. Two-part structures, including several prominent split irregularities (the name seems conspicuously appropriate in this context), recall the most common, ecclesiastical usage of the word "schism"—a division into two factions. If understood as denoting binary oppositions between individuals or groups, such passages can be mapped onto the tensions between Keenan and the rest of the band, between the band and their label, or between the band and Gardner. Other passages in "Schism" demand more complex subdivision, exhibiting the sort of fractured, kaleidoscopic multiplicity that band members describe

³ UG Team, 2014, "Top 10 Weirdest Odd-Time Signature Songs," https://www.ultimate-guitar.com/news/wtf/top_10_weirdest_odd-time_signature_songs.html, accessed March 21, 2018. Woodcheke, 2016, "Tool's Lateralus 15 Years Later," *Cryptic Rock*, <https://crypticrock.com/tools-lateralus-15-years-later/>, accessed March 21, 2018. Proch, 2016, "Tool—Schism (Orchestral Arrangement)", YouTube, <https://youtu.be/0vC1KTCgaME>, accessed March 21, 2018.

⁴ The members of Tool are notorious for avoiding interviews, cancelling at the last minute, and directing topics of conversation away from their personal lives and towards their creative process. Several of the band's recorded interviews are collected in the following video: <https://www.youtube.com/watch?v=sp7PJKhSEK8> (huntingtonst1, 2011, "Tool—More Interviews," YouTube, accessed March 26, 2018); most relevant to this discussion are two interviews concerning *Lateralus*, beginning at 33:02.

Formal Section	introduction (fermata)		verse	instrumental		verse + inst.	bridge	
Hypermeasure	once	2	regular	2	regular	2	regular	2
Measure	regular	16	regular	12	regular	13	regular	3
Quarter Note	irregular	6 (4)	irregular	5, 7	irregular	6, 7	regular	2
Eighth Note	irregular	3 (2)	irregular	2 (3)	irregular	3 (2)	regular	2

instrumental	verse + inst.	inst. IMI	inst. cont.	(fermata)	breakdown
—		—	regular 2		regular 27
once 12	as before	once 14	regular 14		irregular 12, 15
irregular 5, 7		irregular (6) 4	irregular 5 (4)	—	irregular 6 (9)
irregular 2 (3)		irregular (3) 2	irregular 2 (3)		irregular 3 (2)

breakdown cont.	bridge 2	instrumental	heavy vox.	outro
irregular 36, 32	regular 28	once 31	28, 25	regular 2
irregular 16 (4)	irregular 12, 16	irregular 22, 9	14 (11)	regular 2
irregular 6 (4)		irregular 9 (4)	8 (6, 3)	structure regular 2
irregular	3 (2)			regular 2

Table 7.1: Metric hierarchy and regularity by formal section in Tool’s “Schism” (2001).

as underpinning their creative process. In addition to the large cardinality split irregularities, “Schism” exemplifies Tool’s affinity for tresillo relatives and contains a variety of cyclic patterns; isolated metric irregularities (IMIs), including a metric pivot; and an extended section at the boundary of inconsistent irregularity. By discussing the combination of so many irregular metric ideas within a single song, we can simultaneously review the central concepts of earlier chapters, consider their use in analysis, and perhaps gain some insight into a difficult period in Tool’s history.

Table 7.1 reveals both the diversity of metric structures in “Schism” and the recurrence of two foundational grooves. This table introduces two new features, allowing for easy visual representation of temporally complex ideas: the first is my marking of two fermatas in the “formal section” row; the second is the wavy line separating the first and second systems of the table, which denotes a metric pivot. The overall form shown in the table follows many conventions of popular songwriting, progressing through familiar formal sections—intro, repeated verse-“chorus” alternation (see below), bridge, verse-“chorus” return, instrumental, breakdown, second bridge, final verse variant, and outro. Apart from the presence of a second bridge, no part of this form would be unusual in even the most commercial popular music; however, the expansion or extension of many sections in “Schism” abandons convention, yielding a nearly-seven-minute-long song.

The musical score for the intro of Tool's "Schism" shows two staves. The top staff is for Bass, and the bottom staff is for guitar. The score begins with a tempo of $\text{♩} = 98$. The bass part consists of eighth-note patterns. The guitar part starts with eighth-note pairs, followed by a fermata on the fourth beat, and then continues with eighth-note pairs. Dynamic markings include "guitar doubles 8va" and "guitar plays (and holds) A-D dyad". The score then transitions to a section where the guitar plays a sustained note over a bass line, with a dynamic marking "guitar swell on D5". The time signature changes frequently between 4/4, 5/8, and 3/4. Measure numbers 1 through 6 are indicated above the staves.

Example 7.1: Double tresillo and split irregular structures in the intro of Tool's "Schism" (2001).

The instrumental intro can be seen as a microcosm of the full song, presenting two distinct metric ideas: a double tresillo followed by a split irregularity (5,7) with a characteristic riff (see Ex. 7.1).⁵ Split irregular patterns occupy most of the first half of "Schism," where they aptly reinforce themes of clashing personalities, creative differences, and separation. Larger tresillo relatives and other irregular Platonic-trochaic structures underpin much of the second half, beginning with the greatly expanded breakdown section. Because the tresillo family is a core feature of Tool's metric idiolect, it is possible to read the presence of such structures in this song as depicting the band's default, un-marked practice, establishing a reference against which other, more irregular metric patterns, can be measured. A hermeneutic reading of the tresillo-related structures in "Schism" might instead posit these passages as moments of self-reference, signifying Tool's identity as a band and implying ideas like compromise, friendship, and solidarity in the face of external conflicts. As I proceed through my analysis, I highlight the relevance of the potential narrative dichotomy between split structures and tresillo relatives.

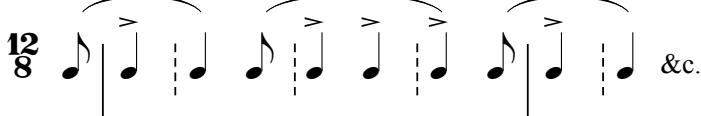
The importance of split irregular patterns in "Schism" is established early as the (5,7) riff from the introduction gains drumbeat support ((2,3)(2,2,3) = (K,S)(K,K,S)) and is retained throughout the first verse. In the drumbeat, both quintuple and septuple meters suggest duple division of the

⁵ Many analyses fail to acknowledge the presence of the double tresillo, positing regular quarter notes at a slower tempo (quarter = 72) either in 5/4 time (necessitating substantial rubato) or in 4/4 with a fermata on the fourth beat. Examples of the former include Perlmutter (2001) and Andy Aledort's (2001) transcription for Hal Leonard (which can be viewed at <https://www.guitar.ch/tabs-pdf/tabs.php?pdf=Tool/Schism>, accessed March 28, 2018); Rick Beato takes the latter view in his *YouTube* video analysis (2018, "What Makes This Song Great? Ep.15 TOOL," https://youtu.be/ScRG40_7zb0, accessed March 28, 2018). There are many reasons to reject such interpretations in favour of the double tresillo view, including the timing of slides between dyads on the recording (which support the three-part division of each dyad, whether dotted or compound), the resulting absence of rubato or a fermata until the end of the passage, and the band's predilection for tresillo successions.

$\text{♩} = 215$

Voice 

I know the pie - ces fit 'cause I watched them fall a - way -

Clap 3: 

Basic form: 

Example 7.2: Isomorphism between a vocal rhythm in the verse of Tool's "Schism" (2001) and the bell part of the basic pattern (bottom; reproduction of Jones 1959, 213).

measure, shrinking and stretching a potential 6/8 model, respectively (this can be seen in **Ex. 7.3**).⁶ There is a general consensus among commentators that the verse riff evinces an irregular (5,7) pattern; however, the twelve-beat context affords other, metrically regular interpretations. We could imagine a hearing in a consistent simple meter, with a full cycle occupying a measure of 6/4 (as in Perlmutter's 2001 transcription), or in a compound meter (12/8). In the latter case, we can observe that the rhythm of the verse vocals is isomorphic with the familiar bell part of the pan-African "basic pattern" (e.g., Jones 1959, 212; see **Ex. 7.2**).⁷ "Schism" relies on the drum kit to establish a metrically irregular context for a rhythmic idea that, while syncopated, could be metrically regular. The placement of the first snare articulation (on the third eighth note of the cycle) disabuses us of entertaining a 12/8 hearing, while the second snare (eighth-note ten) problematizes the 6/4 meter.⁸ Remarkably, once the (5,7) split structure has been established, Tool can introduce cross-rhythms based on rejected regular subdivisional possibilities without annulling the irregular groove. **Example 7.3**, from the second phrase of verse one, shows a vocal rhythm with a compound duple structure

⁶ Were the septuple-meter drum part repeated to form a self-contained cycle, it would be best understood as a half-time groove (or deferred-continuation type within a triple model), which would be unique within the corpus (cf. **Table 4.4**).

⁷ Jones's transcription on page 213 supplies barring that matches my subdivision of the "Schism" riff. Subsequent authors have preferred the term "standard pattern" to "basic pattern"; Jones uses the phrases "basic pattern," "basic form," and "Signature-tune" interchangeably. On the use of this pattern as a "rhythmic archetype" common to many African and afro-diasporic musical traditions, see Burns (2010).

⁸ Conservative listeners may nevertheless entrain to this metric possibility, interpreting every second snare as the culmination of a syncopation occupying beats three through six. I feel that this interpretation is both less generically appropriate than the (5,7) option and that it fails to respond to an important connection between the verse and post-verse sections (see below).

lead part doubled 8va throughout

Voice $\frac{5}{8}$

Bass $\frac{5}{8}$

Drums $\frac{5}{8}$

Pure in - ten - tion jux - ta - posed will set two lo - vers' souls in mo - tion

snares off

Example 7.3: Rhythmic dissonance between a (regular) dotted cross-rhythm and split irregular meter in the first verse of Tool’s “Schism” (2001).

juxtaposed against the continuing (5,7) instrumental accompaniment. The audio clip continues beyond the transcribed passage, showing how the vocals alternate between articulation of the dissonant cross-rhythm and alignment with the metric cues of the riff.

The verse riff is followed by a second split structure (6,7) that is closely related to the first (refer back to **Ex. 5.6**). This second, post-verse riff is transposed down a fourth, and expands the first half of the split metric structure—(2,3) is replaced by (3,3).⁹ The change in metric structure has a significant effect on the negotiation of ideas of regularity, irregularity, balance, and symmetry. At the level of the cycle, both structures are regular; regarding the half cycle, both evince near-equal split structures. When we consider the beat- or quasi-beat-level, however, a striking distinction emerges (see **Fig. 7.1**). Whereas the verse riff proceeds through a range of subdivisional durations, from shortest (2) to longest (4) and back again, always passing through a three-pulse unit, the post-verse riff is nearly consistent in its compound subdivision throughout. Ironically, this near-consistency may result in a more irregular listening experience than the ever-changing verse riff. Note in the figure that, where the shifting subdivisions of the first riff are graphed as a smooth wave, those of the second result in a more disjunct progression. These visual representations of the two metric structures resonate with my aural experience when entraining to the two grooves. Despite its asymmetry, the verse has a certain balance that is absent from the irregular post-verse. Nevertheless, the disjunction of the post-verse riff is indispensable to our evolving experience of the metric fabric of “Schism”: the absence of a plausible metrical interpretation in the post-verse, coupled

⁹ See Chapter 5 for discussion of the drum part.

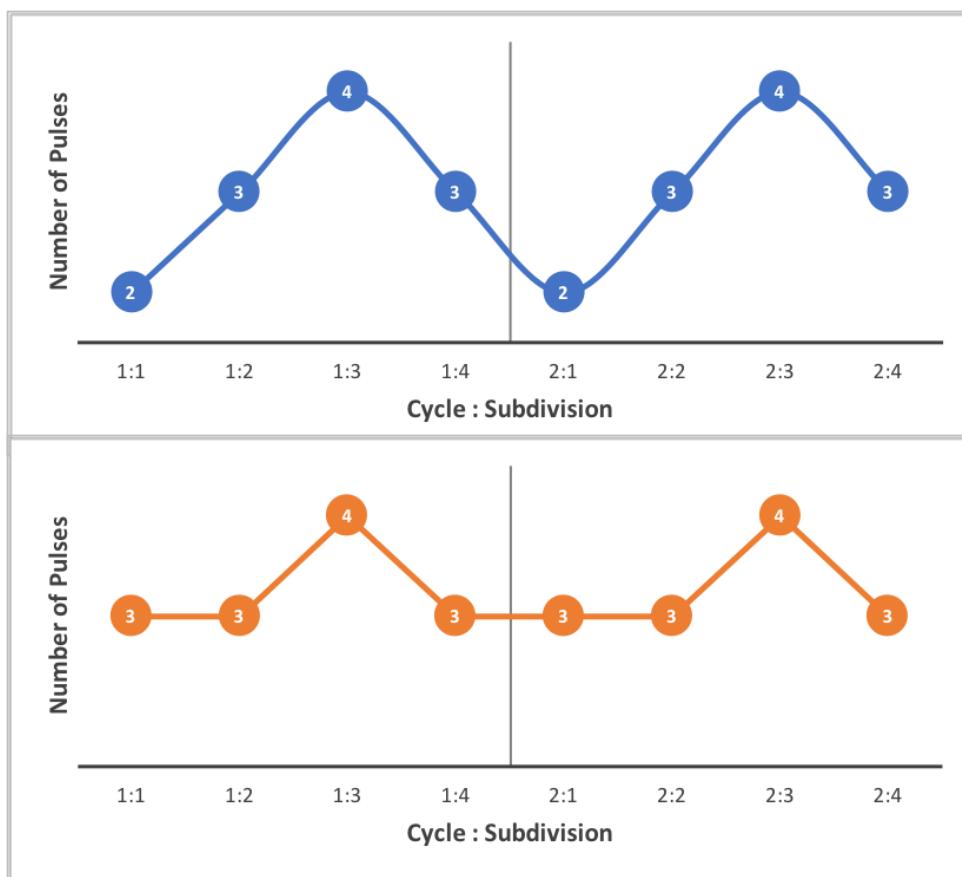


Figure 7.1: Changing pulse content of each subdivision in the verse riff (above, blue) and post-verse riff (below, orange) in Tool’s “Schism” (2001).

with the strong similarities between the two sections, reinforces our split interpretation of the verse riff.

The connection of verse and post-verse is central to understanding the form of “Schism.” Although the post-verse riff is untexted, the passage strongly suggests chorus function. The idea of an instrumental chorus is supported not only through the formal location of each post-verse riff, immediately succeeding the song’s first three verses, but also through the sonic production of the passage, which employs a broader frequency spectrum for the post-verse sections than for the verses. The significance of a chorus without words in “Schism” is implied by the vocals that close each verse. The first verse ends with the phrase “crippling our communication,” an idea that reverberates both literally and metaphorically into the lyrical (i.e., communicative) void of the post-verse. Subsequent verses close with the same final word, “communication,” hinting at refrain function. While the lyrics become more hopeful in verse two (“rediscover communication”) and pragmatic in verse three (“doomed to crumble unless we grow and strengthen our communication”),

$\text{♪} = 215$

The post-verse never supplies the lyrics that might resolve the schism. Tool's handling of these potential chorus sections inverts Jocelyn Neal's (2007, 46) "Time-Shift paradigm," which arises through "a reinterpretation of the chorus's text and meaning in each iteration." In "Schism," the last line of each verse suggests that reinterpretation (i.e., change) might be possible, but any such possibility is denied by the persistent absence of chorus lyrics. The post-verses thus play out a more conventional chorus function by retaining a consistent meaning—the absence, breakdown, or impossibility of communication. At the level of formal section, the dichotomies between the verse (twelve-pulse, potentially regular, texted, and hopeful of change) and the post-verse (thirteen-pulse, unavoidably irregular, instrumental, and denoting stagnation) echo the theme of opposition, established at the metric level through the two split irregular structures.

Following two alternations of verse and post-verse, the first bridge introduces a riff with numerous subdivisional possibilities (see Ex. 7.4). Like the verses, this bridge is based on a cycle with a cardinality of twelve, which supports a regular, simple-meter interpretation.¹⁰ This option is recommended by the first three quarter notes, which articulate the expected Kick – Snare – Kick; however, while the kick supports the simple-meter continuation throughout, the snare deviates from its expected placement in the second half of each cycle. On the one hand, regularity is reinforced by the similarity of the second and third half-note spans, both of which employ the same D4+1 snare

¹⁰ This is the interpretation implied by my brief discussion of this passage in relation to Table 3.6, where I suggested that the drumbeat can be heard as a variant of the normative 3/2 groove, based on the backbeat.

Example 7.4: Subdivisional ambiguity in the first bridge of Tool's "Schism" (2001).

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[Audio Only]

Example 7.5: Drum fill IMI initiating the septuple-meter extension of a tredecuple post-verse in Tool's "Schism" (2001).

displacement (K,K)(_,S). On the other hand, metric ambiguity is always possible when the snare abandons the backbeat. For example, in his *YouTube* video analysis, Rick Beato hears the section according to a (5,7) split like that established in the verse—presumably the subdivision would differ, responding to the dotted cross-rhythm beginning on beat two (2,3)(3,2,2) or (2,3)(3,3,1).¹¹ I have annotated this interpretation above the drums, as it is most clearly visible in the hi-hat articulations. A third, more extreme possibility, might take the drums as the sole metric cue, emphasizing my snare-as-continuation view and revealing symmetrical subdivision pairs of varying spans (2,2)(3,3)(1,1) (annotated below the drums). This would certainly be an unorthodox hearing, and I prefer to consider this succession a rhythmic dissonance within a higher-level, metrically regular groove. The multiple metric interpretations of the bridge befit the lyrics, which describe the potential creative boon that arises from difficulties in communication:

The poetry that comes from the squaring off between
And the circling is worth it, finding beauty in the dissonance

The bridge closes with the first IMI of the song, effected through a metric pivot (refer back to **Table 6.4** and **Ex. 6.11**). This pivot links the bridge to a third instance of the verse/post-verse pair, which is itself extended through the song's second IMI—a drum fill that expands the thirteen-pulse cycle to fourteen with tom work clarifying a pure simple subdivision through the second half of the cycle (see **Ex. 7.5**)—and a new metric pattern that retains the fourteen-eighth cycle (transcribed in septuple meter as **Ex. 4.18**). The established opposition between verse (frustrated but potentially hopeful) and post-verse (nihilistic) continues to inform our reading of these new metric patterns, which, taken together, suggest the beginnings of a narrative trajectory. The metric pivot from bridge back to verse coincides with the phrase "finding beauty in the dissonance," implying a complex stance on the issue—the narrator accepts the discomfort between parties and is galvanized to action (his eagerness can be read in the eighth-note deletion of the pivot). The metric change in the subsequent instrumental suggests a corresponding change in the character of the post-verse, from nihilistic to something more complex, perhaps undecided (**Ex. 4.18** highlights a confluence of conflicting cross-rhythms). Thus, by the mid-point of "Schism," at least two themes have been

¹¹ Discussion of the bridge begins at 8:15.

[Audio Only]

Example 7.6: Breakdown cycle with cardinality of twenty-seven in Tool's "Schism" (2001).

established: (1) communication (or its absence), and (2) attempts at reunion through creative collaboration.

The song's second half introduces a number of new metric structures, most of which either belong to the tresillo family or follow a related Platonic-trochaic structure. The first new formal section is the longest of "Schism"—a breakdown based on an odd-cardinality instrumental vamp that lasts over a minute (**Ex. 7.6** provides an incipit). The absence of both the vocals and drums from this passage creates a calmer, reflective atmosphere, perturbed only by the presence of a new metric irregularity. The cycle has a cardinality of twenty-seven eighth-notes (6,6)(6,9), which can be parsed as a nine-beat compound meter (4,5).¹² This rather long Platonic-trochaic succession, with a run of twenty-one and comma of six, recalls Tool's affinity for larger tresillo relatives (cf. **Table 3.2**). Although the breakdown cycle is not a strict tresillo, the Platonic-trochaic structure bears a metric connection to the double tresillo of the introduction. Subsequent metric changes maintain this "tresillo connection" through much of the second half of "Schism."

Following a lyrical entry over the continuing twenty-seven pulse cycle, the drums are reintroduced within an instrumental build-up, based on a predominantly double-tresillo cycle ((6,6,4)(6,6,4,4))((6,6,4)(6,6,4))—i.e., four repetitions of a double tresillo expanded by a four-pulse interpolation at the mid-point (see **Ex. 7.7**). The use of a motive from the verse riff for the interpolated group is suggestive from the narrative perspective: if the persistence of tresillo and Platonic-trochaic structures through the breakdown is understood as a self-reference, I view the interpolation as denoting the toll that the conflict took on the band. The following section (labeled "bridge 2" in **Table 7.1**) bears the repeated lyrics "between supposed lovers," reinforcing the interpretation of conflict. Bridge 2 is accompanied by yet another metric shift from double tresillo to a related Platonic-trochaic cycle (6,6)(6,6,4). The dotted rhythm is established by four undifferentiated crashes and continued in the vocal part. The resulting twenty-eight-pulse succession is strikingly similar to that of the earlier twenty-seven-pulse breakdown pattern. As we saw above in comparing the twelve-pulse verse and the thirteen-pulse post-verse, the addition of a single eighth-note can have a significant impact on an irregular cycle. The same observation rings true here.

¹² The nine-pulse constituent of the 27-pulse pattern complicates the second reading somewhat as it is subdivided as (3,2,2,2); this might be seen as a local grouping dissonance from the compound-meter perspective.

Build-up

pas - sion

with quarter-note delay

Interpolation

p *cresc.*

Bridge 2

Be - tween sup - po - sed

Example 7.7: Various Platonic-trochaic successions in the build-up and second bridge of Tool's "Schism" (2001).

Where the breakdown ultimately gave the impression of compound meter, bridge 2 affords entrainment to a consistent simple subdivision beneath the cross-rhythm of an extended dotted run. The underlying simple-meter structure is realized in the second half of the cycle by an inverted backbeat (Snare – Kick – Snare – Kick).

My comparison of the breakdown and bridge 2 reveals a dichotomy between two non-adjacent sections for the first time in this analysis. This non-adjacent relationship can be seen to mark the loosening of a sequence of strict binary oppositions which, up to this point, have always related adjacent sections: the tresillo and split structures of the intro, the (5,7) and (6,7) cycles of verse and

The musical score consists of three staves. The top staff is for the Electric guitar, the middle for the Drums, and the bottom for the Bass. The tempo is marked as $\text{♩} = 226$. The Electric guitar starts with a 6/8 measure, followed by a 5/4 measure where the first two measures are grouped together. The Drums start with a 6/8 measure, followed by a 4/4 measure where the first two measures are grouped together. The Bass starts with a 6/8 measure, followed by a 4/4 measure where the first two measures are grouped together. There are several downward arrows indicating metric shifts or new downbeats. A note in the Drums staff is labeled "snare struck with both sticks at once". A note in the Bass staff is labeled "(bell)". Measure numbers 184 and 188 are indicated above the staves.

Example 7.8: Frequent metric changes and displacement of downbeats in the final instrumental of Tool's "Schism" (2001).

post-verse (both internally and in relation to one another), the shift from thirteen to fourteen in the instrumental that ends the first half, and even the (emergent) division of the entire song into two halves. In turn, the loosening of this relationship precipitates a rapid disintegration of metric logic in the following section—a highly irregular instrumental that evokes both the pain of conflict and the resulting creative wellspring (“finding beauty in the dissonance”).

As we have often seen, a high frequency of metric change can trouble our ability to entrain and, in the absence of unambiguous cues, leads to situations that afford numerous structural interpretations. The instrumental passage shown in **Example 7.8** illustrates this phenomenon once again. Because of the ambiguous nature of the passage, I parsed the metric structure differently in the transcribed example $((6,6)(6,4)(6,6))((4,4,6)(4,4,6)(4,4,6)(4,4))$, where I foreground metric regularity as much as possible, as compared to the earlier form diagram $((9,9,4)(9))((8,6)(8,6)(8,6)(8,3))$, which responds instead to those articulations that receive the most

sonic and harmonic emphasis.¹³ The conflict between metric regularity (supported most clearly by the inverted backbeat through the 4/4 measures in the example) and phenomenal salience (marked by the guitars' emphatic D5 arrivals) is shown in the transcription as a displacement dissonance in relation to the hypermetric downbeat: D18-3 in the first instance and D14-3 thereafter. Part of the difficulty in choosing one interpretation over the other is the gradual emergence of the dissonance. In the previous section (bridge 2; cf. **Ex. 7.7**), the early power-chord arrival is easily heard as subordinate to the vocal entry on the subsequent downbeat. The position of the first arrival within the instrumental is not clarified by a vocal entry, but the chord is in a higher octave than following instances, making it less phenomenally intrusive. The first lower-octave arrival is especially salient as it follows a highly disorienting 5/4 measure (the only succession of this length in the section). Upon this arrival, the listener will be more prone to accepting any plausible downbeat, even if earlier measures have established a similar musical idea as metrically displaced.

The structural ambiguity at the metric level complicates higher-level analysis of the passage, which makes it unclear whether the instrumental is best explained through multiple cyclical meter changes and IMIs or as inconsistent. Let us first consider the more straightforward model, given by the meter changes marked in the transcribed example. In a conservative hearing, where the power-chord arrivals are heard as displacement dissonances throughout, the overall structure is (12,10,12)(14,14,14,8). Two halves are clearly distinguished from one another, the first with a mid-phrase IMI (the 5/4 measure), the other with a phrase-ending IMI (resulting from the truncation of the guitar riff's fourth repetition). A more intuitive reading of the first half emerges one level higher, where we find a twenty-two-pulse phrase (12,10) and its incomplete (interrupted) repetition. Despite the undeniable metric instability, none of these patterns are properly inconsistent. In the radical hearing, where each power-chord arrival denotes a new downbeat, the first half is more challenging.¹⁴ The interpretation given in **Table 7.1** is (9,9,4)(9), isolating the bridge-2 riff as beginning each of the two phrases and retaining the nine-pulse metric idea as far as possible through the first. Beyond their subdivisional structure (3,3,3), however, the first two units bear little similarity to one another. A better characterization of the music's surface might be (9,6,7)(9), where the seven-

¹³ Evincing further ambiguity at a more local level, the repeated (8,6) structures in this latter interpretation are based on a (3,2,3)(3,3) succession, which could just as easily be heard as (3,2)(3,3,3) or (5,9). The former analysis has the advantage of being more nearly symmetrical, while the latter results in a less jarring IMI at the end of the section—(5,6) rather than (8,3).

¹⁴ The second half remains relatively straightforward—a repeated riff ending in an IMI (14,14,14,11).

$\text{♩} = 113$
doubled 8va by guitar

Bass

Drums

bass and guitar continue

213

215

Example 7.9: Pairing of tresillo and backbeat elements in the virtuosic instrumental outro of Tool's "Schism" (2001).

pulse phrase contains both E^b5 slides in the guitar and the drum fill is split according to a shift from toms to snare. In either case, the resulting structure follows an (A,B,C)(A) pattern and is best described as inconsistent. Whether or not we call it an inconsistently irregular passage, the instrumental is highly erratic, challenging both listener entrainment and straightforward analytical description.

Within the narrative arc of the second half of "Schism," the progression from stable (if irregular) Platonic-trochaic cycle, through progressively less stable successions, culminating with the (near-) inconsistent instrumental suggests the gradual disintegration of communication and trust within the band as their struggles with external factors become more trying. This frustration is given voice lyrically and instrumentally in the final two formal sections. The first is a variant of the verse riff with aggressive tom work, accompanying the repeated lyric "I know the pieces fit." The second comprises the clearest 4/4 meter in the song, setting a drumbeat that alternates between regular and double-time snare accents against a tresillo riff in guitar and bass (see **Ex. 7.9**). If the continued presence of a tresillo rhythm retains its meaning as a hermeneutic self-referent, the use of the simplest member of the tresillo family in this context might suggest that the band ultimately perceives themselves as somewhat impotent in the face of their label's oppressive directives and the demands of the music market (denoted by the 4/4 meter). However, the abrupt end to "Schism"

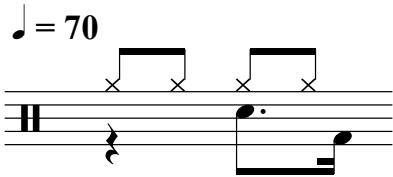
abstains from resolving either of the two parallel metric ideas into the other. The struggle continues, as does Tool's commitment to their creative enterprise.

Radiohead's "Decks Dark": Metric Idiolect After the Corpus

As we have seen, the music of each of the core artists has its own distinctive metric elements. Radiohead's first eight studio albums (those considered in the corpus) tell us a great deal about how the band employs irregular meter in their compositions. For example, the band generally prefers cardinal and sectional irregularities to IMIs and inconsistent structures, the IMIs that they do write almost always concern the super-metric level and are seldom marked by drum fills (even though they are exclusive to phrase-ends), and odd-cardinality super-metric cycles of five or larger correlate strongly with verse sections. While "Decks Dark" (from Radiohead's most recent studio album, *A Moon Shaped Pool* 2016) echoes some of these trends, it also traverses new metric terrain. The present analysis highlights both the characteristic and innovative aspects of the song, reinforcing the band's familiar practices while demonstrating how they continue to surprise and delight.

Taken together, the songs of *A Moon Shaped Pool* are more metrically irregular than those of either of Radiohead's two previous albums (2007 and 2011). Most of the irregularities reflect observations made about Radiohead's metric idiolect within the corpus: "Desert Island Disk," in septuple meter (with an underdetermined intro), and "Ful Stop," in triple super-meter, follow the band's fondness for cardinal irregularities; "The Numbers" is predominantly in 4/4 with two 2/4 IMIs. Two songs, however, explore metric ideas that are uncommon or nonexistent in Radiohead's earlier output. The first is "Daydreaming," which centers on metric ambiguities between three plausible meters related by measure-retaining metric modulations—4/4 with triplets, 12/8, and a slower 6/8. This sort of metric play is far more typical of Tool than of Radiohead; the recordings of the latter group contain only one comparable sustained ambiguity. "How to Disappear Completely" (*Kid A*, 2000) is based on the same grouping dissonance as "Daydreaming" and has a similar tempo, but the addition of drums partway through the former track resolves its ambiguity in favour of a 6/8 meter.¹⁵ "Daydreaming" thus presents a modest novelty within Radiohead's output, balancing the familiar (grouping dissonance) and unfamiliar (refusal to resolve).

¹⁵ Osborn (2017, 71–77) identifies several other grouping dissonances in Radiohead's music, none of which substantially destabilize the meter at hand.



Example 7.10: Consistent drumbeat pattern in Radiohead’s “Decks Dark” (2016).

Formal Section	introduction		verse 1		inst. (w/ choir)	bridge	verse 2
Hypermeasure	once	5	irregular	(10) 9 (8)	regular	2	irregular
Measure	irregular	2 (1)	irregular	5, 4	regular	2	irregular
Half Note	regular	2	irregular	(3) 2	regular	2	irregular
drop-out		instrumental	outro				
once	2	regular	2				
		regular	2				
		regular	2				

Table 7.2: Metric hierarchy and regularity by formal section in Radiohead’s “Decks Dark” (2016).

Like “Daydreaming,” “Decks Dark” strikes a balance between familiar and unfamiliar. The familiar metric element is a relatively simple drumbeat based on a repeating two-beat pattern (see **Ex. 7.10**). Apart from the occasional fill and a single short drop-out, this pattern continues throughout the song. The unfamiliar element concerns the placement of IMIs, which are both more prevalent in certain sections and occur earlier within phrases than is typical of Radiohead. A form diagram of “Decks Dark” shows that IMIs at the super-metric level are localized to the song’s two verses (see **Table 7.2**).¹⁶ The instrumental passages that follow the verses are hypermetrically regular, as are the ensuing texted passages (first bridge, later outro). Except in the outro, every fourth measure of these regular sections is marked by a drum fill, emphasizing a distinction between metrically irregular verses and other (hyper)meterically regular sections. This regularity can be heard in the sound clip of **Example 7.10**, from the first instrumental. Other than the verses, the only remaining section is the intro, which, while establishing the song’s characteristic drumbeat, is underdetermined at the super-metric and hypermetric levels (my parsing in **Table 7.2** is one of

¹⁶ While I have identified these sections as verses, this formal label is debatable. Because their lyrical content is the same (apart from the deletion of two lines in the later section), it could be argued that they instead constitute the song’s choruses. However, the inversion of verse and chorus would be atypical of Radiohead’s practice, and the sonic characteristics of a chorus (broad frequency spectrum, multi-tracked vocals, etc.) are absent from these sections. At least on a first hearing, a listener will almost surely assume verse function, an interpretation bolstered by the initial quintuple super-meter patterning of the two sections (recall Radiohead’s tendency to use such metric structures in verses).

[Audio Only]

Example 7.11: Unique super-metric irregularity in the first verse of Radiohead’s “Decks Dark” (2016).

many possibilities). The verse is thus the first structurally unambiguous passage the listener encounters, drawing attention to the metric novelty of the section.

At most hierarchical levels, the first verse maintains the pure duple structure that characterizes the majority of “Decks Dark” (see **Ex. 7.11**). The half-note cycle of the drumbeat precludes any irregularity below that level, as well as the sort of grouping dissonance seen in “All I Need” (cf. **Ex. 6.8**); at higher levels measures are grouped in pairs, forming eight short phrases.¹⁷ Only at the measure level do we find irregularity, with some measures comprising two half notes and others comprising three. Even this source of irregularity is mitigated by consistencies in hypermetric patterning: 3/2 measures never occupy the second position within a two-measure pair (i.e., five-half-note groups always follow a (3,2) structure); and whenever four- and five-half-note groups are combined, the order is (4,5)—thus, necessarily (2,2)(3,2) one level lower. Because the verse never deviates from these conventions, the deep structure of (10,9)(9,8) is sufficient to describe every level of metric hierarchy in the section. Ironically, the ease with which we can understand the patterning of a given level based on knowledge of an adjacent level has a confounding effect on analysis. At the hypermetric level, the verse appears to be inconsistent, but the metric level suggests a predominantly duple fabric with occasional 3/2 IMIs. I find myself entraining to the two-measure level ((5,5)(4,5))((4,5)(4,4)), largely because of the early placement of the IMIs both locally (within measure pairs) and within the verse as a whole. In other words, the irregularity of the initial (3,2) pattern discourages entrainment, but its repetition results in a regular (5,5) metric idea, establishing an expectation for the rest of the section. When the potential quintuple super-meter begins to erode, the intervening quadruple units take on the function of IMIs; but this reading must itself be revised when the final lines of the verse settle into a consistently duple structure. Ultimately, the metric level, with its early IMIs, gives the clearest metric explanation of the section, while the hypermetric interpretation (of one potential regularity eroding as another takes its place) resonates strongly with Radiohead’s metric idiolect.

¹⁷ These phrases do not necessarily imply a pure-duple grouping, but it is an intuitive possibility towards which many rock listeners will gravitate.

$\text{♩} = 70$

38
Voice Drums

46

49

52

Example 7.12: Drum fills in the second verse of Radiohead’s “Decks Dark” (2016).

The second verse of “Decks Dark” differs from the first in several small ways (see **Ex. 7.12**). Instead of eight lines, which allowed duple structure at higher levels, the second verse has six (omitting what were lines six and seven). The later verse also has a more robust drum tone (the change can be heard in the earlier examples at the boundary between verse one and instrumental) and introduces fills where in the first verse there were none. Structurally, the deleted lines only affect the highest levels. The hypermetric $(10,9)(8)$ retains all lower-level characteristics of verse one: at the super-metric level, we observe the same (ultimately inconsistent) transferal from quintuple to quadruple; at the metric level, 3/2 IMIs are clustered towards the beginning of the section, within a predominantly 4/4 context. The addition of drum fills contributes to the differentiation of verses from the rest of the song. Unlike in the instrumentals and the bridge, the positioning of fills in the second verse (shown as asterisks in this shorthand) $((5,5*)(4*,5))((4*,2*,2*))$ does not support

consistent four-measure hypermeter. Rather, the fills highlight the encroachment of quadruple super-meter on the would-be regular quintuple pattern. The first fills are subtle, not interrupting the continuing hi-hat pulse, but as the verse progresses they become progressively more intense, marking the final (4/4) measures most clearly. The result is a controlled build in intensity, precipitating the most highly marked passage in the song—two measures without drums that separate verse two from the final instrumental vamp and texted outro.

The metric structures of the verses of “Decks Dark” are intriguing in their own right, as is the careful handling of drum fills throughout the song. More telling for our purposes, however, is how these features extend Radiohead’s earlier practice in small but discernible ways. The band takes advantage of their fans’ expectations—in this case, an established (if subliminal) connection of verse sections and odd-cardinality super-meter. In “Decks Dark,” the minimum span of music required to suggest such patterning (two quintuple cycles) prompts entrainment in conversant listeners, making the subsequent destabilization of this cycle through the invasion of a conventional 4/4 pattern all the more dramatic. Within both verses, Radiohead inverts the expected relationship of regular 4/4 and irregular quintuple patterns. The potency of this inversion rests on two layers of stylistic competence: ingrained conventions learned from decades of rock listening, and knowledge of a specific metric idiolect associated with Radiohead.

Tori Amos’s “Icicle”: Metric Irregularity without Drums

Throughout this dissertation I argue that the drums are an essential source of information for analysts seeking to understand metrically irregular rock music. Yet not all rock songs have a drum part, and metrically irregular songs without drums present unique complications—many of which fall outside the purview of this project. I make an exception here for two reasons. First, the recordings of Tori Amos feature many songs without drums, distinguishing her output from all other sources for this project. It thus seemed fitting to address this idiosyncrasy through analysis. Second, by examining a song that *could* include drums but that does not, I draw attention to moments when a subtle percussive cue might clarify a metrically ambiguous passage.

“Icicle” is the ninth track on Amos’s sophomore release, *Under the Pink* (1994). Its lyrics respond to themes established in “God,” the most successful single from the same album. Where “God” offers an uncomfortable juxtaposition of Christianity and misogyny, “Icicle” depicts a girl masturbating in her room while her family holds Easter Mass. While the drums’ absence is

Formal Section	introduction					(fermata)
Hypermeasure	(underdet.)	irregular	4, 3	regular	(7, 8) 6	
Measure	once 3	irregular	2 (1)			
Half Note	regular		2	irregular	3 (4, 5)	
Quarter Note	regular			2		
Eighth Note	regular			2		

(Formal Section)	vamp	verse 1			verse 2	bridge	
(Hypermeasure)	regular	2	irregular	19, 24, 27, 33, 30	irregular	9, 17	regular 2 (1)
(Measure)	regular	2	irregular	(19) 12 (15, 21, 18)	irregular	(5) 4 (7, 6)	regular 2
*Dotted Quarter	regular	2	irregular	(9, 10) 6	irregular	(3) 2	regular 2
(Eighth Note)	regular	3	irregular	3 (2)	regular	3	regular 3

bridge cont.	vamp	verse 3					
irregular 27, 26, 25, 24	once 2	once	(9, 7) 8				
irregular 13 (14, 12)	regular 2	irregular	(5) 4 (7)				
irregular 6 (7, 8)	regular 2	irregular	(3) 2				
irregular 3 (2)	regular 3	regular	3				

Table 7.3: Metric hierarchy and regularity by formal section in Tori Amos's "Icicle" (1994).

appropriate to the intimacy of the scene, Amos's musical depiction of female sexual pleasure foregoes other more common tropes. Specifically, whereas female sexual pleasure is often associated with cyclical rhythms, progressions, and forms (distinguishing it from the telos of male sexual pleasure), the metric changes of "Icicle" suggest a different experience, one replete with halting irregularities.¹⁸ "Icicle" is one of the most metrically irregular songs from Amos's early recordings; it contains several IMIs and inconsistencies that, without a drum part to clarify beat or grouping, can suggest various metric interpretations. The piano accompaniment is percussive enough to clarify most of the song's changing meters, but moments of ambiguity remain that reward careful contemplation. My analysis identifies a long-range metric connection, and considers an especially ambiguous passage, illustrating the song's most delicate metric details.

The form of "Icicle" is relatively straightforward (see **Table 7.3**). A two-part instrumental intro leads to an AABA texted body, in which A sections constitute verses (the first and third prepared by a vamp) and B is a two-part bridge. The intro is metrically underdetermined at first, with long pauses

¹⁸ Fink (2005, 37; drawing on McClary 1991, among others) eloquently summarizes the view that disco and minimalism exemplify "a pleasure that is goalless and avoids the phallus; a pleasure that is the domain of subjectivities—non-Western, gay, female—defined in opposition to the norms of Western patriarchal culture; a pleasure that offers a respite from the pressures of the Ego; a pleasure that is 'pure' desiring-production without Oedipal struggle."

of inconsistent durations. The first established meter is 4/4, but this soon gives way to a potentially inconsistent span in which triple measures are most common. In the form diagram I represent this shift from two-level quadruple meter (2,2) to single-level triple (indivisible) with a brace. A second metric shift separates the introduction from the first vamp section in 6/8; because this metric modulation coincides with a major section boundary, marked by a fermata, the form diagram includes a system break and a modified hierarchy legend. The rest of the song is in the new compound meter with only occasional disruptions to the dotted quarter note. As with many of Amos's slower compound-meter grooves, some listeners will prefer to count the body of "Icicle" in 6/4 (or 3/4) time (for example, the tempo of the 6/8 part of "Icicle" is about the same as that of "Spark"; cf. **Ex. 1.2**). Irregularity in the verses usually consists of phrase-initiating IMIs, stretching the established 6/8 with a measure of 9/8. The first part of the bridge is metrically regular with an ongoing displacement dissonance, while the second part recalls the intro—potentially inconsistent at first, though 6/8 is present intermittently and is eventually reconfirmed.

The structures of the second part of the intro and the second part of the bridge are strikingly similar (see **Ex. 7.13**). Although the base meters are different (3/4 in the intro, 6/8 in the bridge), both begin with the same four-measure sequence: a single measure in the base meter, a measure with an added beat (4/4 and 7/8, respectively), one more in the base meter, and one with two added beats (5/4 and 4/4).¹⁹ Similarly, the second phrase of the intro is paralleled in the bridge, though the bridge phrase comes four measures later than the corresponding measures in the intro (see "2nd Phrase" in the example). Both passages feature three measures in the base meter followed by one with an added beat (3,3)(3,4) and (6,6)(6,7). The intervening phrase in the bridge follows a similar pattern (hence, "2nd Phrase Var."), adding a beat to the first measure as well (7,6)(6,7). Finally, both settle into the base meter until the end of the formal section (marked as "3rd Phrase"). The similarity in the overarching metric shapes of these two passages results in a corresponding similarity of affect, in which initial anxiety or hesitancy abates into steady, purposeful repetition. This shape is common to other phrases in the song, though these two passages, verging on inconsistent irregularity (or evincing it unequivocally in their initial phrases, if these are considered separately), offer the most

¹⁹ The apparent 5/4 measure contains a held note, affording the possibility of hearing a 4/4 measure with a fermata. I prefer the 5/4 interpretation, not only because it encourages the structural affinity I have drawn between intro and bridge, but also because the rest of the passage is performed in a fairly strict time. Unfortunately, comparison of the recorded passage to live performances of "Icicle" is unhelpful in resolving this ambiguity because Amos omits the album intro in her live sets (sometimes instead extending the pre-verse-one vamp).

Intro

Piano

1st Phrase (3,4)(3,5)

2nd Phrase (3,3)(3,4)

3rd Phrase (3,3)(3,3)

Bridge

Voice

1st Phrase (6,7)(6,8)

2nd Phrase Var. (7,6)(6,7)

2nd Phrase (6,6)(6,7)

3rd Phrase (6,6)(6,6)

The musical score consists of several sections:
 - **Intro:** A piano part in 3/4 time at tempo 95, featuring a repeating pattern of eighth-note chords. The section is divided into four measures labeled A, B, A, C.
 - **1st Phrase (3,4)(3,5):** Continues the piano part with a similar pattern.
 - **2nd Phrase (3,3)(3,4):** Continues the piano part with a similar pattern.
 - **3rd Phrase (3,3)(3,3):** Continues the piano part with a similar pattern.
 - **Bridge:** A vocal part in 6/8 time at tempo 133. It includes lyrics: "Get-ting off get-ting off while they are_ all down - stairs sing-ing prayers sing-a-way". The vocal part is divided into measures labeled C_b, G_b, A_bm, F_b, and a section labeled "progression looped".
 - **1st Phrase (6,7)(6,8):** A vocal part in 6/8 time. It includes lyrics: "he's in my pump-kin P. J.s_ lay your book_ on my chest feel the word feel the word". The vocal part is divided into measures labeled A, B, and A.
 - **2nd Phrase Var. (7,6)(6,7):** A vocal part in 6/8 time. It includes lyrics: "feel the word feel the word feel the woord and feel it_ I_ could have I_ should have". The vocal part is divided into measures labeled C, B, and A.
 - **2nd Phrase (6,6)(6,7):** A vocal part in 6/8 time. It includes lyrics: "— feel the word feel the word feel the woord and feel it_ I_ could have I_ should have I_ did-n't". The vocal part is divided into measures labeled A, B, and A.
 - **3rd Phrase (6,6)(6,6):** A vocal part in 6/8 time. It includes lyrics: "I_ could have flown you know well I_ could have I_ should have I_ did-n't". The vocal part is divided into measures labeled A, B, and A.

Example 7.13: Two initially inconsistent passages resolving into cyclical grooves in Tori Amos's "Icicle" (1994).

intense instances. Moreover, the phrases in question share a dramatic arc, beginning softly before broadening in dynamic range and, in the bridge, in the pitch space occupied by the vocal melody. The second parts of both the intro and bridge are among the most intense passages of “Icicle,” aided substantially by Amos’s deft manipulation of the metric fabric, balancing elements of irregularity and regularity to great effect.

More perplexing from a metric standpoint is the irregularity at the start of the first verse. The ambiguity of this moment allows us to speculate as to how a hypothetical drum part might clarify the situation. Before considering the details, however, a brief review of the rest of verse 1 provides important context. All but the first phrase of the verse is transcribed in **Example 7.14**, showing a consistent compound meter throughout and the presence of compound triple (9/8) IMIs at the beginning of new lines of text (the IMIs cease during the refrain, “gonna lay down”). The slow, compound nature of the meter is somewhat equivocal; a double-time compound duple is also possible, though it becomes difficult to reconcile this hearing with later events. I retain the slower tempo throughout this analysis; for listeners sensitive to the ambiguity, it persists through much of the song. That said, the meter of “Icicle” is notably stable through the passage transcribed. Neither tempo option is substantially destabilized by the occasional held notes in the piano’s sixteenth-note accompaniment (see especially the second and third measures of the example). That each line begins with an IMI is clarified by the harmonic rhythm—both measures of 9/8 are based on variants of the earlier vamp figure, expanding the measure by repeating the initial open fifths (cf. the final measures of the example, where the vamp figure returns). Later verses follow the same model of compound duple meter with phrase-initiating compound triple IMIs. Only at the beginning of the first verse is the model varied.

Metric ambiguity in the first phrase of the first verse of “Icicle” is substantial, especially on a first listening having entrained to the compound duple meter of the preceding vamp (see **Ex. 7.15**). The subtle lengthening of the third notated downbeat of the verse (marked as a fermata in my transcription) leads to further metric destabilization when the vocal melody suggests a potential four-eighth-note cross rhythm. One possible interpretation might eschew my fermata, instead hearing that note as the first four-eighth-note span. In either case, the second half of the phrase is metrically unclear. This ambiguity is exacerbated by the fact that the piano, which maintains the established compound meter, is quite soft in these measures. Some listeners may not regain a sense of metric clarity until the verse’s second phrase (**Ex. 7.14**). Metric ambiguity in the first phrase is also

42 ♩ = 133

Voice I - ci - cle i - ci - cle where are you go-ing____ I have a hi - ding place when

Piano { l.h.

45

spring mar - ches in will you keep watch for me I hear them cal-ling

48

gon-na lay_____ down gon-na

51

lay_____ down

Example 7.14: First-verse phrases with unambiguous compound meter in Tori Amos's "Icicle" (1994).

3+ ♩ 4 ♩ 4 ♩

42 ♩ = 133

Voice I - ci - cle i - ci - cle where are you go-ing____ where are you go - ing

Piano { l.h.

9 ♩ 9 ♩

Example 7.15: Sources of metric ambiguity in the first phrase of the first verse of Tori Amos's "Icicle" (1994).

present at the hypermetric level. The return of the initial accompaniment pattern (from the pre-verse vamp) in the fourth measure of my transcription suggests that the phrase begins with a three-measure group. Subsequent listenings may lead to a different interpretation of these measures: following the context outlined earlier, some listeners will come to expect the line to begin with a measure of compound triple meter—an expectation supported in the first phrase by the piano part (see the annotations below the staff). Even in this interpretation, however, the passage is distinct from subsequent phrases, for it necessitates two measures of 9/8 to align the return of the piano figure with a downbeat (rather than the isolated measures encountered elsewhere). The two-measure 9/8 hearing offers a more normative, duple hypermeter at the expense of consistency at the metric level. Put differently, this is the only phrase of the verse that can be heard in 6/8 time throughout, and some listeners will continue to prefer this interpretation despite cues for 9/8 in the piano. In sum, these initial measures of the first verse form the most metrically ambiguous passage in all of “Icicle” through the confluence of a potential fermata, several subtle grouping dissonances, and the absence of a clear resemblance to later phrase construction. The absence of a drum part further encourages ambiguity of metric interpretation. To demonstrate the clarifying power of the drums, I conclude this analysis by considering several hypothetical drumbeats for the phrase.

Example 7.16 presents four plausible drumbeats for the first phrase of the first verse. Each of these has accompanying audio, created in Pro Tools by combining the passage from “Icicle” with drum samples taken from other Tori Amos recordings.²⁰ Drumbeats A and B draw attention to hypermetric design, each employing a normative pattern of kick and snare articulations that favour the 6/8 or the 9/8 hearing. Drumbeats C and D supply a hi-hat pulse at the eighth-note level: the former includes a slight *ritardando* through the beat marked elsewhere by a fermata, while the latter resolves the complication with an added eighth note, setting in motion the four-eighth-note cross-rhythm in the vocals.²¹ Both of these drumbeats follow the initial 9/8 option, but can easily support

²⁰ The stick click sample comes from “She’s Your Cocaine” on *From the Choirgirl Hotel* (1998), while the kick drum and hi-hat sounds are both from songs on *The Beekeeper* (2005)—“General Joy” and “Cars and Guitars,” respectively. While the samples are all original to Amos’s catalogue, I cannot claim to have captured her style. On the contrary, Chamberlain’s drumming is typically far more complex than what I present here. These examples should not be understood to suggest what Amos might have chosen as an appropriate drumbeat for the passage (she chose to produce the song without drums); rather, by eliminating metric ambiguity from the phrase, they demonstrate its importance.

²¹ Live performances of “Icicle” suggest a preference for considerable rubato over the occasional eighth-note expansion, even though the latter approach is not uncommon elsewhere in Amos’s repertoire. See, e.g., <https://youtu.be/53uqoLpnugA> and <https://youtu.be/DwIaQ8FnqM>, both accessed April 23, 2018. Nevertheless, I find recording C to be the least musical possibility; I believe this is because, had the song been recorded with drums, Amos would not have indulged in rubato to the same extent.

A

Voice $\text{♩} = 133$

I - ci - cle i - ci - cle where are you go - ing
where are you go - ing
stick click

Drums

B

Voice $\text{♩} = 133$

I - ci - cle i - ci - cle where are you go - ing
where are you go - ing

Drums $\frac{9}{8}$ $\frac{6}{8}$

C

Voice $\text{♩} = 133$ poco rit. tempo

I - ci - cle i - ci - cle where are you go - ing
where are you go - ing

Drums $\frac{9}{8}$ $\frac{6}{8}$

D

Voice $\text{♩} = 133$

I - ci - cle i - ci - cle where are you go - ing
where are you go - ing

Drums $\frac{9}{8}$ $\frac{10}{8}$ $\frac{6}{8}$

Example 7.16: Hypothetical drumbeats for the first phrase of the first verse of Tori Amos's "Icicle" (1994).

further possibilities based on the 6/8 version. We could also model the aforementioned double-time compound-duple groove with a quicker alternation of kick and snare, a pace which would surely recommend the added beat (or its omission) over the fermata/rubato option. More importantly, the variety of hypothetical drumbeats I have transcribed (and the plausibility of others like those just mentioned) attests to the inherent metric flexibility of the passage, a feature that supports the emotive weight of this moment in "Icicle." As members of Amos's audience, we can appreciate the

song's metric flexibility and the absence of drums. Meanwhile, as analysts of popular music, we can find value in the simple but meaningful contrasts between each hypothetical drumbeat and the stark difference between any of them and the original recording, all of which confirms the immense impact that drums have on metric analysis.

Next Steps

The foregoing analyses demonstrate a range of metric ideas rooted in my observations from the corpus and expand on my findings in subtle but significant ways. In Tool's "Schism" we saw the juxtaposition of numerous types of metric irregularity, including a variety of cyclic structures, IMIs, and potentially inconsistent patterning. Radiohead's "Decks Dark" showed how the idiosyncrasies of a given artist's output can recommend an otherwise counterintuitive metric interpretation. Lastly, Amos's "Icicle" concretized the clarifying influence of the drum kit by both illustrating ambiguities that arise in its absence and allowing us to compare several simple drumbeats in a metrically flexible passage. My corpus analysis not only provides an important vocabulary for describing some of the more challenging metric structures encountered in these songs (and others like them); it also informs our expectations concerning drumbeat and subdivisional structure, both broadly within rock music of the past three decades, and more narrowly for each of the three artists in question.

These analyses, and the work undertaken in the corpus, are indicative of several promising avenues for future research. The notion of a metric idiolect, for instance, has repeatedly proven a fruitful site of inquiry, exemplified by recent work by Brackett (2008) on Led Zeppelin and McCandless (2013) on Meshuggah. My examples note the metric eccentricities of several artists beyond the core three. In particular, the musics of Dream Theater, Soundgarden, Sting, and TTNG show great promise for future work on metric irregularity, as do the catalogues of Ben Folds, Björk, and Moe, though these three are less well represented in the corpus. Moreover, many of these artists occupy the borders between rock and progressive or experimental genres (metal for Dream Theater, jazz and fusion for Sting, and electronica for Björk). These genres all boast their own metric conventions and drumbeat (or drum-machine or sampler) practices, the study of which will surely enrich our understanding of metric irregularity. By becoming more closely acquainted with the metric proclivities of many individual bands and artists, we can study the sub-generic differences that align a given artist, album, recording, or groove with a specific affect or identity. While my

survey of rock irregularity emphasized commonalities across the entire corpus and the idiosyncrasies of specific songs or passages, there is surely a salient middle-ground waiting to be illuminated.

Another important context for metric irregularity, foregrounded briefly in my consideration of a much larger sample of songs in Chapter 2, is the gradual ebb and flow of historical change. I stressed the increasing incidence of metric irregularity through the 1960s and its subsequent decline through the 1980s and 1990s, as observed in the top positions of *Billboard* magazine's "The Hot 100" chart. While the period covered by the corpus is too short to track trends evolving at such a slow pace, all of the metric ideas central to this dissertation could be explored more deeply by investigating long-range historical data. It is easy enough to find songs in rock's history that evince the most common drumbeat strategies observed in my corpus. Three famous metric-level septuple grooves demonstrate a representative range: from the undifferentiated snare articulations of The Beatles's "All You Need is Love," to the alternating quadruple (backbeat) and triple (Kick – Snare – Kick) measures of Pink Floyd's "Money," to the 7:2 cross-rhythm backbeat of Bee Gees's "Jive Talkin." Nevertheless, a larger analytical project might reveal nuanced changes in drumbeat practice from one era to the next.

Most intriguing by far are the countless ambiguities I encountered in my research, many of which I attempted to tease apart in the preceding pages. Ambiguity of tactus is a recurring feature in metric research on many musical traditions—one felt especially acutely in the study of Euro-American popular styles due to the absence of a written score. As several of my examples have shown, the concurrence of an irregular meter with an ambiguous tactus can invite numerous plausible interpretations, reminding us that meter is essentially an imaginative activity and that each of us listens differently. Ambiguity of subdivision is also not uncommon in irregular rock music, particularly in large-cardinality grooves, complex metric transitions, and passages of inconsistent irregularity. Oftentimes such ambiguities can be clarified by attending to each instrumental part individually. While this separation of parts facilitates consideration of the drumbeat, it leaves listener interpretation of the "total musical fact" an open and difficult question.²² Colloquial references among rock musicians to grooves "in 5" or "in 13" (for example) suggest that shared knowledge of an irregular cardinality can be sufficient to coordinate the articulation of certain grooves, regardless

²² A thoughtful approach to this issue was modelled in the "Positional Listening/Positional Analysis" session, with Elizabeth Marvin as respondent, at the 2016 joint meeting of the American Musicological Society and the Society for Music Theory in Vancouver.

of ambiguities of subdivision or of tactus. Nevertheless, scholarly attention to the details navigated by each member of an ensemble can only serve to deepen our sensitivity to these nuanced metrical issues. The persistence of myriad ambiguous metric phenomena, both in and beyond my survey, promises that our engagement with questions of metric irregularity will never exhaust the subject.

Complex examples like those analyzed in the present chapter, and elsewhere in the dissertation, are not outliers within the recordings of their respective composers. Rather, they constitute high-water marks of metric creativity from artists who are continually drawn to novel forms of metric innovation. I hope that my exploration of drumbeat and metric structure in these songs has reinforced the notion that study of metrically irregular phenomena can open our ears to new ways of hearing meters of all sorts, especially—in rock music, at least—through careful attention to the intimations of the drums.

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Appendix I: The Songs of the Corpus

The core artists are listed first, ordered chronologically by earliest full-length studio release (Amos, Radiohead, Tool). The various Billboard, Rolling Stone, and Wikipedia lists follow, in that order. Some songs appear more than once: a single asterisk (*) denotes that a song appears in two different sources; two asterisks (**) denote that a song appears in three sources.

Tori Amos (43 Songs)

Little Earthquakes (1992)

1. Crucify

Under the Pink (1994)

2. God *

8. Cornflake Girl

Boys for Pele (1996)

4. Professional Widow

12. Talula

From the Choirgirl Hotel (1998)

1. Spark

3. Black Dove

10. Hotel

12. Pandora's Aquarium

To Venus and Back (1999)

5. Lust

9. Datura

Strange Little Girls (2001)

10. Happiness is a Warm Gun

Scarlet's Walk (2002)

3. Wednesday

4. Strange

5. Carbon

9. Sweet Sangria

12. I Can't See New York

13. Mrs. Jesus

17. Virginia

The Beekeeper (2005)

4. Jamaica Inn

5. Barons of Suburbia

11. Witness

13. Ireland

14. The Beekeeper

18. Marys of the Sea

American Doll Posse (2007)

2. Big Wheel

10. Secret Spell

16. Roosterspur Bridge

20. Dark Side of the Sun

Tori Amos (continued)

<i>Abnormally Attracted to Sin</i> (2009)	<i>Midwinter Graces</i> (2009)
3. Strong Black Vine	2. Star of Wonder
4. Flavor	8. Jeanette, Isabella
6. Maybe California	
9. Police Me	<i>Unrepentant Geraldines</i> (2014)
10. That Guy	1. America
15. Fast Horse	2. Trouble's Lament
17. Lady in Blue	3. Wild Way
	9. Giant's Rolling Pin
	13. Rose Dover

Radiohead (22 Songs)

<i>Pablo Honey</i> (1993)	<i>Amnesiac</i> (2001)
1. You	5. I Might Be Wrong
7. Ripcord	
8. Vegetable	<i>Hail to the Thief</i> (2003)
	1. 2+2=5 (The Lukewarm)
<i>The Bends</i> (1995)	3. Sail to the Moon (Brush the Cobwebs out of the Sky)
5. Bones	5. Go to Sleep (Little Man Being Erased)
10. Black Star	6. Where I End and You Begin (The Sky is Falling In)
	13. Scatterbrain (As Dead as Leaves)
<i>OK Computer</i> (1997)	
2. Paranoid Android **	<i>In Rainbows</i> (2007)
11. Lucky	1. 15 Step
12. The Tourist	5. All I Need
<i>Kid A</i> (2000)	
1. Everything in its Right Place *	
7. In Limbo	<i>The King of Limbs</i> (2011)
8. Idioteque	1. Bloom
9. Morning Bell	6. Codex

Tool (28 Songs)

<i>Undertow</i> (1993)	<i>Lateralus</i> (2001)
1. Intolerance	1. The Grudge *
2. Prison Sex	3. The Patient
5. Crawl Away	5. Schism **
6. Swamp Song	7. Parabola
7. Undertow	8. Ticks & Leeches *
8. 4°	9. Lateralus
9. Flood	<i>10,000 Days</i> (2006)
<i>AEnima</i> (1996)	1. Vicarious *
1. Stinkfist	2. Jambi
2. Eulogy	4. 10,000 Days (Wings Pt. 2)
5. Forty Six & 2	5. The Pot *
7. Hooker with a Penis	8. Rosetta Stoned *
9. Jimmy	9. Intension
11. Pushit	10. Right in Two
13. AEnema	
15. Third Eye	

From Billboard Magazine's "The Hot 100" (6 Songs)

- Hozier – “Take Me to Church” (2013) **
Meredith Brooks – “Bitch” (1997) *
No Doubt feat. Lady Saw – “Underneath it All” (2001)
OutKast – “Hey Ya!” (2003) *
Taylor Swift – “I Knew You Were Trouble” (2012)
Vertical Horizon – “Everything You Want” (1999) *

From Billboard Magazine's "Alternative Songs" (77 Songs)

- 311 – “Hey You” (2009)
Alanis Morissette – “Ironic” (1995)
Apocalyptica feat. Adam Gontier – “I Don’t Care” (2007)

“Alternative Songs” (continued)

- Awolnation – “I Am” (2015)
- Bastille – “Flaws” (2013)
- Belly – “Feed the Tree” (1993)
- Better than Ezra – “King of New Orleans” (1996)
- Big Data feat. Joywave – “Dangerous” *
- The Black Keys – “Tighten Up” (2010) *
- Blink 182 – “Up All Night” (2011) *
- Bush – “Machinehead” (1995)
- Crash Kings – “Mountain Man” (2009)
- Crash Test Dummies – “Mmm mmm mmm mmm” (1993)
- Dave Matthews Band – “Too Much” (1996)
- Dirty Heads – “My Sweet Summer” (2014)
- Disturbed – “Inside the Fire” (2008)
- Evanescence feat. Paul McCoy – “Bring Me to Life” (2003)
- Fall Out Boy – “Sugar, We’re Goin’ Down” (2005)
- Foo Fighters – “Times Like These” (2002)
- Goo Goo Dolls – “Iris” (1998)
- “Name” (1995)
- “We Are the Normal” (1993)
- Hozier – “Take Me to Church” (2013) **
- Incubus – “Adolescents” (2011) *
- “Pardon Me” (1999)
- Jet – “Cold Hard Bitch” (2003)
- Juliana Hatfield – “Universal Heart-Beat” (1995)
- Lenny Kravitz – “Are You Gonna Go My Way” (1993)
- Linkin Park – “One Step Closer” (2000)
- Lit – “Miserable” (1999)
- Live – “The Dolphin’s Cry” (1999)
- Marcy Playground – “Sex and Candy” (1997)
- Meredith Brooks – “Bitch” (1997) *
- Metallica – “The Day that Never Comes” (2008)

“Alternative Songs” (continued)

- Michael Penn – “Seen the Doctor” (1992)
- Morrissey – “Tomorrow” (1992)
- Mumford and Sons – “I Will Wait” (2012) *
- “Lover of the Light” (2012)
- Oasis – “Wonderwall” (1995)
- Of Monsters and Men – “Crystals” (2015)
- Papa Roach – “Last Resort” (2000)
- Pearl Jam – “The Fixer” (2009) **
- “Who You Are” (1996)
- A Perfect Circle – “The Outsider” (2003)
- Peter Gabriel – “Digging in the Dirt” (1992)
- R.E.M. – “Shiny Happy People” (1991)
- Rise Against – “Audience of One” (2008)
- “Savior” (2008) *
- Sarah McLachlan – “Building a Mystery” (1997)
- Screaming Trees – “Nearly Lost You” (1992)
- Semisonic – “Closing Time” (1998)
- Shinedown – “Sound of Madness” (2009) *
- The Smashing Pumpkins – “Bullet with Butterfly Wings” (1995)
- “Tarantula” (2007)
- Soul Asylum – “Misery” (1995)
- Soundgarden – “Black Hole Sun” (1994)
- “Burden in My Hand” (1996)
- “Pretty Noose” (1996)
- Squeeze – “Satisfied” (1991)
- Staind – “Believe” (2008)
- The Stone Roses – “Love Spreads” (1994)
- Stone Temple Pilots – “Interstate Love Song” (1994) *
- The Struts – “Could Have Been Me” (2014)
- Sublime with Rome – “Panic” (2011) *
- Suzanne Vega – “Blood Makes Noise” (1992)

“Alternative Songs” (continued)

System of a Down – “Toxicity” (2001)
 Tantric – “Breakdown” (2001)
 Toadies – “Possum Kingdom” (1994)
 Tonic – “If You Could Only See” (1996)
 Tool – “The Pot” (2006) *
 —— “Schism” (2001) **
 —— “Vicarious” (2006) *
 Tori Amos – “God” (1993) *
 Twenty One Pilots – “Stressed Out” (2015) *
 Unwritten Law – “Save Me” (2005)
 Vertical Horizon – “Everything You Want” (1999) *
 The White Stripes – “Icky Thump” (2007)

From Billboard Magazine’s “Hot Rock Songs” (34 Songs)

Alter Bridge – “Isolation” (2010)
 American Authors – “Best Day of My Life” (2013)
 Avenged Sevenfold – “Buried Alive” (2010)
 —— “Nightmare” (2010)
 —— “Welcome to the Family” (2010)
 The Black Keys – “Tighten Up” (2010) *
 Big Data feat. Joywave – “Dangerous” (2013) *
 Blink 182 – “Up All Night” (2011) *
 Breaking Benjamin – “Give Me a Sign (Forever and Ever)” (2009)
 Chevelle – “Face to the Floor” (2011)
 Fall Out Boy – “My Songs Know What You Did in the Dark” (2013)
 Hozier – “Take Me to Church” (2013) **
 Incubus – “Adolescents” (2011) *
 James Bay – “Hold Back the River” (2014)
 Matt McAndrew – “Take Me to Church” (2013)
 Mumford and Sons – “Babel” (2012)
 —— “Hopeless Wanderer” (2012)

“Hot Rock Songs” (continued)

- “I Will Wait” (2012) *
- Panic! At the Disco – “Emperor’s New Clothes” (2015)
- “Hallelujah” (2015)
- Pearl Jam – “The Fixer” (2009) **
- Phillip Phillips – “Home” (2012)
- Rise Against – “Savior” (2008) *
- Sawyer Fredericks – “Iris” (2015)
 - “Old Man” (2015)
- Seether – “Country Song” (2011)
- Shinedown – “Sound of Madness” (2009) *
- Stone Temple Pilots – “Interstate Love Song” (1994) *
 - “Plush” (1992)
- Soko – “We Might Be Dead by Tomorrow” (2012)
- Soundgarden – “Live to Rise” (2012)
- Sublime with Rome – “Panic” (2011) *
- Twenty One Pilots – “Stressed Out” (2015) *
- The White Buffalo and the Forest Rangers – “Come Join the Murder” (2014)

From Rolling Stone Magazine’s “500 Best Songs of All Time” (2011) (2 Songs)

- Radiohead – “Paranoid Android” (1997) **
- OutKast – “Hey Ya!” (2003) *

From Wikipedia’s “List of musical works in unusual time signatures” (56 Songs)

- Akeboshi – “Kamisama no shitauchi” (2005)
- Akeboshi – “Wind” (2005)
- Alice in Chains – “Them Bones” (1992)
- Anathallo – “The River” (2008)
- Animal Collective – “What Would I Want? Sky” (2009)
- Ben Folds – “Bastard” (2005)
- Broken Social Scene – “7/4 (Shoreline)” (2005)
- Björk – “Crystaline” (2011)

“Unusual time signatures” (continued)

- “Hollow” (2011)
- Dave Matthews Band – “Seven” (2009)
- Dream Theater – “The Count of Tuscany” (2009)
- “Metropolis—Part 1: ‘The Miracle and the Sleeper’” (1992)
- “A Nightmare to Remember” (2009)
- “Scene Six: Home” (1999)
- EL VY – “Sad Case” (2015)
- Fu Manchu – “Pick-up Summer” (1992)
- Gorillaz – “5/4” (2001)
- Hail the Sun – “Eight Ball, Coroner’s Pocket” (2012)
- “Testostyrannosaurus” (2012)
- Hozier – “From Eden” (2014)
- Iron Maiden – “A Matter of Life and Death” (2006)
- Moe – “Wind it Up” (2007)
- Motion City Soundtrack – “Boxelder” (2012)
- Muse – “Animals” (2012)
- The National – “Demons” (2013)
- Nine Inch Nails – “The Becoming” (1994)
- OSI – “Memory Daydream Lapses” (2003)
- Pearl Jam – “The Fixer” (2009) **
- Primus – “Eleven” (1991)
 - “Here Come the Bastards” (1991)
- Queen – “Innuendo” (1991)
- Radiohead – Everything in its Right Place (2000) *
 - Paranoid Android (1997) **
- Red Hot Chili Peppers – “Ethiopia” (2011)
- Seal – “Dreaming in Metaphors” (1994)
- Slint – “Breadcrumb Trail” (1991)
- Soundgarden – “My Wave” (1994)
 - “Spoonman” (1994)
- Sting – “Big Lie Small World” (1999)

“Unusual time signatures” (continued)

——— “I Hung My Head” (1996)

——— “I Was Brought to My Senses” (1996)

——— “Like a Beautiful Smile” (2003)

——— “Seven Days” (1993)

——— “St. Augustine in Hell” (1993)

Sum 41 – “Nothing on My Back” (2001)

Tool – The Grudge (2001) *

——— Rosetta Stoned (2006) *

——— Schism (2001) **

——— Ticks & Leeches (2001) *

TTNG (formerly This Town Needs Guns) – “26 Is Dancier than 4” (2008)

——— “Baboon” (2008)

——— “Crocodile” (2008)

——— “Gibbon” (2008)

——— “Panda” (2008)

——— “Rabbit” (2008)

Vanessa Hudgens – “Last Night” (2008)