Rhythm and Expectation

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Abstract: This four-part series[1] explores the relationship between rhythm, expectation, and experience. It describes musical terms and central concepts while using specific examples from Morocco to problematize western-centric binaries.

Keywords: musical terms, sound, Africa, global, Middle East

The online version of this chapter includes all embedded content and is available at https://worldmusictextbook.org/witulski-rhythm.

This set of short essays describes core elements of rhythm by prioritizing perception with three goals in mind. First, I aim to introduce some terminology that can inform how we hear and understand what we listen to. These elements may prove more or less helpful depending on the music that is playing, but they are widely applicable.

Second, the approaches here resist the western-centric methods and perspectives that commonly define things like beat, meter, and subdivision. The examples that I present—especially the ones in the final section, where I draw from my own research in Morocco—show how western perspectives are not as widely useful as they are often assumed to be. Like other global musical systems, western musical notation is derived from specific histories and compositional styles. It is a tool serving a purpose, one that is usually related to the preservation of specific elements of a composition for the sake of performance. Even within the context of western classical music, it hinders certain nuances of performance practice when used inappropriately. For this reason, I define concepts broadly with the hope that they may prove more useful across a range of musics and experiences.

And, speaking of experience, I want to focus our understanding of music and sound more holistically on the body. We do not just hear music, we feel it, dance it, sing it, and hear to the world around us through it. Yet, each of us does so differently based on our own experiences, abilities, training, hopes, dreams, and so on.

These essays are organized into four parts. The first introduces some basic concepts of rhythm through the lens of expectation. The second addresses repetition and meter using cycles, again drawing on expectation. The third moves

[1] This originated online and is split into multiple separate parts. They are combined into a single PDF here for convenience. Some links may break over time, but the online versions will remain updated.

WORLD MUSIC TEXTBOOK, ISSN: 2767-4215;
http://dx.doi.org/XX.XXXX/XXXXXXXX.2021.XXXXXXX

Hamadsha ensemble in a performance in 2013

to the micro-level by discussing beat and timing and how they impact the way we feel music. The final part uses these ideas of rhythm, expectation, and repetition to introduce and analyze three rhythmic patterns from Moroccan sacred musics that resist easy definition according to western perspectives.

Part 1: Expectation and repetition

So much of music is about expectation. People who make music set these up by working within and against what a listener is expecting, which is, in turn, based on shared experience. The result is a series of common practices or loose guidelines that are commonly called "rules." Much of music's excitement, confusion, surprise—the richness that makes it fulfilling in so many ways—derives from how it satisfies or transgresses our expectations.

Familiarity, unfamiliarity, and repetition

While rhythm is an integral part of all music, it is often foregrounded in discussions of drumming or percussion. Depending on your musical experiences and expectations—what you listen to—a drumming pattern can be confusing, boring, groovy, exciting, and so on. Example 1 is a common rock beat. Thanks to the globalizing tendencies of the music industry, this is a familiar sound for many people across the world.

Many different things combine to determine how you might hear and feel this pattern. Here are some examples:

Familiarity: If you have heard certain types of popular music before, then this pattern may sound familiar. That does not mean that you have words to describe it or have ever listened and said "Oh, I know that drum pattern, I've heard it before!" This is an example of how things like globalization, memory, nostalgia, and culture play out in listening. If someone remembers her parents listening to a certain artist or type of music (like 1950s country, the band Blood, Sweat, and Tears, or 1980s hip hop, for example), then similar little moments

Link for Part 1 (Examples 1-6 and Video Example 1). Scan the QR code or visit the website to view.

in something that is new to her can bring back old emotions or memories. For country, a guitar picking technique might trigger a memory. Brass instruments like the trumpet and trombone in a rock band might take her back to Blood, Sweat, and Tears. "Old school" beat samples may draw out '80s hip hop. It is nearly impossible to talk about music without these memories and experiences. The hard part, of course, is that we all live different lives. Therefore, when we hear something new (or old), we hear it differently. Even if it's a supposedly "simple" rock beat.

Unfamiliarity: If you have no expectations—maybe because something you hear, see, or taste is brand new to you—it's really hard to guess what is coming next. But we only have to wait a moment to find out. With visual art that is static (like a painting), we might take our time and look more closely at details. We return to what we saw and think about it differently. Music vanishes into the air as soon as we hear it. We are left with memories of the sound and of how our bodies reacted to it. Maybe we danced and felt the movement. Perhaps we are at a loud live concert where we were pushed around by the sound waves. I still remember the sensation of how the heavy drums at a Lenny Kravitz concert physically shoved my guts to the back of my ribcage when I was in high school.

Repetition: If the sound repeats, then it is easier to find a pattern and build an expectation. Of course, it also sets us up as listeners to be surprised when the repetition ends. And some patterns show themselves to us more quickly: that, again, is based on what we have heard before.

In the case of the example above, the pattern is broadly (but not universally) familiar. It's also repetitive over a short *cycle*, a single iteration. Cycles can be measured in different ways. A composer scoring a film might be thinking in terms of seconds or milliseconds to line up the sound and the video. It is more common, though, to refer to an internal pulse called a *beat*. That word gets used in many other ways, though, and we'll leave it for now and come back to it later.

Organizing time

That earlier pattern is fairly simple (which doesn't mean that it's not interesting or full of potential creativity). More intricate patterns with less regular internal relationships can make it harder to grasp what's happening at first. More significantly, however, is the fact that there is no single way to hear or feel rhythm, let alone music. Example 2 is an example from a family of common rhythmic cycles that are common in African diasporic traditions, especially in Brazil, Cuba, and the United States. It usually gets played on an instrument that is loud and clear, since musicians use the pattern to hold everything else together. A bell of some sort or the *clave*, a pair of sticks, are common instruments to use. This particular variation is sometimes called the *rumba clave* after the Cuban rumba (see Moore 2010).

Go back and listen to that again, but try and clap along this time. Just see if you can work it out. It might be hard, it might be easy. Where does the cycle start? Can you hear the point where it repeats?

Really, listen again and try clapping or tapping along. Then try to stomp or say "Top" at the beginning of each cycle.

Example 3 is an example of this pattern in practice, though it is it hidden somewhat within the guitar accompaniment. See if you can hear it: Lydia Mendoza, "La Bamba".

You might have heard the pattern differently, though. If we move the starting point to another part of the pattern, it changes the character (Example 4).

Wayne Marshall describes how this pattern is tied to the racialized history of country music, calling it the "American clavé" (Marshall 2020). Flipping it so that the new beginning of the cycle is at the beginning of the graphic makes it easier to see (Example 5).

Note that the clap to start the pattern happens during a silence. Rhythm is not just about sound, it's about the creative use of space, too. On the website accompanying the article, Marshall shares a long "megamix" of songs from across American music history that utilize the same rhythmic cycle (Video Example 1). Listen for how the pattern organizes time through repetition and expectation across these songs. It might quickly become familiar. (It's a long mix, jump around to hear different examples.)

Ambiguous terms

It's worth discussing the words *rhythm* and *beat* themselves before trying to use them to talk about other things. People use these words interchangeably and, in fact, they can mean the same thing. They also might refer to different, but related, ideas. I separate them here while recognizing that the language used to talk about these distinctions "in real life" is at least somewhat artificial.

A *rhythm* refers to sounds and silences that are associated based on their relationship in time. They come together to create a unified "thing" that might appear again. Some traditions have well-recognized names for certain rhythms. When rhythms that are familiar appear in different contexts, they might gain

referential meanings over time. "Shave and a haircut, two bits" has become a common ending to songs during over the last century in America. It was so common that it could be and satirized. This short video has some good examples and discusses how such a short phrase can build so much anticipation.

The *dembow* rhythm (Example 6) comes from a specific place and has its own history in the Caribbean (Marshall 2008). Like the examples above, it demonstrates how repeating a *rhythm* can turn it into a *groove*, to use a not-so-technical term. This pattern underlines global popular music styles, especially in genres like *reggaeton*.[2] "Don Don," a 2020 release from Daddy Yankee, Anuel AA, and Kendo Kaponi, is one of many examples.

One use of the phrase *the beat* refers to the cycles of looping rhythmic phrases that gives forward momentum to a piece of music. As the next part describes, the *beat* of a song can also refer to a steady pulse that we sense in our bodies. The confluence of the pulse and the music that marks that pulse creates a terminological ambiguity that can be confusing when writing about sound.

Familiarity, expectation, and ambiguity are more than esoteric musical ideas. Musicians use them in meaningful ways. Take an example from electronic music (among other things): the beat drop.

When "the beat drops" in a song, the entire groove of the music dramatically and powerfully changes. That the change happens at a specific moment (*a beat*) and is caused by changes to the repetition of rhythms (*the beat*) is not lost on dancers in a club who are anticipating the drop, ready for the boost of energy. Anticipation, which is related to expectation, builds as the musician (a DJ in this case) toys with the sound of the music. The pacing of the music doesn't change, but something in *the beat* does. It's easier to hear this than to read about it. It's even better to feel it happen, since rhythm and music are things that our body reacts to. Let yourself *feel* these sounds as much as you hear them or see people reacting: Skrillex in Argentina.

Part 2: Cycles of time

We can divide time into pieces, both small and large. Seconds or minutes move quickly when compared to hours, days, and weeks. We can count seconds, but feel hours passing differently. We generally use sleep to mark days and weather can tell us about passing months or years. The same is true for music. While writing music down on paper forces us to measure things in certain ways, those methods are not always aligned with how we sense sound's temporal momentum.

Most musics around the world, including many European and American styles, use rhythmic cycles to orient the listener. The rock beat from earlier shows this: within much popular music, the cyclic repetitions provide momentum and stability while the subtle variations (like those in the dance club)

[2] When preparing this, I did a quick search in Spotify for "reggaeton" and found a mix of songs from 2020. Almost every one of them had the dembow rhythm featured prominently in the mix.

manipulate that stability to create anticipation. This is one reason why popular music can be criticized as "mechanical" (see Adorno 1990[1941], for an example), but it's also one of the reasons why it is accessible and engaging.[3]

These cycles even have names: a high school jazz band percussionist may get sheet music with a small label in the upper left hand corner that says "samba," "funk," "rock," or "bossa nova." These terms refer to adaptable patterns that the player can learn. They play this cyclic pattern ("lay down the beat," perhaps) and provide a foundation for the rest of the ensemble. The player is not a machine, though. She will incorporate nuances and changes to match other things that are happening across the ensemble or to toy with the energy level of the performance. The pattern is simply a skeletal guide, a starting place.[4]

In many Middle Eastern musical styles, these patterns have similar names, each with its own history, appropriate place, and connotation. Johnny Farraj and Sami Abu Shumays describe many of them in *Inside Arab Music*, but they also outline a selection on their website: maqamworld.com. These patterns, collectively called *iqa'at*, are made of up two general types of drum strokes (or other sounds): *dum* signifies a lower, heavier sound while *tek* is usually higher or lighter. Maqamworld.com uses the letters *D* and *T* to show these, with *S* signifying a pause or silence. Take a moment to listen to the ways in which some of these cycles work in different pieces: the iqa' called *maqsum* is a popular one to start with. The examples for *ayyoub* show a huge diversity of stylistic range within one pattern. Some, like *zaffa* are specifically linked to certain traditions, in this case a wedding procession, even though they now appear in other styles and contexts. Listening to a symphony orchestra presenting popular music, as when a group like Black Violin incorporates hip hop beats into classical chamber music contexts, gives an idea of how a rhythmic pattern (a funky hip hop

[3]Western classical music, as it is often taught in schools, focuses on grouping smaller divisions of time to create *measures*, also called *bars*. The divisions are called *beats*, not to be confused with *the beat* (of, say, a pop tune).

[4]This way of thinking about how to organize time in music differs from how rhythm and a concept called *meter* are taught in many music classrooms. Where the approach I describe here follows the way people make, listen to, and feel music in many contexts across the world (including in Europe and the United States and in classical music traditions), the teaching of rhythm and meter often focuses on quasi-mathematical procedures that relate to written musical notation. In practice, both in western educational systems and elsewhere, rhythm is taught verbally, using syllables. One example that demonstrates how an unwritten educational system can represent complex rhythms uses syllables like "takadimi" to connect and divide rhythms within Hindustani music's *tala* system. For more on this particular practice, see chapter 4 of George Rucker's *Music in North India* (2011). Notation is important for a number of reasons, but there is much that it does not represent well, including nuances in rhythm that change the "feel" of a pattern. Furthermore, centering a specific type of notation and transcription can inadvertently reinforce problematic ideologies (see Marian-Blaa 2005). As seen in the maqamworld.com examples that follow, musicians across the world use western notational techniques as a tool to represent sound, but they recognize its failures and it rarely shows up as a performance tool. This, again, is true in "the west": innumerable outstanding musicians never needed to learn to read music to wield it powerfully. Notation is an abstraction that can serve a purpose (namely, it can preserve and transmit some elements of sound for distribution, analysis, or similar goals). Also relevant is the fact that there are many other representational systems available to musicians and listeners, not only the one that has roots in European classical traditions (see Killick 2020 for one example).

beat) can hold its identity in a seemingly unrelated context (the classical music hall).

Layers of interaction

Cyclic rhythmic patterns can grow and adapt in many ways. One is through improvisation: a musician can subtly change the placement of certain sounds, add new ones, or remove a few parts of the rhythm to regulate energy. "Regulate" sounds so sterile, it's about getting a crowd hype or making them hold their collective breath in anticipation. Groups of people can work together to do the same. If you have ever clapped along to a piece or changed how you move your feet while dancing, you were co-creating a pattern. This happens when, at a concert, everyone starts jumping together or swaying from side to side, cell phone flashlights held high. Rhythm can draw people in and unite them in a common musical experience.

Another form of adaptation is layering. A technical term for a repeating rhythmic pattern is an *ostinato*. When one of these ostinatos (rhythmic cycles) appears alongside another, they can combine to create something identifiably new. This is how a drum set works. A pattern on a bass drum appears alongside a second one on a snare drum, perhaps a third on a high hat cymbal, and others on floor toms, larger cymbals, or other instruments to create an intricate groove.

A simple example from my own research in Morocco demonstrates this well (Witulski 2019). This is a pattern that appears in much popular music, but I crossed paths with it when researching a sacred ritual tradition as practiced by the *issawa* brotherhood.[5] It is part of a religious healing ceremony that involves prayer, possession trance, devotional singing, and plenty of dancing for fun. This rhythm animates the moments where the musical ensemble invites laughter and popular religious songs into the long night's event. It also appears in a tradition of sung poetry called *malhun* that includes both "sacred" texts and "secular" ones (Magidow 2016).

In *issawa* contexts, musicians articulate this pattern on a pair of clay drums that are tied together. Some artists have switched from these traditional drums, however, to use manufactured *timbales*. In both cases, a larger and smaller drum makes two distinct sounds: one is lower and the other is higher. In *malhun*, different musicians each have small handheld goblet-shaped drums. Each one, called a *tarija* has a slightly different sound because of the natural fish-skin head. This video shows another brotherhood, the *hamadsha*, who borrow from both of these styles within their own ceremony. I recorded this in Meknes in 2013. The group is led by Abderrahim Amrani and features a guest, Mohammad Essousi, who is a prominent *malhun* singer (Video Example 2).

In Example 7, drums and clapping articulate two main rhythmic patterns. The first is two notes, equally spaced. The second is offset and the notes are

[5] In this case, the term "brotherhood" refers to the all male musical ensembles who carry out ritual ceremonies. The events themselves are usually open to client families (who require healing through sacred blessing) and their friends.

Link for Part 2 (Examples 7-8 and Video Example 2). Scan the QR code or visit the website to view.

unequally spaced. They are layered to build a new pattern, one that is coincidentally similar to reggaeton's *dembow*.

Combining the two patterns changes the overall rhythmic cycle's feel. They integrate into a single idea, yet people still clap along to one pattern or the other, as in the video. Try identifying and clapping the distinct patterns when listening to the two of them together, then mute each (in Example 8) and try to clap the other. It may be easier to go back to the video and clap along with the musicians.

These are mechanical examples produced by a computer. The real participants in the video changed the patterns in other ways, as well. For one, it is common to speed up when approaching the climactic ending of a section of poetry. As they accelerate, musicians subtly adjust the relationships between the two patterns. They might make the last note of the second pattern louder to push listeners back to the beginning of the cycle. When I am at a ceremony or concert, I can feel this rushed anticipation in my body. They might squeeze the two middle notes, which are already close together, even tighter to excite the music further. We turn toward these details next.

Part 3: Feeling the beat(s)

Just as musical repetitions and relationships can orient listeners over long stretches of time, smaller details impact how we feel music in the moment. Some of these details go unnoticed in common discussions of sound. For example, they may not appear in written music notation in western contexts. That doesn't mean that they are not important or that we don't feel them.

Much of the world's music has a sense of *pulse*, a consistent sense of motion. This is one of many terms that is difficult to describe in words without falling back on other equally problematic sets of terminology. It also resists being bounded into a specific definition. Take dance: a pulse can be the points in time where you put your feet down or, in the case of Argentinean tango music, where you step while walking. Listen here and watch as the dancers' feet move

in a somewhat consistent pulse, or, to use another term, to a beat.

That word, *beat*, returns here. The *pulse* is often referred to as the *beat*, but I will nudge the meaning here to say that each pulse—each moment in time—is a *beat*. These beats that make up the pulse are not identical to the rhythm, though in Western music notation systems, they do get used to calculate larger structures like *meter*.

One striking aspect of the *pulse* and *beats* in a piece of music is that listeners can sense them, even if no sound happens at those moments in time. They are not explicitly aligned with strikes on a drum or chords on a guitar. They exist among and between sounds. They are perceived, imagined, and based on our expectations.

Listen to this rhythm. The consistent pulse is explicitly presented between the two instruments (a bass drum and snare drum). Try clapping the consistent *pulse* that is marked in blue boxes along with the rhythm.

In this case, every beat of the pulse (at least as I hear it) is played by one of the instruments. Here's another example that's similar. Try clapping along again. In this case, you can see the consistent pulse highlighted in blue outlines, but you can also *feel* it, even when the bass drum does not specifically articulate it. (Listen without the pulse, then you can use the button to add it in.)

This time, the beat in the middle of the repeating pattern is not articulated, but you may have still felt it and clapped during the space. Your body moves the same way and the clap feels appropriate there. This is the result of *syncopation*, an emphasized sound that does not appear on a regular beat or at an expected moment. In this case, the bass drum hit shows up before the expected beat.

As stated above, this is not just about drums. Here are some lines that could be in a funk band horn section. Even without the rest of a group, you may be able to feel the beat. They both have some syncopation, but the second one has even more. Yet, the pulse is still there (even if it's harder to feel out of context).

Not all music has an underlying pulse. When a musician performs "freely" and without adherence to a consistent pulse, it can be termed *free rhythm*. This happens in solo introductions to a piece of music that showcases a performer's virtuosic and expressive technique. Without an underlying consistent pulse, a musical idea can still toy with related ideas like *pacing* to generate motion and tension. By moving from slow to fast or suddenly shifting the momentum, free rhythm can generate a powerful feeling of rhythmic direction.

0.0.1 Grouping beats

Even when the pulse is fairly consistent, we don't hear music as a steady stream of even sounds. It's possible to intentionally give that sensation of mechanical consistency to listeners, but usually we hear and feel weight in different places as we find patterns by grouping beats together. These groupings comprise the concept of *meter*, though that term can be tied into music notation in ways that are not always helpful. Like so much else here, these are easier to hear or feel than they are to describe.

Most groupings are either sets that are multiples of two (*duple*) or three (*triple*). They can be combined to make innumerable other possibilities. They can also both happen at once. Most popular music is duple: rhythmic patterns like the ones described above overlay a pulse of evenly grouped beats. That does not mean that we all hear the same duple groupings: I might hear groups of 4 quick beats where you hear 2 slow ones. Unless you are trying to write music down, that distinction is unimportant. Here is a loop with a clave sound that divides the pulse in two different ways, but they are both duple.

Each group is called a *measure* or *bar* and where those measures start and end can be arbitrary. In the above example, someone could feal each iteration as one bar or made up of two shorter ones.

Triple groupings *feel* different. Here is an example from the American old time fiddling tradition as performed by Tommy Jarrell, an influential fiddle player. Try counting "one, two, three, one, two, three…" as he plays. A lifting or lilting sensation is at the core of many triple meter pieces, in part because of the dance steps that the music accompanies.

If the pace quickens, though, we might feel the central pulse somewhere else. In this short sample of an Irish jig, a patting sound marks the beat. Counting "one, two, three" quickly still fits well, but a dancer cannot move her feet at that speed. Instead, you step to a slower "one, two."

"The Short Grass Jig" by Wendy MacIsaac, Jackie Dunn MacIsaac

We can also add sets of duple or triple groupings to make more complicated ones. Arabic music has a classical form called *samai* that is technically ten beats. In practice, however, it is a group of three beats followed by a group of four (or two pairs), and then another group of three.

These groupings can appear in ways that foster ambiguity and generate tension for the listener. Rhythms can spread over time in a way that emphasizes two or more different pulses simultaneously. This displacement can be troubling or exciting. Stephen Friedson argues that it opens the body to an experience of trance (1996). Ann Danielsen describes how the guitar groove in James Brown's famous song "Sex Machine" creates its own pulse that is slightly offset from the main one followed by the rest of the band (2006). While it does not bring about trance, it gives life to funk. In either case, a similar musical practice impacts the listener in a contextually-defined way, but both change our perception (Becker 2004).

Listen to this example and clap along to the pulse that you hear. Then try clapping to a different one by clicking the button. If you are up to the challenge, try shifting your perception from one to the other and back. At first, it might feel unnatural. Eventually, and with familiarity, it may get easier.

0.1 Dividing time

Just as beats are organized into larger groups (measures), they are divided into smaller parts. Of all of the rhythmic concepts discussed here, this might be the one where notational practices in western tradition struggles the most to depict the sounds that we hear. Sounds that land between beats rarely come

at mathematically consistent intervals. Instead, a musician's expressivity will push a note just before or after, making it subtly early or late.

The consistent division of beats that creates an expectation for listeners is called the *subdivision*. The nudges that happen in practice usually go unspoken, but some analysts and music theorists call it *microtiming*. Subdivisions are somewhat straightforward to talk about. Microtiming involves a level of nuance that can be far more difficult to articulate.

In western music theory practice, subdivision is generally taught as *duple* or *triple*, just like meter and measures (the larger grouping of beats). A duple subdivision divides each beat into two even halves or some other multiple of two (like four quarters). A triple subdivision divides them into three. Like the pulse itself, these divisions are not always made explicit in the music: they are structures we perceive as listeners.

The following examples present these structures as connected levels of organization. When listening, you can use the buttons to have the loop articulate different "scopes" (the measure/grouping of beats, the pulse/beats, and the subdivision/division of beats).

Note that since these are real audio examples, they don't line up perfectly. The performers subtly shift their timing, even over a short period. The first example, which demonstrates a duple feel, is a version of "St. Louis Blues" by Jim Reese Europe's "Hellfire Band." Europe was a popular and successful black bandleader in the early 20th century who led a military band during World War I.

This second example, with beats grouped into sets of three and divided into duple subdivisions, is from American fiddle music.

0.1.1 Playing with subdivisions

In practice, musicians manipulate these divisions further. *Swing* is one common example that developed as part of the early jazz scene in the United States before the word came to represent its own genre of music. In swing, a duple subdivision turns into something else: the musicians lengthen the first half and shorten the second half. This means that they are no longer halves.

Musicians make use of the flexibility that live performance offers.[6] Swing performers themselves vary the degree of their swing to create an individual style. Even within a single musical line, they change the ratios of their subdivisions to build and release tension (Benadon 2006). Christine Gerischer shares similar ideas about Brazilian samba music, showing that this is not unique to the genre known as "swing" (2006). These manipulations are examples of *microtiming*, adjusting the timing of notes in slight, but noticeable, ways.

These adjustments can sound and feel different. As a basic demonstration, move the slider to change the subdivision ratio and listen to how the simple swing drum set beat responds. Then, see if you can hear or feel the swing in

[6] It should be said that flexibility in subdivisions and other expressive techniques are not exclusive to human performers. Electronic music has this capability and, in some cases, can do so with more specific intentionality on the part of the composer or producer.

Count Basie's "One O'Clock Jump." (It's not always easy to hear, but you may feel like there's some forward momentum that you can't quite articulate. That's fine! In fact, that's the point!)

A frequent division of the beat that is related to swing involves a first "half" that is roughly two-thirds of the length of the beat, leaving one-third for the second "half." This particular division turns into a mathematical *triple* subdivision where the first two thirds are linked together and roughly aligns with another name: a *shuffle*.

This example from Odetta, a folk singer and Civil Rights activist in the 1950s and 1960s, is a slow shuffle, which brings it closer to the sound of the blues.

This technique of rushing or delaying notes can happen anywhere in a piece of music, but it is a matter of balance. Breaking too far from expectations or norms could confuse a listener or dancer, but sticking to them methodically might get dull. One of my own favorite moments that exemplifies this is from a performance of "Watermelon Man" by Mongo Santamaria. While listening, try to let yourself feel the groove and, if the music inspires you, move along with it or clap. Then, *feel* how the percussion (drum set and other instruments) almost pull the horn section (the brass instruments and saxophone) along. It is even more extreme when the percussion drops out at about 30 seconds in. When I listen, I can't help but to actually feel this tension in my body, as well as the relief that comes when they snap back together.

The final section turns to Morocco for a series of rhythms that challenge expectations by combining each of these practices.

Part 3: Feeling the beat(s) Back to contents References

0.2 Part 4: Consistent inconsistencies from Morocco

As mentioned in the opening of this series, one of my main goals here is to disassociate widely used terminology from an exclusive understanding based in western classical music and its associated system of written symbols.[7] Rhythm is central to music worldwide, even in contexts where it is important in absentia like free rhythm improvisations. It is difficult to imagine music that does not incorporate a sense of passing time. Even where that might be possible, it is likely to work by breaking expectations.

The exclusive association of ideas like beat and meter to western systems has a secondary impact: it leads analysts to consider all music from a perspective that adheres to western traditions. Using three examples from my own research in Morocco, I aim to demonstrate how centering experience and per-

[7] The symbols that I refer to here include "standard" notation. These systems and the organizational logics that underpin them can influence many musical activities, including pedagogy/teaching and analysis/transcription. Transcription is the act of notating sounds and, while it often refers to writing out spoken words (transcribing language), it can also involve using some notational system to transfer music into a static and written form. It can be a powerful tool for preserving music, as demonstrated by composers "notating" their musical ideas for the convenience of performers, and musical analysis.

ception and decentering prescriptive conceptions of musical elements brings about new ideas of how music works.[8]

0.3 Uneven beats

Two of these three examples come from the *hamadsha* tradition. The hamadsha brotherhood is a Muslim Sufi group, which means that they regularly gather to perform and participate in sung devotional poetry. Unlike some other Sufi brotherhoods, the hamadsha are organized as professional ensembles who visit client houses to chant and sing poetry along with instrumental accompaniment. They are closely linked to the figure of Aisha, a spirit who possesses some individuals. The ritual healing ceremony is not an exorcism. One of its goals is the maintenance of the relationship between Aisha and her host body. The musicians and their ceremony help the client to appease Aisha through chanting, prayer, singing, a trance possession "dance," and the ritual sacrifice of animals like chickens and goats.[9]

An evening hamadsha event moves through a number of segments, each with its own musical characteristics. One, called the *saf al-ginbri* features an underlying rhythmic pattern of uneven heavy beats. This pattern is also common elsewhere in the world, including the Balkan region of Europe and across the Middle East (Goldberg 2020). This example is from a ceremony I attended with the hamadsha leader Abdderrahim Amrani.

A western system would define this as a 5/8 meter by focusing on the consistent pulse. In practice, however, this is felt at the larger grouping of one short beat (subdivided in half) and one that is slightly longer (made up of three subdivisions). Is it a consistently uneven pulse (which would be consistent in its own way) or is this an example of two smaller groupings combining?

I argue that there is no "correct" way to hear this. The western notational practice of calling something like this 5/8 (five even beats grouped into two and three), however, obfuscates what we hear by prioritizing written convenience. It fits better into a system built for western classical tradition that way.

0.4 Shrinking beats

A second pattern is both more complicated from the perspective of western musical systems and far simpler when understood on its own terms. It comes from another Moroccan ritual healing ceremony that is part of the *gnawa* tradition. This music is widely associated with Morocco's history of slavery and the sub-Saharan Africans who were forcibly brought to the country across the

[8] While my research was ethnographic fieldwork over roughly three years in Morocco, these observations are my own. I hope to take the ideas I present here back to Morocco and make them central to interviews and conversations to see whether they are shared by Moroccans who live these musical traditions. This is methodologically difficult in part because the terminologies used by musicians trained in western systems (wherever they might live and work) do not always align with how listeners talk about music.

[9] For more detail on the hamadsha and their ritual ceremony, see Witulski 2019.

Sahara from West Africa. This ritual also serves to heal clients by repairing the relationship between them and possessing spirits, but here Aisha is just one of many. As with the hamadsha, the ceremony moves through various segments. These are associated with specific colors (black, white, blue, and so on) that identify individual spirits or sets of spirits who might possess the client. The music of each segment is specific to that spirit, but it is more broadly similar throughout the evening than the more varied music that animates the hamadsha ceremony.

Gnawa music uses three types of instruments. A single low bass string instrument called a *hajhuj*, *ginbri*, or *sintir* is at its core. This is the only melodic instrument that accompanies singing. A large drum called a *tbal* appears in certain places. Of interest here, though, are the *quraqib*, sets of iron castanets that beat out consistent rhythmic patterns throughout most of the overnight ceremony.

Most individual songs in gnawa music start slowly and get faster as the trance intensifies.[10] This example—and many similar instances of speeding up gradually that happen across the globe—is different than most western instances where, for example, acceleration may happen at the end of a piece to build excitement. When it does happen in western traditions, the internal subdivision pacing increases with the speed of the beats. This maintains the relationships between them (at least roughly). A duple subdivision usually stays duple.

At higher speeds, it can get hard to maintain the pace of subdivisions simply because shorter notes get too fast to play. This pacing issue is simply accepted and normalized in gnawa music. The pattern that starts a piece gets so fast that the musicians "even out" the distance between the subdivisions. Mathematical ratios are less important than the intensity of the experience. A gradual moves happens where a feeling of a duple subdivision shifts into a triple one as longer notes shorten. This example, whch was played by Abderrahim Abderrazak, my teacher during my fieldwork in Fez, Morocco, shows the progression. Skip around the entire track and listen for the difference between the rhythmic pacing of the beginning and the end.

This example lets you change the pacing yourself. You can see how it goes from feeling like an even duple subdivision to a triple one as you shorten the first note in the pattern. That also quickens the looping repetitions.

Western notation easily represents the duple subdivision of the beginning and triple of the ending, but the gradual change throughout the song means that most of what brings a person into trance cannot be so easily written down. The subdivision relationships here are not a result of a larger conceptual framework. They come from a group of people who are playing as fast and intensely as they can so that their music will invite a spirit into the room and heal a listener. In this way, what we hear reflects a specific set of priorities.

[10] If using western terminology, the speed would be referred to with the term *tempo*.

0.5 Poetic license

The final rhythm I present here animates two different segments of the hamadsha brotherhood's ritual. *Al-unasa al-saghira* comes first and features this pattern articulated with clapping. *Al-unsasa al-kabira* returns later in the evening and uses drums. Both segments focus on sung devotional poetry that aligns with a rhythmic pattern of five beats (or five claps) that can be loosely described as short, long, short, short, long.

One of the core assumptions about rhythm in western-centric systems of understanding is that the pulse is made up of evenly-spaced beats.[11] In fact, this pattern can be mathematically broken down and written in western notation. The "long" beats are equal to three halves of the short beats, as demonstrated by this example's added imaginary pulse.[12]

Imagining this pattern as comprised of twelve beats makes it easy to create groupings of two and three. This aligns with the first hamadsha rhythm that I introduced earlier. It fits into western notation (using quarter notes and dotted quarter notes), but I argue that it fails to account for the clearly-defined nature of how these rhythms are articulated and perceived.

An example of a common variant that ornaments this pattern shows that this even pulse does not represent how the rhythm works in practice. Abderrahim Amrani and Fredrick Calmus, members of the brotherhood I worked with most closely, taught me this drum pattern that organizes and underlies the entire poetic segment of the ritual.

There are two characteristics of this poetic accompaniment that are noteworthy here. First, the beat or pulse is consistent in that it repeats over and over again, but not every beat within it is the same duration. Second, the subdivision stays duple (beats are divided in two) whether the beat is short or long. This makes some subdivisions longer and some shorter.

Perhaps this is an example of *syncopation*, discussed earlier. If we understand the subdivision to be consistent and even (as done in the above example), then the drum strokes that divide the long spaces are syncopated. They are between beats.

This pattern repeats over and over throughout the long poetic recitation, however. While it may feel syncopated at first, the listener grows accustomed to its asymmetry. If we allow for a pulse of uneven beats (some long and some short) with subdivisions that divide them in half instead of mathematically attempting to fit this into a structural conceptualization designed for a different

[11] There are some common exceptions, including when the tempo changes. The tempo is the rate of passing beats or the speed of the underlying pulse. When it increases, beats will "speed up" and the time between them gets shorter.

[12] Alternatively, these embedded examples can be understood as alternative forms of notation. While the long and short bars that represent the notes ignore much of what western notation includes, they show duration more intuitively (in some ways). Notation itself is an effort to foreground certain elements of sound that are deemed important by composers, researchers, listeners, performers, and so on. Alternative notation is common in all forms of music, including western classical music, where the work of John Cage, George Crumb, and Krzysztof Penderecki include commonly taught examples. Creating your own form of graphic representation of sound (notation) is a useful exercise for understanding how these decisions and priorities play out in practice.

set of musical traditions, then we can more closely approximate what is happening. This may sound syncopated to you. Or you might hear it as regular and expected, despite its unevenness. The point is not that one is correct: we all hear and feel music differently. Instead, the point is that we do not need to prioritize western-centric tools that might not fit the job. Try listening to the last example again and let it loop for a while. See if it starts to "sink in" over time and feel different.

Up until now, I have been using electronically created beats to demonstrate this pattern. In practice, however, there is an additional nuance. The last beat of the cycle is late. This is an example of microtiming, similar to Mongo Santamaria's "Watermelon Man." This subtle play with time that can build and release tension happens in every iteration of the pattern. It becomes a core part, though the amount of delay is open for exciting interpretation.

0.6 Conclusions

This set of short essays considers rhythm from the perspective of expectation and ambiguity. Music is something that we feel as much as we hear. It impacts us, in part, through how we sense it, not just how we hear or think about it. Rhythm works, in part, by organizing time. This final section demonstrates how we experience and understand rhythmic ambiguity and how common "rules" and western classical music-oriented understanding of rhythm can be reductive, failing to illuminate how we *feel* music.

Music and musicians set up and break down listener expectation in innovative ways and these dramatically change how we experience music. Like so many other things, music lives in systems that we internalize, but, as I hope is clear through these essays, it is at its best when we understand that the rules of those systems are made to be broken.

Part 4: Consistent Inconsistencies from Morocco Back to contents

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