

14 The Meaning of the Drumming Body

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For me, playing drums is . . . as involving to an athletic degree as a marathon is, but at the same time your mind is busy as an engineer's is, with all the calculations a drummer has to make. NEIL PEART¹

In the book *The Meaning of the Body* – after which this essay is titled – cognitive scientist Mark Johnson puts forth a philosophy of meaning based on the visceral human experience. He situates the arts among the best places to find examples of how meaning works. In his chapter on music, he claims it can ‘present the flow of human experience, feeling, and thinking in concrete, embodied forms – and this is meaning in its deepest sense’.² I can think of no musical experience more obviously visceral than the act of drumming.

Drumming is often pigeonholed as *solely* a visceral experience. But it undoubtedly has cognitive components as well, as Rush's Neil Peart aptly points out in the epigraph. This fact supports Johnson's central argument ‘that what we call “mind” and what we call “body” are not two things, but rather aspects of one organic process, so that all our meaning, thought, and language emerge from the aesthetic dimensions of this embodied activity’.³ Johnson goes on to identify ‘at least’ five levels of embodiment of mind and meaning: the body as a biological organism, the ecological body, the phenomenological body, the social body, and the cultural body.⁴

In this essay, I analyse John Bonham's performance on Led Zeppelin's ‘When the Levee Breaks’ (1971) to demonstrate how these five dimensions of the human body can reveal meaning in drumming, and how drumming – a type of music-making where it is almost impossible to hide its bodily nature – supports the idea of music as an embodied activity. I apply all five of Mark Johnson's levels to the song one at a time in order to peel back layers of meaning. In Johnson's final level, the cultural body, I propose what I term a Tonic Beat Pattern Theory based on tension and release that serves as a method of drum analysis across rock music to explain how drummers contribute to affect and meaning.

‘When the Levee Breaks’

[197] In 1968, John Bonham, John Paul Jones, Jimmy Page, and Robert Plant formed The New Yardbirds in London – and later changed the name of



Example 14.1 Beat played by Bonham in 'When the Levee Breaks' (0:00)

Note: In standard drum kit notation, the bass drum appears on what in treble clef would be the F space, snare drum on C space, and hi-hat on the G above the staff.

this band to Led Zeppelin. Their sound ranged from hard rock, heavy metal, and psychedelic rock to blues and folk. Zeppelin drew up a blueprint for generations of rockers with their mix of drums-bass-guitar-vocals, endless touring, contributions to both arena rock and album-oriented rock, theatric self-presentations onstage, and high level of musicianship. The group released their untitled fourth album – often called *Zoso* or *IV* – in November 1971. They first tried recording the album at Island Records' Basing Street Studios, eventually returning to a combination they found successful for *III*. They used the Rolling Stones mobile recording studio – also used to record the Stones' album *Sticky Fingers* – and Headley Grange, a structure originally built in 1795 as a House of Industry for the sick, elderly, orphans, and illegitimate children.⁵ *IV* contains classic Zeppelin tracks such as the raucous 'Rock and Roll' and the epic 'Stairway to Heaven'.

The album's final track, 'When the Levee Breaks', is Zeppelin's take on a song that blues artists Kansas Joe and Memphis Minnie wrote about the Great Mississippi Flood of 1927. Plant's sparse but powerful vocals soar over the drone created by Jones and Page. The groove of the song is deep and sluggish, and the main beat Bonham plays throughout the song appears in Example 14.1.

Bonham plays this beat for nearly every section of the song. Andy Johns engineered the session, and he and Bonham recorded the drums at the bottom of a three-story tall staircase in an open hallway at Headley Grange, resulting in a classic drum sound that has been sampled by everyone from the Beastie Boys ('Rhymin & Stealin') and Eminem ('Kim') to Björk ('Army of Me') and Beyoncé ('Don't Hurt Yourself').

The Biological Body

Johnson's first and most narrow dimension of the human body is the body as conceptualised completely separately from the mind: 'the body as biological organism'. He describes the biological body as follows: '[t]he principal physical locus of my being-in-the-world is the living, flesh-and-blood creature that I call "my body"'.⁶ Given this definition, John Bonham's performance on 'When the Levee Breaks' contains a biological dimension: what his body actually did to make the drums generate sound.

This level reveals Bonham's physicality as he enacted the beat patterns, fills, and groove. He struck the bass and snare in a call-and-response manner, with his right foot and left hand, in which the second bass drum part of the conversation has three syncopated hits. Meanwhile, Bonham kept time on the hi-hat with his right hand. All this activity would have made his heart beat faster than at resting, causing his blood to pump harder through his veins. His muscles, ligaments, and tendons tensed and released to allow bodily motion throughout his arms and legs. This extreme physical exertion may have caused him to sweat as well. While this reveals what Bonham is physically doing, the analysis of the drum pattern is fairly basic and perhaps the least insightful of Johnson's five levels. It describes how the sounds the listener hears are generated, but it does not reveal why listeners find pleasure in this grooviest of grooves.

The Phenomenological Body

Johnson defines the phenomenological body succinctly as 'our body as we live it and experience it'.⁷ Unfortunately for me, I did not play on Led Zeppelin's fourth album. But I can begin to understand John Bonham's experience of drumming during the recording by turning to how it feels for me as a drummer to play this pattern, drawing on Elizabeth Le Guin's work, which she calls 'carnal musicology', a connection between people who play and write about music and the composers of that music. She writes of this connection:

at its best and sweetest we might call it intimate, implying that it is somehow reciprocal. I will contend two things here: first, that the sense of reciprocity in this process of identification is not entirely wistful or metaphorical, but functions as real relationship; and second, that this relationship is not fantastic, incidental, or inessential to musicology. It can and should be a primary source of knowledge about the performed work of art.⁸

Le Guin's insights prompt questions. How does my body carnally connect with John Bonham when I drum this pattern? What can my analysis gain from my experience of drumming? The answer is simple; my body feels as if it is in the ultimate state of groove.

But what does it mean to be 'in a groove'? In *Presence and Pleasure: The Funk Grooves of James Brown and Parliament*, Anne Danielsen wants to understand funk 'as lived experience'.⁹ She writes, '[b]eing in a groove, feeling the right feeling, letting presence happen, from the inside, from a position within time, within the experiential now, this is probably what funk is all about'.¹⁰ Here, Danielsen attempts to capture in words the essence of being in a groove, and her claim could apply to many

groove-based musics, including ‘When the Levee Breaks’, in which a single beat pattern takes up the vast majority of the song. When one impulse happens for such a long time in a song, it brings you into the present moment of that song in a way that songs with more defined sections do not. *Rhythm* magazine readers certainly agree, naming ‘When the Levee Breaks’ the ‘[g]reatest groove of all time’.¹¹ The song often ranks on lists of the most sampled breaks in hip-hop alongside legendary funk grooves such as The Winstons’ ‘Amen, Brother’ and James Brown’s ‘Funky Drummer’.¹²

Bonham’s infectious groove – in Example 14.1 – oozes with laid-back ease. This pattern is as unbelievably satisfying to play as it is to hear. As I play it, I connect carnally with Bonham. The basic drum pattern consists of three components. First, as in any standard backbeat pattern, the snare strikes on two and four. The tempo enables my hand to fall into place for a slow crack on the snare – where I have plenty of time to lift my left hand high and smack it down firmly in the pocket. The ever-so-slightly-open hi-hat keeps time with straight eighths, a very common way to keep time over a backbeat. At that tempo, my right hand can remain loose in a way that it cannot at some fast or even mid tempos, allowing for a slack push-and-pull in the groove. The bass drum simply pounds on beat one for the first half of the pattern, leaving loads of aural space until the first snare crack on beat two.

The true magic happens with the bass drum in the latter part of the one-measure pattern. The bass drum feels early, entering a sixteenth note before beat three and making my body sway a bit as I play it – yearning not so much with anticipation, but with pleasure. The ‘early’ hit feels natural, almost necessary, because of the groove’s depth and almost sluggish tempo. Difficult to get just in the sweet spot, this early bass drum hit’s payoff is simply euphoric. Beat three aches because of the absence of the bass drum, which flirts with the beat but never touches it. Then, I anticipate the snare backbeat on four with a couple gallops of the bass drum, filling in significantly more of the space in the second part of the measure than the first.

But one musical element both enriches and complicates the phenomenological dimension of this analysis: tempo. I cannot connect fully to Bonham’s bodily experience of playing because I do not know at what tempo he recorded this beat. The wash of the cymbal indicates that the drums were recorded faster and slowed down for the track – but I can only confirm this because of my experience as a drummer, who has heard and played so many cymbals throughout my life.¹³ When my body plays along with the recording, my physicality does not actually enact the pattern in the way that Bonham does on the record. The link between his

phenomenological experience and mine is not broken, but it is fractured. Still, the result of this phenomenological layer of analysis is a deep, pleasurable groove for the listening experience.

The Ecological Body

The final three dimensions all relate to environment – ecological, social, and cultural. Johnson takes into account the environment because ‘[h]uman mind and meaning require at least a partially functioning human brain within at least a partially functioning human body that is in ongoing interaction with complex environments that are at once physical, social, and cultural. These environments both *shape* and *are shaped by* the humans who inhabit them’.¹⁴ Under the third dimension – the ecological body – he explains, ‘[t]here is no body without an environment, no body without the ongoing flow of organism-environment interaction that defines our realities’.¹⁵ Our interactions with the world define and shape our bodies. In the case of ‘Levee’, I turn to two factors of ecological environment: the physical, architectural space around the drums at the famous recording spot Headley Grange, and the sonic space created by the Binson echo unit used in production.

The physical reverberation of the stone walls of Headley Grange ‘had a significant impact on the sound. Because stone is, acoustically speaking, a highly non-absorbent material, the sound waves were reflected within the stairwell with a greater intensity than if the walls were composed of a more absorbent material’.¹⁶ But the engineers still needed to capture the natural echo on record. Andy Johns remembers hanging ‘two ambient Beyer M160 stereo microphones over the kit, one 10 feet up, the other about 20’.¹⁷ This mic placement in combination with the open, echo-producing stone structure gave the drums a fabricated live sound.

Do not confuse this physical echo with the sixteenth-note delay on the track. For that, Johns went beyond the literal space of Headley Grange to layer a sonic space onto the already-complex body/environment Bonham enacted with his drumming. Outside, in the Rolling Stones mobile studio, Johns put the drums into two channels, compressed them, and ran the signal through a Binson echo unit: a machine owned by Jimmy Page that used an analogue magnetic drum recorder to produce a signal delay.¹⁸ This machine – not the natural echo of Headley Grange – translates to the delay that falls a sixteenth note after each drum hit. Example 14.2 shows the result, which is closer to what the listener actually hears.

Because the delay lands exactly a sixteenth note after the physical hits, it ends up sounding like John Bonham is playing ghost notes after every snare and bass hit – the key component that makes the beat so unique. This delay



Example 14.2 Heard Beat Pattern for 'When the Levee Breaks' (0:00)

adds texture to the sounds, creating a spatial effect of being in an even bigger, more echo-filled space than Headley Grange – a canyon, perhaps. The large space between the hits allowing for the sixteenth-note delay also creates a disconnect between what Bonham's biological body enacts and what the listener ends up hearing and connecting to, which is Bonham's bodily engagement with both physical and technological environments.

In the early 1970s – an era when most drummers dampened their drums and engineers recorded them with close microphones – the full, life-like sound that Bonham and Johns produced stands out. It forges a bond between listener, Bonham, and the multiple spaces of the song. The physical spaces of John Bonham's drum kit and Headley Grange affect the listening experience, but so does the virtual space of the Binson Echo unit. Together, they create a new space that only exists in 'When the Levee Breaks'.

The Social Body

All of the previous levels ended with a consideration of the listener, leading us to Johnson's fourth level: the social body. He writes, '[t]he human environment of which the body partakes is not just physical or biological. It is also composed of intersubjective relations and coordinations of experience'.¹⁹ For 'When the Levee Breaks', the biological body is the force that generates the sounds that the listener hears. The phenomenological body allows listeners and performers to carnally connect to the groove of the song. The multifaceted spaces surrounding the recording of the drums affect the ecological body.

Significantly, Bonham's body, manipulated technologically by Johns (another agent), interacts with the listener – though not in real time. When listeners can't help but move to 'When the Levee Breaks', their bodies connect to more than Bonham's physical, biological body, even more than the phenomenological experience of simply being in the groove; they connect to the reverberant, stone-walled space of Headley Grange and to the technological space that allowed for a perfect delay that fit smack dab in the middle of those wide open spaces between drum hits. Perhaps this explains why Led Zeppelin only played 'Levee' in concert a few times: the technological environment required for the groove and feel of the track – which went beyond Bonham's drums to include tempo

manipulation, panning, and a backward echo effect on the harmonica – could not be adequately recreated in a live setting in the 1970s. The magic just didn't translate.

The Cultural Body

The listener cannot find meaning in 'When the Levee Breaks' if it exists in a vacuum. Johnson's fifth and final dimension, the cultural body, provides the greater context that makes the first four dimensions matter. Johnson explains:

Our environments are not only physical and social. They are constituted also by cultural artifacts, practices, institutions, rituals, and modes of interaction that transcend and shape any particular body and any particular bodily action . . . Cultural institutions, practices, and values provide shared ('external') structures that influence the development of our bodily way of engaging our world.²⁰

The main culture that affects 'When the Levee Breaks' and its relation to Bonham's body is Western rock music. And the backbeat occupies a central cultural locus of meaning in Western rock drumming. In another essay in this volume, Steven Baur calls the backbeat 'one of the single most prevalent features of Western popular music'.²¹ Audiences learned to expect and desire the backbeat well before the rock era, and it gained cultural power when both its adherents and detractors emphasised its centrality to the new sound during the 1950s Big Bang of rock and roll.²² People figured out how to move to it and the seemingly endless patterns in which it can occur not only through its affective dimensions, but also, through cultural institutions of rock such as variety shows (e.g. Ed Sullivan, Milton Berle), dance music party shows (e.g. American Bandstand, Soul Train), and live concerts. In many ways, the backbeat *is* rock culture; it is how our bodies culturally interact with rock music.

I want to distinguish between the backbeat and what I call the backbeat pattern. The backbeat is the accent on the weak beats of the measure – in standard 4/4, beats two and four – most often played in rock by the snare drum. The backbeat *pattern* includes the backbeat itself, but also two other components. The bass drum falls on or around beats one and three and creates a call and response pattern with the snare backbeat. For the final component, drummers designate an instrument – often a cymbal – to perform a steady time-keeping function.

In his essay on soul music, Robert Fink demonstrates that rhythmic goal direction occurs in popular music, that a single song can exhibit both groove and teleology, and that certain beat patterns can serve as a rhythmic

‘tonic’ that allows for patterns of tension and release. For his example of this phenomenon, he looks at another core beat pattern: the Motown four-on-the-floor pattern.²³ Drummers apply this tactic in all genres and styles, and rock drummers most often manipulate audience expectations of the backbeat pattern. I term the core groove of a given song – that beat that the drummer plays that feels like ‘home’ – the tonic beat pattern. A song’s tonic beat pattern is often some variation of the backbeat pattern, or of another core stylistic beat pattern – i.e. disco four-on-the-floor, train beat, or reggae. While multiple variations of the backbeat might appear in a particular song, each song only has one true tonic beat pattern.

Drummers go away from, and return to, the tonic beat pattern to design these tension and release patterns in several ways, and this is the crux of the Tonic Beat Pattern Theory. It can take place on a small scale when, say, drummers build tension through drum fills. These embellishments instill unease in the listener because they momentarily obscure the integrity of the tonic beat pattern, temporarily compromising the song’s underlying stability. For this reason, fills regularly lead into new sections of the songs, as they make the return of a beat that much more satisfying. In Nirvana’s ‘Smells Like Teen Spirit’, for example, Dave Grohl uses largely sixteenth-note-based snare drum fills to transition between sections. He plays a steady backbeat pattern through the verse, modifies it slightly for the pre-chorus, and plays loud sixteenth notes to build tension before the explosion of the chorus, where he plays a louder, more complex backbeat pattern. In effect, Grohl establishes a steady beat, uses a fill to create tension, and then releases that tension through going into another steady beat.²⁴

The Tonic Beat Pattern Theory also works on a larger scale. Some drummers withhold a steady backbeat for a section of a song, often saving it for the chorus. Benny Benjamin’s thumping tom-tom pattern emphasises beats one and three in verse one of Barrett Strong’s ‘Money’, eliminating the backbeat and the snare altogether. When the chorus pattern comes in with snare backbeat on two and tom backbeat on four, it feels utterly resolved. Other drummers take this practice to its logical conclusion by holding back that which becomes a tonic beat pattern for minutes of a song. In Hole’s ‘Violet’, Patty Schemel alternates two patterns: one obscures the backbeat by offsetting the first snare hit a half a beat, while in the other, she simply plays a quiet four-on-the-floor bass with uneven rim clicks on the snare. These patterns feel partially resolved at times – particularly after interruptive drum fills – but there is clearly something missing. In the very last chorus, she unleashes that ever-gratifying, full-blown backbeat almost three minutes into the song – finally supplying the listener with the song’s tonic beat pattern. Try as I may, I cannot find a

single tune in rock music that has drumming that does not adhere to the Tonic Beat Pattern Theory. These tension and release patterns work always and only culturally. They are the primary way that drummers shape musical meaning and steer the narrative in rock music.²⁵

‘When the Levee Breaks’ is no exception, and applying the Tonic Beat Pattern Theory to it reveals deeper meanings than Johnson’s first four levels. The tonic beat pattern as played by Bonham appears in Example 14.1, whereas the tonic beat pattern as heard appears in Example 14.2. The form diagram of the song appears in Table 14.1.

The song contains two large-scale iterations of essentially the same thing – instrumental verse, interlude, verse, interlude, bridge – bookended by an intro and outro. The song lacks any true chorus, significantly, which contributes to the drone-like feeling of the piece, as does the literal drone in the guitar and bass in the intro, verses, and outro. The tonic beat pattern

Table 14.1 *Form diagram of ‘When the Levee Breaks’*

<u>LARGE FORM</u>	<u>FORM</u>	<u>TIME</u>	<u>PHRASING</u> (in mm.)	<u>BEAT PATTERN</u>	<u>FILL</u>
INTRO	Intro	0:00	2	tonic	
ITERATION I	Instrumental verse	0:07	16+2	tonic	tonic+
	Interlude	1:08	4+1	tonic backbeat+ alternating w/ punches	(silence)
	Verse	1:25	7+7	tonic	tonic+
	Interlude	2:12	4	tonic backbeat+ alternating w/ punches	
	Bridge	2:25	4+4+4	silence/crash; backbeat w/ active BD; backbeat w/ fills	one busy SD/ tom; others simple
ITERATION II	Instrumental Verse	3:04	14	tonic	tonic+
	Interlude	3:51	4+1	tonic backbeat+ alternating w/ punches	(silence)
	Verse	4:08	8+6 (vox) [7+7 (gtrs)]	tonic	tonic+
	Interlude	4:55	4	tonic backbeat+ alternating w/ punches	
	Bridge	5:09	4+4+4	backbeat w/ active BD	more virtuosic throughout
OUTRO	Outro	5:47	10+8+3½	tonic	few; SD/rolls

beat pattern abruptly stops. The levee has reached catastrophic failure through massive collapse. Water flows freely, and the vocalist's fears have come true. The listener can only hope he actually started his journey to Chicago before it was too late.

Just as Liu-Rosenbaum showed how close attention to recording practices can help understand 'Levee', my analysis shows how close consideration of drums can contradict those meanings. In his reading, the backbeat is the water – the dangerous antagonist. The drums in this song do not feel dangerous at all, however; the backbeat rarely does to fans. The backbeat in general, and the tonic beat pattern in 'Levee' specifically, feel pleasurable, comforting, and reliable – like an old friend. They constitute what audiences have come to expect through decades of reinforcement. In Mark Johnson's chapter about music in *The Meaning of the Body*, he states, 'music is meaningful because it can present the flow of human experience, feeling, and thinking in concrete, embodied forms – and this is meaning in its deepest sense'.²⁷ Throughout 'When the Levee Breaks', John Bonham does just that – by harnessing the cultural, bodily signifying abilities of the backbeat, he crafts the song's narrative and contributes to its affective meanings.

The Power of the Drums

In "The Pride of Noise": Drums and Their Repercussions in Early Modern England', Christopher Marsh writes about the myriad signifying possibilities of the drum at that time, demonstrating how drums were used as powerful communication tools. He writes:

the meanings of drumming were absorbed at a personal level by a kind of cultural osmosis. Just as the soldier learned to heed the signals beaten out by the military drummer, so the civilian developed the ability to interpret the rhythms that cut through the air in town and village. The beating of a drum was an irresistible sound, capable of stimulating not only hope, happiness, excitement and bravery but also anxiety, fear, anger and misery. It all depended on where one stood and how one listened.²⁸

For Marsh, the drum held immense power to communicate in Early Modern England. In rock, the same thing holds true; listeners absorb the narratives that drummers weave by a kind of cultural osmosis. Through their lifetime's worth of knowledge of, and experience with, the tension and release patterns drummers craft, rock fans are expert listeners and interpreters of the moves drummers make. When session drummer Hal Blaine omits half the backbeats on his iconic 'Boom . . . boom boom CRACK' beat pattern at the beginning of the Ronettes' 'Be My Baby' and

then resolves that tension by playing all backbeats in the chorus, and when Meg White withholds the powerful crash cymbal timekeeper until the choruses of the White Stripes' 'Seven Nation Army', they show how drummers create musical trajectories in songs that not only make fans wiggle our hips, move our feet, and bang our heads, but also, create just about any affect the song calls for.

My hope for this essay is that it provides popular music scholars the necessary theory and methods to weave drummers' musical contributions more fully into the conversation. The Tonic Beat Pattern Theory provides insights into just about any song in the twentieth or twenty-first centuries that has anything meant to fill the role of a drummer: from acoustic and electronic drum kits to drum machines and computer patches. We can no longer ignore or diminish the instrument that most urges people to move and groove and connects to their bodies. In the words of James Brown, 'give the drummer some'.

Notes

- 1 W. F. Miller. 'Neil Peart', *Modern Drummer* (February 1994), p. 64.
- 2 M. Johnson. *The Meaning of the Body* (Chicago and London: University of Chicago Press, 2007), p. 236.
- 3 Johnson, *The Meaning of the Body*, p. 1.
- 4 Johnson, *The Meaning of the Body*, pp. 275–78.
- 5 B. Hoskyns. *Led Zeppelin: Zoso* (New York: Rodale, 2006), p. 59.
- 6 Johnson, *The Meaning of the Body*, p. 275.
- 7 Johnson, *The Meaning of the Body*, p. 276.
- 8 E. Le Guin. *Boccherini's Body: An Essay in Carnal Musicology* (Berkeley: University of California Press, 2005), p. 14.
- 9 A. Danielsen. *Presence and Pleasure: The Funk Grooves of James Brown and Parliament* (Middletown: Wesleyan University Press, 2006), p. 11.
- 10 Danielsen, *Presence and Pleasure*, p. 204.
- 11 C. Welch and G. Nicholls. *John Bonham: A Thunder of Drums* (London: Backbeat Books, 2001), p. 157.
- 12 See, for example, G. Akkerman. *Experiencing Led Zeppelin: A Listener's Companion* (Lanham: Rowman & Littlefield, 2014), p. 61; D. S. 'These Are the 5 Most Sampled Drum Beats in Hip Hop', *Produce Like a Pro* (14 September 2007), available at: <https://producelikeapro.com/blog/5-most-sampled-drum-beats-in-hip-hop/>; and C. Reiff. 'These Are the Breaks: 10 of the Most Sampled Drum Beats in History', *AV Club* (26 August 2015), available at: <https://music.avclub.com/these-are-the-breaks-10-of-the-most-sampled-drum-beats-1798283974>.
- 13 C. Eddy. 'The Making of Led Zeppelin's Zoso', *Rolling Stone* (15 May 1997), p. 74.
- 14 Johnson, *The Meaning of the Body*, p. 279. Italics his.
- 15 Johnson, *The Meaning of the Body*, p. 276.
- 16 A. Liu-Rosenbaum, "A Kind of Construction in Light and Shade": An Analytical Dialogue with Recording Studio Aesthetics in Two Songs by Led Zeppelin', unpublished dissertation, City University of New York (2009), p.31.
- 17 Hoskyns, *Led Zeppelin*, p. 107.
- 18 'The Truth behind Led Zeppelin's When the Levee Breaks' video explains this process well. Rick Beato, 'The TRUTH Behind Led Zeppelin: When the Levee Breaks', *YouTube*, available at: www.youtube.com/watch?v=XZYDDX1DHDU (accessed 15 October 2019).
- 19 Johnson, *The Meaning of the Body*, p. 277.
- 20 Ibid.

- 21 S. Baur. 'Toward a Cultural History of the Backbeat', in M. Brennan, J. Michael Pignato, and D. Akira Stadnicki (eds.), *The Cambridge Companion to the Drum Kit* (Cambridge: Cambridge University Press, 2021).
- 22 Ibid.
- 23 R. Fink. 'Goal-Directed Soul? Analyzing Rhythmic Teleology in African American Popular Music', *Journal of the American Musicological Society* 64:1 (Spring 2011), pp. 197–237.
- 24 Notice how Grohl enters the song with a drum fill, demonstrating that drummers do not need to start with the tonic beat pattern.
- 25 At first, I thought 'Heroin' by the Velvet Underground broke the rule, but Maureen Tucker clearly plays with the faster galloping pattern as the tonic beat pattern, using silence, fewer drum hits, and slower tempos as the tension to the gallop's release.
- 26 Liu-Rosenbaum, 'A Kind of Construction in Light and Shade', pp. 33–41.
- 27 Johnson, *The Meaning of the Body*, p. 236.
- 28 C. Marsh. "'The Pride of Noise': Drums and Their Repercussions in Early Modern England", *Early Music* 39:2 (May 2011), p. 216.