



UNIVERSITY OF LEEDS

This is a repository copy of *'Modulation' by Richard Powers: Digital sound, compression and the short story.*

White Rose Research Online URL for this paper:  
<https://eprints.whiterose.ac.uk/176498/>

Version: Accepted Version

---

**Article:**

Hedges, M (2021) *'Modulation' by Richard Powers: Digital sound, compression and the short story.* *Short Fiction in Theory & Practice*, 11 (1-2). 16. pp. 161-176. ISSN 2043-0701

[https://doi.org/10.1386/fict\\_00042\\_1](https://doi.org/10.1386/fict_00042_1)

---

© Hedges, Michael, 2021. The definitive, peer reviewed and edited version of this article is published in *Short Fiction in Theory & Practice*, Volume 11, Numbers 1-2, June 2021, pp. 161-176(16), [http://doi.org/10.1386/fict\\_00042\\_1](http://doi.org/10.1386/fict_00042_1)

**Reuse**

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

**Takedown**

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing [eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk) including the URL of the record and the reason for the withdrawal request.



[eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk)  
<https://eprints.whiterose.ac.uk/>

## **‘Modulation’ by Richard Powers: Digital Sound, Compression and the Short Story**

### **Introduction**

‘Modulation’ (2008) by Richard Powers is one of only a small number of short stories that the Pulitzer Prize-winning American author has published to date. In a career now spanning five decades, Powers has instead garnered a reputation as a writer of long, challenging novels brimming with complexity. In *Galatea 2.2* ([1995] 2010), he asked whether artificial intelligence might one day be capable of producing literary analyses; in *Plowing the Dark* ([2000] 2002), he considered the impacts of virtual reality on visual art; and, most recently, he published *The Overstory* (2018), a revelatory work of climate fiction. Elsewhere in his remarkable bibliography, Powers has tackled genetics and neuroscience in *Generosity: An Enhancement* (2009) and *The Echo Maker* ([2006] 2007) respectively. Powers is also held in high regard for writing about music with expertise and flair. *The Gold Bug Variations* ([1991] 1993), *The Time of Our Singing* ([2002] 2003) and *Orfeo* (2014) are rightly celebrated as leading examples of the ‘musical novel’ form (Petermann 2014: 2). In an interview with *Music & Literature*, Powers addresses how – and to what ends – these novels ‘explore the common features between prose and sound’ (McCracken 2014: n.pag.).<sup>1</sup> Powers’s work, then, consistently emerges from where technology, science, art and information intersect.

‘Modulation’ represents Powers at his ruminative best. First published in the literary journal *Conjunctions*, the short story recounts the spread of a malignant digital music file that momentarily renders the world’s MP3 players inoperable. Across some thirty pages, Powers contemplates the effects of digitalization on how recorded music sounds and considers the repercussions of music becoming freely available – literally – with the advent of illegal file sharing. In this respect, ‘Modulation’ is quintessentially Powers, since it operates at the intersection of the four topics at the heart of his fiction more generally: technology, science, art and information. Powers has been preoccupied with addressing the questions that these topics invite ever since *Three Farmers on Their Way to a Dance* ([1985] 2010), his debut novel. He is, therefore, something of an authority on using fiction to explore, if not to answer questions such as: Is it possible to ‘create a literature that extend[s] the novel into scientific disciplines and ways of thinking about the world that are ordinarily left to nonfiction’ (Peters 2013: n.pag.)? How, if at all, can literary narrative ‘reflect the explosion of data that typifies life in the information age’ (Burn 2008a: 173-174)? And if – as Powers has asserted – the ‘data structure’ is the ‘pre-eminent medium’ of the age (Powers 2000a: 15), what does this mean for music that exists as data, like the MP3? This article directs these questions at ‘Modulation’ to consider whether Powers’s philosophy of fiction holds true for the short story form, or whether it is the sole-charge of lengthy information novels to represent the information age.

I argue that the MP3 and certain short story forms share at least one characteristic: they are both compressed representational modes. I am not suggesting that this applies equally across all short stories, but rather to a subset of the form that I am calling the information short story. I limit my consideration throughout this article to short stories – like ‘Modulation’ – which establish multiple contexts for narrative action or cover sizeable periods of story time, only to manifest as discourse somehow in tension with the scope and content of the events they narrate. Short stories of information operate with a palpable sense of omission that exceeds other forms of narrative prose. This results from the tension between the relative paucity of narrative data produced by information short stories when compared against the surfeit of data that distinguishes their object of representation: the information age. The equivalence I draw between short stories and compression is purely metaphorical and consciously inexact. As I will illustrate, compression in digital sound has no bearing on the duration of an audio

recording: a compressed file storing a piece of music, for example, is identical in length to an uncompressed version of the same recording. Any change to an audio file happens along what we can think of as its y-axis during compression, lowering its bit depth, or reducing the number of bits available for each sample. Clearly, however, describing a narrative prose form as compressed has implications for its length. It implies the existence of an uncompressed alternative, however notional, which would necessarily take shape as a longer sequence of language. Equally, we lack the vocabulary and desire to talk about the y-axis of linguistic narrative – the paradigmatic relations between present and absent signifiers – with anything like the precision of bit depth. We can account for the exact amplitude values that an MP3 does and does not signify when (re)producing compressed digital audio from an uncompressed original; any attempt to do the same with compressed and uncompressed narrative discourse can only ever remain conjectural. These are obvious senses in which any comparison between short stories and compressed data does not amount to a one-to-one correspondence. Nevertheless, this does not detract from the value of compression as an exploratory metaphor within short story scholarship. In fact, this article takes its cue from the recurrence of the term across foundational works of short story theory (Cortázar 1994; May 1994). MP3s and short stories like ‘Modulation’ avow the value of less information, less data, in handling their respective objects of representation: audio in the former and story in the latter. These processes of compression have forged new patterns of consumption and reception, for which MP3s and short stories have faced comparable accusations of commodification and degradation in fidelity and literary quality respectively. Compression is central to the exchange and consumption of digital culture. It is therefore apt that Powers uses a compressed manner of representation to examine the social and material relations which have developed between compressed digital sound, its producers and its consumers.

‘Modulation’ gives us occasion to reflect on the significance of the MP3 in its technical and cultural guises. My analysis of the story offers answers to the three questions I derived from Powers’s philosophy of the novel above. Answering the first is straightforward enough. ‘Modulation’ uses fictional narrative in its handling of a subject matter, the MP3, that is ‘ordinarily left to nonfiction’ (Peters 2013: n.pag.). The story sacrifices little of the rigour one would expect of less literary writing on digital music, and – as I have already suggested – this is typical of Powers’s fiction more broadly. His is a literature that ‘extends into scientific disciplines’, or – to borrow Stephen J. Burn’s words – enacts a ‘sophisticated synthesis of diverse fields of knowledge’ (Peters 2013: n.pag.; Burn 2008b: xi). Specifically, ‘Modulation’ includes thought-provoking passages on eclectic musical genre, data storage and dynamic range compression. These passages demonstrate the relationship between the MP3 as an abridged representational mode and how their truncated data structure has affected how music is consumed.

‘Modulation’ has significance beyond itself. I mean this primarily in terms of how the story pertains to Powers’s other writings, particularly his longer novels. Powers categorizes *The Gold Bug Variations*, for example, as a ‘novel of information’ because of how it employs an excess of information – be that genetic, musical or computational – to ‘reflect the explosion of data that typifies life in the information age’ (Burn 2008a: 173-174). At more than 600 pages, *Gold Bug*’s length is integral to the novel’s effect in replicating informational overabundance. ‘Modulation’, however, adopts an altogether smaller ‘data structure’ (Powers 2000a: 15). The story’s short narrative is, I contend, akin to the compression of the MP3 format. Powers sheds his prose of its characteristic maximalism to house his tale within the confining architecture of the short story form. With striking similarity, the MP3 format surrenders harmonics and transients to fit a song into a handful of megabytes. Author and recording remain recognizable despite the data lost through these processes of compression.

After looking at 'Modulation' in detail, I will superimpose established theories of the short story onto Jonathan Sterne's research into the central significance of compression to the MP3 format. I then use Barbara Herrnstein Smith's theory of narrative versions to enrich the picture that emerges from this superimposition (Smith 1980). This creates an overlay of short story theory, media studies and narrative theory, which reveals the kernel of my argument: that Powers's 'Modulation' uses a short story form, compressed in its manner of representation, to narrate the MP3, which is itself a compressed manner of representation. This is a noteworthy alternative to Powers's information-rich novels of information, which skew the fictional representation of the information age in favour of excess. 'Modulation' captures the importance of compressed data structures to the flow of information as digital media.

### **Music as 'cultural artifact' and 'cultural commodity' in 'Modulation'**

'Modulation' is a cautionary, parabolic tale that navigates the pros and cons of music's free dissemination as MP3 files. It takes the form of four distinct narrative strands, connected only by the implication that their protagonists each encounter the same nomadic, hostile MP3: a reformed hacker discovers the computer virus, and immediately sets out to curb its proliferation; a virtuosic maestro of the sampler-cum-drum machine travels from Los Angeles to Sydney to perform nostalgic 8-Bit video game remixes; a retiring ethnomusicologist is perturbed to learn that his life's work can fit onto his newly-gifted smartphone; and a Brazilian journalist returns from a research trip to Iraq with a mysterious earworm lodged in her head.

On the one hand, 'Modulation' calls attention to the utopian potential of the MP3 format to democratize music for listeners. It takes music beyond 'the economics of value by enabling its free, easy and large-scale exchange' (Sterne 2006: 831). It should be noted that Sterne qualifies this assertion, pointing out that the MP3 has a complicated relationship with 'exchange-value' and 'use-value' because 'people [often] do not buy them' (2006: 831).<sup>2</sup> Affordable data storage, lax regulation and the MP3's universal compatibility turned the internet in the first decade of the twenty-first century into a virtual plane where recorded sounds could assemble and come free from the music industry's meddling. These sounds were downloaded and repurposed into new generic forms and compiled at no extra cost to the consumer into immense collections, to which anyone with an internet connection and a hard drive could add or access. On the other hand, in 'Modulation', the apotheosis of music's liberation through file sharing is – as Powers presents it – the absence of recorded sound, silenced as a consequence of its own devalued propagation. The rogue file risks destroying 'billions of dollars' worth of portable media centres', prompting fears that '[p]ersonalized music would never be safe again' (Powers 2008: 99). Then, 'Modulation' takes an unexpected turn. In perfect synchrony, infected devices across the world begin playing a piece of music unlike anything anyone has heard before. Whoever hears the recording is overawed by its genre-defying newness. The story ends with the file seeming to disperse even more rapidly than it appeared, leaving a confused worldwide audience to come to terms with what has just happened.

'Modulation' tells us a great deal about the MP3 as a 'cultural artifact' (Sterne 2006: 825). Sterne uses this term to encourage media-conscious sound studies researchers to approach the MP3 as 'a result of social and technical processes, rather than as outside them somehow' (2006: 826). In other words, if we are to theorize the MP3 adequately, we must look past its apparent dematerialization and subject its design and application to stringent analysis. I will make use of some of Sterne's conclusions to guide my reading of Powers's short story. Sterne has written at length about the MP3 as 'artifact', arguing that the format is 'shaped by several electronics industries, the recording industry and actual and idealized practices of

listening' (2006: 826). Powers, too, has spoken of how his writing on music addresses 'the changing nature of the use of music as a cultural commodity' (McCracken 2014: n.pag.). 'Modulation' is a story about precisely the contingent relationship between how MP3s are designed, how they sound and how the format has been used.

### **The MP3 as a compressed representational mode in 'Modulation'**

The MP3 remains 'the most common form in which recorded sound is available today' (Sterne 2012: 1), and compression is absolutely fundamental to its popularity. Its small size in comparison to files that have not undergone data compression allows for their uncomplicated exchange and economical stockpiling.<sup>3</sup> 'Modulation' narrates instances of both. Sterne points out that, '[b]ecause it is so small, the MP3 format makes collecting all that much easier: an entire collection can fit in a relatively small space' (2006: 832). Likewise, owing to their size, MP3s are less difficult to exchange over the internet than larger, uncompressed digital audio files. Sophisticated encoders calculate what can be lost from the uncompressed audio based on the details they deem redundant: as Sterne puts it, the MP3 'pre-emptively discards data in the sound file that it anticipates the body will discard later, resulting in a smaller file' (2006: 833). MP3s have been algorithmically downsized, made smaller by the careful removal of frequencies that its codecs think the listener cannot hear, leaving all but the most indispensable information.

MP3s, then, are versions of versions the very form of which shapes how they are circulated and consumed. The format alters the audio it holds according to principles of refinement and erasure. 'Modulation' is a short story largely about the MP3 as a 'container technology' (Sofia 2000: 181), or a technology that 'transforms its contents' (Sterne 2006: 828). These transformations are realized as 'social and material relations' which determine how MP3s sound, as well as the functions they serve (Sterne 2006: 826). In turn, the intersection of these relations warrants approaching the MP3 as a cultural artifact.

The MP3 reflects the principles of micromaterialization that have guided the recording industry in its transition from analogue storage media to the microprocessors on which digitally reproduced sound depends. Though they seem insubstantial, MP3s exist as part of a much larger and very material network of consumer electronics and telecommunications. Kyle Devine's research into music's political ecology highlights the inaccuracy of describing digital sound recordings as dematerialized, owing to their complex dependence on 'accessory hardware' (Devine 2019: 135-146). This includes 'dedicated listening devices such as iPods', as well as laptops and smartphones, which now function 'partly (but significantly) as music devices' (2019: 141). This is not to mention the energy-intensive infrastructure of servers, satellites and fibre optic cabling that makes streaming and downloading music possible. Nevertheless, a vast personal collection of music encoded as MP3s simply occupies less physical space than the same collection would were it stored on CDs and vinyl records.

'Modulation' illustrates the MP3 format's portability and relative micromateriality. One of the story's four protagonists is Jan Steiner, the retiring ethnomusicologist who receives a smartphone from his colleagues as a parting gift. It comes 'preloaded with every piece of music he has ever written about, recorded, or championed' (Powers 2008: 91). This database runs to 'hundreds of hours' (2008: 96). The virus takes its place alongside thousands of other compressed music files on his smartphone, one of millions of players to have been affected. As he clears his office of paperwork arranged into 'towering stacks' (2008: 97), Steiner delves deep into his digital archive. He effortlessly flits from 'a traditional Azerbaijani mourning song' to 'an ecstatic Ghanaian instrumental' among the 'Turkish hymns and Chinese work-camps songs, gamelan orchestras and Albanian wedding choirs, political prisoners' anthems

and 1930s radio jingles' (2008: 96, 91). Steiner grows frustrated that the music he has spent his career researching has now been 'arranged for an instrument that everyone could learn to play without any effort' (2008: 91). Though a source of disillusionment for Steiner, this is precisely the MP3's mass appeal. Sterne writes that 'because of their micromaterialization, users can handle MP3s quite differently from the recordings they possess in a more obviously "physical" form such as a record or compact disc' (Sterne 2006: 832). One obvious difference is the speed and ease with which Steiner cycles through an impressive array of eclectic recordings. He 'grabs the device, flips it on, and blunders through the menu screens, looking for a song he might somehow, by accident, have blessedly forgotten (Powers 2008: 91). Powers's choice of verbs here, in 'grabs', 'flips' and 'blunders', suggests either Steiner's carelessness or his unfamiliarity with the phone. He treats it, and the digital recordings it contains, with an almost callous disdain and a disposability that eludes him elsewhere; after all, it 'would stop his valve-repaired heart' to throw out any of the monographs that 'bulge off the shelves' or to rid himself of the '[f]olders and collection boxes' which 'stack almost to the fluorescent lights' in his office (2008: 90). And yet Steiner is prepared to 'blunder' his way through his treasured collection on a device that only 'incidentally' plays music (2008: 91). The device is also 'a clock, calendar, appointment book, phone, [and] Web browser' (2008: 90). As Powers himself said, this is 'the explosion of data that typifies life in the information age' (Burn 2008a: 173-174). Steiner's music is subsumed into the blast.

Steiner's relationship with music is changed on account of the MP3 being a container technology. Broadly speaking, container technologies store where other technologies act. In practice, these two roles are harder to separate than it might seem at first, because container technologies often act on whatever it is that they store. Zoë Sofia dubs a container technology of this sort an apparatus. These container technologies, she writes, are designed 'to make their presence felt, but not noticed' (2000: 188). Sterne artfully extends the remit of the container technology to include the MP3 in his article published in *New Media & Society*:

[MP3s] are important precisely because they are useful but do not call attention to themselves in practice. They take up less space than other kinds of digital recordings and when they are listened to, they are experienced as music, not as file formats. Thus, we should not be surprised to find media among Sofia's many examples of container technologies. (2006: 828)

The MP3 files on Steiner's smartphone purport to offer unobtrusive conduits to versions of his recordings. He is able to sample a wide variety in quick succession, because the MP3 encoder has rendered the files small enough to co-exist with one another on the same device. Steiner manoeuvres between them with all the simplicity of flicking a switch (Powers 2008: 96), bemoaning, as he listens, how 'all these sounds have become so achingly predictable' (2008: 95). His opinions are likely to be accentuated by the very mode of listening that the MP3 format engenders, inconspicuously concealing its philosophy of efficacy behind the conclusions it enables Steiner to draw. His smartphone grants him novel listening conditions through which the veteran researcher can re-appraise his work. As he reluctantly begins to clear his office, Steiner 'leaves the player on shuffle, letting it select his life's tracks at random' (Powers 2008: 97). He is likely never to have consumed these recordings in this way, and their haphazard arrangement is what modulates Steiner's opinion of his music collection away from reverence and towards indifference.

It is the MP3 format's micromaterialization of his work, such that Steiner can hear so many of these pieces consecutively, that most candidly exposes his collection's predictability.

That is, until Steiner hears the story's viral song, the arrival of which the story's heterodiegetic narrator describes thus:

He can't quite say whether he's ever heard it before, or even what scale or mode or key it wants to be in. As far as he can tell, this track – if it is a *track* – has gotten away safely, innocent, never repackaged, let alone heard by anyone. (2008: 97, original emphasis)

Steiner is relieved to hear something new. A lifetime spent listening to music has left him jaded, fearful that all music has been reduced to 'a matter of power relations, nationalism, market forces, class contestation, and identity politics' (2008: 90). In a complicated double bind, the antidote to Steiner's musical malaise reaches him via its distribution as a format which is itself beset with political resonance. As Sterne acknowledges, the MP3 'originated as an attempt to solve the problem of exchangeable formats across segments of the media industry' and quickly became embroiled in 'major international controversy over the status of intellectual property, copyright and the economics of entertainment' (Sterne 2006: 825). That being said, the viral piece of music is described in a way that suggests it is the product of the MP3's hyper-fertile musical cross-pollination. The song is simultaneously 'the tune your immigrant nanny made you laugh with, the unsuspecting needle dropping onto a virgin *Sgt. Pepper*, a call to desert prayer' and 'the last four measures of something amazing on the radio that you could never subsequently identify' (Powers 2008: 101). At least '[t]hat's how the world described it the next day, those who were lucky enough not to rip their buds out of their ears or fiddle with their rebellious players' (2008: 101-102). The recording epitomizes an idealized hybrid musical form. It is the product of a hypothetical listening subject who has delved deep into the near-bottomless musical melting pot cooked up by online file sharing. The song's anonymous auteur is a conjectural point of consciousness through which the totality of recorded music has been processed; the song itself is the crystalized codification of these sounds into a single paradigmatic file.

'Modulation' addresses how the insatiable pursuit of new music as a commodity only breeds further dissatisfaction. That so much music is so readily available to the short story's characters compounds their eagerness to hear something different, until the viral MP3 puts an end to their search for perfection. A small number of the people who hear the perplexing recording are in attendance at the Sydney 8-Bit Chiptune Blowout, where fans of retro video game music congregate to hear their favourite tunes re-imagined into dance-friendly remixes. Mitchell Payne is one of the performers. He is a 'leading Futurepop composer and perhaps the greatest real-time Roland MC-909 Groovebox performer of his generation' (2008: 91). The conjunction of the sample-heavy genre Futurepop and Roland's hardware sampler-sequencer timestamps 'Modulation' in mid-2000s digital music culture. Futurepop is an amalgam of grandiose industrial synthesized sounds and alternative rock vocal stylings that typifies the coining of untold generic neologisms during this period. Payne boards the flight that will take him to Australia with a hard drive full of music. He is '[a]rmed with amazing new ways to write, arrange, record, and perform', just as Steiner predicted of digitalization's influence on music, '[b]ack in the 1970s' (2008: 97). Unlike for the young Steiner, though, imagining music's utopian future, that '[m]ore music of more variety was [now] being produced by more people' is a cause for concern for Payne (2008: 97). Such a profusion is due in part to the effects of music's micromaterialization, particularly the ease of their exchange and affordability of their storage owing to data compression.

A limitless musical expanse stretches ahead of Steiner and Payne, and plenty gives way to atrophy. The language that focalizes Steiner's experience of listening to music in the age of its data-compressed reproduction is tinged with elegy and loss. Powers's narrator posits that such endlessly generative creativity has resulted in more music 'than any ethnomusicologist would ever be able to name again' (2008: 97). The adverbs 'ever' and 'again' communicate Steiner's longing to return to a time when he felt music was knowable. And indeed, despite his very different expertise, Payne has recently 'scored only seventy-two percent on an online musical genre test' (2008: 91). He fears that 'he no longer had his finger on the pulse' at age twenty-three; that 'things were happening, whole new genres crossbreeding, and he was going to be one of those people who didn't even hear it until the next big thing was already in its grave and all over the cover of *Rolling Stone*' (2008: 92). 'Modulation', then, ponders the implications of the MP3 as a catalyst for new musical expression. Powers credits the MP3 for its role in spawning and popularizing infinite iterations of sub-genre after sub-genre – 'epic house, progressive house, filtered house and French house'; 'acid groove, acid croft, acid techno and acid lounge' – particularly among music fans for whom recorded music has never been a physical medium, beyond the 'accessory hardware' needed to stream or download music from the internet (Powers 2008: 91-92; Devine 2019: 135-146). The MP3 as a compressed representational mode offers affordances, owing to its size, that establish endless and infinite proliferations in meaning.

Steiner and Payne are two characters at opposite ends of their careers in music and for whom listening is a disquieting and disorientating practice. Payne weaponizes his collection into an assault against the threat of irrelevance, within a scene that fetishizes innovation even as it plunders the past for source material. He arrives in Sydney 'armed' (Powers 2008: 97), prepared to fight to reposition his 'finger' on the 'pulse' of music's beating heart (2008: 92). All the while, he is fearful that his compositions will go the way of countless before them, consigned to their 'grave' to decompose (2008: 92). 'Modulation' ends as Steiner's heart stops. He slips and falls during heavy snow that envelops the college campus, shattering his phone into 'little Lego pieces' (2008: 103). As he dies, Steiner attempts to coax the device back to life, so that it might provide 'a diverting tune' while he is 'waiting to go numb' (2008: 103). In the story's final moments, language of militarized violence and elegiac wistfulness is replaced by renewed optimism: 'Through the dead buds, he hears the crushed device whisper a vast and silent fantasia: the wired world recovering a theme it long ago misplaced' (2008: 103). It is in music's sudden absence, not its ubiquitous presence, that Steiner is reminded of music's status as a 'fundamental human pleasure' (2008: 103). Conflict subsides, and comfort appears in its place; hurt modulates into healing.

'Modulation' chronicles its characters as they chart a course through music's micromaterialization. Their path is beset with questions of value and the ethics of consumption in a model where data compression has enabled music's exchange without money changing hands. Since the short story's publication over ten years ago, these questions have only become more pertinent, as subscription streaming services like Spotify and Apple Music have once again revolutionized how people listen to music.

### **'Spine-crushing stuff': Compression as Aggression in 'Modulation'**

'Modulation' is a response to the effects on music when the MP3 is the technology that contains and reproduces it. The story establishes the related processes of compression as an interpretive guide in its very first sentence:

From everything that Toshi Yukawa could later determine, the original file was uploaded to one of those illegal Brigadoon sites that appeared, drew several thousand ecstatic hits from six continents, then disappeared traceless, twelve hours later, compressing the whole arc of human history into a single day (Powers 2008: 87)

Data compression is vital to how the virus begins to spread, because compressed music files are ‘easier to exchange in a limited bandwidth environment such as the internet’ (Sterne 2006: 828). Sterne cites another form of compression in its ‘general history’, a history to which the MP3 belongs (Sterne 2012: 5): dynamic range compression lessens the difference between quiet and loud in recorded music, which results in an increase in the recording’s perceived loudness or intensity. In order to bring up the overall level of a song, drastic dynamic range compression eschews musical subtleties. Compression sacrifices detail in favour of an intense, unabating wall of sound when applied to a recording indiscriminately.

‘Modulation’ captures the violent loudness of an over-compressed MP3 when, on the second page of Powers’s story, we are introduced to the Brazilian journalist Marta Mota, who has been sent to Diyala to write about conflict in the province during the Iraq War. Just before she leaves, Marta interviews a member of the United States Infantry, a man who goes by the moniker Jukebox. He tells Marta how ‘part of his informal job description involved rigging up one of the M1127 Stryker Reconnaissance vehicles with powerful mounted speakers, in order to pound out morale-boosting music for the unit during operations’ (Powers 2008: 88). Powers leaves us to speculate as to the songs that might have made it onto a playlist compiled for this purpose, despite Marta’s inquiries:

She asked what music the Stryker vehicle pumped out, and Jukebox gave a rapid-fire list: the soundtrack of the globe’s inescapable future. She asked for a listen. He pulled out something that looked like those slender, luxury matchboxes set out on the tables in her favorite Vila Madalena jazz club. She inserted the ear buds and he fired up the player. She yanked the buds out of her ear, howling in pain. Jukebox just laughed and adjusted her volume. Even at almost mute, the music was ear-stabbing, brain-bleeding, spine-crushing stuff. (Powers 2008: 88)

The triumvirate of present participle adjectives in the final sentence above communicates the violence to which I am referring. In *Sound Targets: American Soldiers and Music in the Iraq War* (2009), Jonathan Pieslak provides a detailed account of how – and why – US service personnel used music during the Iraq War. A number of his interviewees identified one song that was especially popular among several battalions: ‘Bodies’ by Drowning Pool, a fairly pedestrian example of the nu-metal genre, which had its brief heyday in the early 2000s. The song has had its dynamic range dramatically compressed, so that there is very little respite in the intensity of its level. Once the song explodes into life after a relatively quiet introduction, it progresses as a series of unrelenting peaks, besides a few scarcely noticeable sections of reprieve. It is practically impossible to play the song back at a low volume. The entire recording hovers around the maximum values before digital sound begins to distort. One can only speculate as to whether Jukebox’s morale-boosting playlist contains ‘Bodies’. In any case, Pieslak’s research into the song’s popularity among US soldiers certainly suggests it fits the bill, making it as likely a candidate as any. Further clues lurk in Powers’s story, as it narrates that ‘even at almost mute’, the music that Jukebox played for Marta ‘was ear-stabbing, brain-bleeding, spine-crushing stuff’ (2008: 88), not simply loud but violently so. A song like

‘Bodies’ would sound loud regardless of its playback volume. The music in this scene from ‘Modulation’ has been subjected to comparable dynamic range compression. Like Drowning Pool’s number, it is loud, whether Marta wants it to be or not; the music has its intensity built into its form – it is compression as aggression.

Dynamic range compression serves a valuable purpose, because of how MP3s are commonly consumed. MP3s are portable, and so people often have to combat the background noise one experiences when listening to music while driving, jogging or working in a shared office space. Music is first and foremost a ‘data structure’ in the ‘information age’, and its ‘pre-eminent medium’ is the MP3 (Powers 2000a: 15). The container technology of the MP3 format has altered the sound and application of the recordings they contain. Faithful reproduction was once prized above all else, never more so than during the high-fidelity craze that swept 1950s suburban America. From the domesticity of the front room to the battlefield of Diyala, however, function has superseded fidelity as the organising principle behind the preferred representational mode. Jukebox’s troubling use of the MP3 is a sinister example of what Powers identifies as the ‘changing nature of the use of music as a cultural commodity’ (McCracken 2014: n.pag.). Jukebox has repurposed the container technology into an agent of war; the fandom of Jan Steiner and Mitchell Payne has descended into something closer to fanaticism. As with the violent language the narrative adopts elsewhere in the short story, Powers invites a reading of compressed representation as a potentially aggressive affront to that which it represents.

### **Short story form as compressed representational mode**

It is reasonable to assume that the short story form might yield when faced with representing something as monolithic and nebulous as the information age. To tackle the global dispersion of informational glut with a knowingly economized narrative form could be seen as counterintuitive or self-defeating. This, one might argue, is rather the remit of Powers’ hefty ‘novel[s] of information’, working in the tradition of William Gaddis and Thomas Pynchon (Burn 2008a: 171-174). However, in ‘Modulation’, Powers uses the short story form to detail the MP3’s impact on cultures of listening and musical production. In so doing he succeeds in ‘reflect[ing] the explosion of data that typifies life in the information age’ (Burn 2008a: 173-174). The short story form, like the MP3 format and other digital data, is predicated on elimination: of ‘all intermediary ideas or situations’, as Charles E. May puts it (1994: xvii); or of ‘everything which does not bear directly upon the action’, according to Julio Cortázar (1994: 251). The latter goes on to describe ‘the extraordinary aspect’ of ‘sweeping omission’ that characterizes the short story form (1994: 251). As a consequence of their mutual compression, the ‘data structure’ of the short story is singularly suited to narrate the ‘data structure’ of the MP3 (Powers 2000a: 15). Renewed academic interest in the genre has left the idea of compression and the short story relatively untouched since May used the term in his introduction to *The New Short Story Theories*.<sup>4</sup> Powers’s astute commentary in ‘Modulation’ on compression and the MP3 is what prompts me to revisit it here.

There is a case to be made for thinking of the short story as an equivalent to a compressed recording. Dynamic range compression eliminates all but the most essential psychoacoustic details of a recording in the name of intensity of effect; the short story has been theorized using similar terms. May proposed that the short story’s “‘intensity” results instead from the elimination of all intermediary ideas or situations’ (1994: xvii). Data compression and dynamic range compression, as indicated above, eliminate the intermediary from digital sound. What remains is a recording reduced to its ‘centralization of basic effect’ (Éxjenbaum 1994: 87). Boris Éxjenbaum uses this phrase to describe the short story form, but it could equally

apply to the MP3. It is not surprising, therefore, that form and format also overlap in other ways. May adds that ‘a number of short-story writers and critics have commented on the implications of shortness, compression and intensity for a story’s thematic significance’ (1994: xvii). Norman Friedman is one such critic, having written that a story is short for either one or both of two familiar yet fundamental reasons: ‘the material itself may be of small compass; or, the material, being of broader scope may be cut for the sake of maximising the artistic effect’ (1958: 105). He makes a distinction between ‘object’ of representation on the one hand, or *what* a story represents; and ‘manner’ of representation on the other, or *how* a story represents its action (1958: 105). These are the two key elements of structuralist narratology and have variously been referred to as ‘story’ and ‘discourse’, ‘*fabula*’ and ‘*siuzhet*’, and ‘deep structure’ and ‘surface structure’ (Culler [1981] 2001; Tomashevsky 1965; Chatman 1975). Friedman’s point is that much of the short story’s artistry is derived from how authors take an information-rich object of representation – or story or *fabula*; its deep structure – and ‘cut’ away at it, leaving a manner of representation – the story’s discourse, *siuzhet* or surface structure – that serves to exalt brevity as an aesthetic practice (Winther et al. 2004).

The short story form and the MP3 format both favour omission over ornamentation, refinement over redundancy, ‘small’ over ‘big’. The last of these sets of oppositions is taken from Éxjenbaum, who observes that the difference between the novel and the short story is a ‘fundamental distinction between big and small form’ (1994: 81). The same could be said of what distinguishes uncompressed digital audio from the MP3. In *MP3: The Meaning of a Format* (2012), meanwhile, Sterne emphasizes that ‘[t]he history of MP3 belongs to a *general history of compression*’ (Sterne 2012: 5, original emphasis). ‘Modulation’ is a short story with a sizeable object of representation and a compressed manner of representation. The story’s four narrative strands and varied international settings could hardly be described as ‘small compass’, seeing as how Powers charts the story’s action across distant co-ordinates (Friedman 1958: 105). Powers’s story, instead, falls into the second of Friedman’s categories. Friedman’s first story type explains that ‘[a] short story may be short [...] because its action is inherently small’ (1958: 112). ‘Modulation’, however, ‘encompass[es] a larger action’ than stories of this sort, but it is still – nevertheless – ‘short’ (1958: 112). Powers omits and leaves a great deal to inference; by this reckoning, there is a significant amount of story that escapes representation as discourse.

For the MP3, compression is a largely functional process, devoid of any of the artistry that Friedman and Winther et al. associate with the short story form. The MP3 is designed to allow digital music files to enter into a specific set of relations in circumstances some of which Powers’s story details, as developed earlier in this article. Sterne writes that ‘an MP3 takes an existing CD-quality digital audio file and removes as much data content as possible, relying on listeners’ bodies and brains to make up the difference’ (2006: 832). The MP3 offers ‘a fraction of the information’ of the original recording and allows ‘listeners’ bodies to do the rest of the work’ (2006: 835). This resembles what Friedman suggests about short stories, in that readers of short fiction are left to infer material that short narratives omit from what he calls the ‘whole action’ (1958: 112). If the MP3 is a machine that listens for its listeners, then the short story is a container technology similar in kind. Container technologies transform the contents of that which they hold. As means of storage or containment, for audio recordings and narrative respectively, the MP3 and the short story share a relationship with larger versions of themselves, versions that exist prior to and remain separate from the compressed forms into which they become manifest. The MP3 format transforms ‘existing CD-quality digital audio’ into a file size up to one tenth as large (Sterne 2006: 832); the short story compresses the ‘whole action’ of a narrative – its deep structure or *fabula* – into a surface structure or *siuzhet* suitably short in length (Friedman 1958: 112). In both cases, the compressed representational modes leave only the most essential information.

There is disagreement among narratologists as to whether every narrative possesses a basic story – a deep structure – that is ‘independent of any surface manifestation or expression in any material form, mode, or medium’ (Smith 1980: 216). In this theory, a basic story structure ‘may be transposed from one to another medium without losing its essential properties’ (Bremond, quoted in Chatman 1978: 20). Smith disputes the notion of an abstract deep structure that can be isolated from a story’s telling (1980: 214). Rather, she contends that each and every telling is its own version constructed ‘by someone in particular, on some occasion, for some purpose, and in accord with some relevant set of principles’ (1980: 218). The alternative theory is one of ‘narrative versions’, and this has implications for the equivalence I have drawn between uncompressed digital audio and deep structure (1980: 215). In reality, uncompressed audio is no less a version than its compressed counterpart. Just as for Smith there is no originating narratological deep structure – only distinct narrative instances – there is no original sound, at least not one that can reasonably be presumed to exist within the ‘process of reproduction’ (Sterne 2006: 836-837). Even the most high-fidelity recording is already a version, as it will not capture all of the acoustic information that it subsequently alleges to reproduce.

The usefulness behind thinking of both narrative and audio in terms of versions is that it encourages categorization according to function and intention. Theorists of narrative or media can then read into the significances that reveal themselves in these differences in length, type or size between versions. Smith explains narrative versions more fully: ‘the form and features of any version of a narrative will be a function of, among other things, the particular motives that elicited it and the particular interests and functions it was designed to serve’ (1980: 221). In their forms alone, the compressed representational modes of the short story and the MP3 reflect patterns of production and consumption that favour information that exists as smaller ‘data structures’ or that shun surplus detail (Powers 2000a: 15). Smith continues:

Whenever we start to cut back, peel off, strip away, lay bare, and so forth, we always do so in accord with certain assumptions and purposes which, in turn, create hierarchies of relevance and centrality; and it is in terms of these hierarchies that we will distinguish certain elements and relations as being central or peripheral, more important or less important, and more basic or less basic. (1980: 221)

Each of the phrasal verbs Smith uses above – to ‘cut back’, ‘peel off’, ‘strip away’ and ‘lay bare’ – alludes to refinement and omission as integral processes in the production of context-dependent narrative versions. Compression is also behind the listening contexts that Powers narrates in ‘Modulation’. Powers succeeds in reflecting the ‘data structure’ as the ‘pre-eminent medium of the age’ (Powers 2000a: 15), not only for music, but all media and communication. ‘Modulation’ is a formal iteration of the data compression it narrates; thus, I have argued, the short story enters into ‘ways of thinking about the world that are ordinarily left to nonfiction’ (Peters 2013: n.pag.). Powers’s philosophy of the novel, then, can accommodate the short story form as a philosophy of fiction more generally.

## **Conclusion**

Though the MP3 is maligned by some as a debased container technology for low-fidelity reproductions, the format’s proliferation in the first decade of the twenty-first century has formed new social and material relations between music and its listeners. As Sterne sets out,

the MP3 is therefore a ‘cultural artifact’ that warrants our attention as such (Sterne 2006: 825). I have argued that there is an instructive degree of overlap between short story theory and how media scholars have conceived of the MP3. The short story also faces similar accusations as the MP3 concerning the consequences of its compression. Indeed, Friedman notes that the short story is ‘tainted by commercialism and damned by condescension’ (1958: 103); the MP3 is often blighted by comparable charges against its convenience and commodification.

Powers has spoken candidly about information’s importance to his work. He puts great stock in the potential for excess to become its opposite. In other words, Powers’s novels of information operate on the assumption that the complex stitching together of seemingly disparate threads can reveal something approximating the patterns of existence; or rather a version of these patterns small enough to be seen as a whole, but still big enough to hint at their vastness. In contrast to Powers’s novels of information, ‘Modulation’ is a short story about an audio format that proclaims the advantages of less. Burn argues that Powers ‘sees data (and particularly scientific data) as an irrefutable aspect of contemporary existence that must be acknowledged by the modern novel’ (Burn 2010: 164). Powers has ratified this reading of his work, insisting that the “‘information novel’” shouldn’t be a curiosity, but rather it should be ‘absolutely mainstream’ (Bloom 2000: n.pag.). There remains an obvious point to be made: ‘Modulation’ is not a novel of information. It is not a novel at all, but a short story. And this is precisely why it is the more appropriate form to tell Powers’s story. The short story form is a manner of representation that has ‘omission’ and ‘elimination’ built into it (Cortázar 1994: 251; May 1994: xvii). ‘Modulation’ approximates a form that we might call the short story of information.

## References:

- Attali, Jacques ([1977] 1985), *Noise: The Political Economy of Music*, Minneapolis: The University of Minnesota Press.
- Bloom, Harvey (2000), ‘Two geeks on their way to Byzantium’, *The Atlantic*, 28 June, <https://www.theatlantic.com/past/docs/unbound/interviews/ba2000-06-28.htm>, Accessed 14 May 2020.
- Bremond, Claude (1964), ‘Le message narrative’, *Communications*, 4: 1, pp. 4-32.
- Burn, Stephen J. (2008a), ‘An interview with Richard Powers’, *Contemporary Literature*, 49: 2, pp. 163-179.
- Burn, Stephen J. (2008b), ‘Preface’, in S. J. Burn and P. Dempsey (eds), *Intersections: Essays on Richard Powers*, Champaign and London: Dalkey Archive Press, pp. xi-xv.
- Burn, Stephen J. (2010), ‘After Gaddis: data storage and the novel’, in C. Alberts, C. Leise and B. Vanwesenbeeck (eds), *William Gaddis, ‘The Last of Something’: Critical Essays*, Jefferson: McFarland & Co., pp. 160-170.
- Chatman, Seymour (1975), ‘Towards a theory of narrative’, *New Literary History: A Journal of Theory and Interpretation*, 6: 2, pp. 295-318.

- Chatman, Seymour (1978), *Story and Discourse: Narrative Structure in Fiction and Film*, Ithaca and London: Cornell University Press.
- Cortázar, Julio (1994), 'Some aspects of the short story', in C. E. May (ed.), *The New Short Story Theories*, Athens: Ohio University Press, pp. 245-255.
- Culler, Jonathan ([1981] 2001), 'Story and discourse in the analysis of narrative', in *The Pursuit of Signs: Semiotics, Literature, Deconstruction*, New York: Cornell University Press, pp. 188-208.
- Drowning Pool (2001), 'Bodies', *Sinner*, New York: Wind-up Records.
- Éxjenbaum, Boris (1994), 'O. Henry and the theory of the short story', in C. E. May (ed.), *The New Short Story Theories*, Athens: Ohio University Press, pp. 81-89.
- Friedman, Norman (1958), 'What makes a short story short?', *Modern Fiction Studies*, 4: 2, pp. 103-117.
- Herrnstein Smith, Barbara (1980), 'Narrative versions, narrative theories', *Critical Inquiry*, 7: 1, pp. 213-236.
- Ibáñez, J. R., Francisco Fernández, J. and Bretones, C. M. (eds) (2007), *Contemporary Debates on the Short Story*, Bern: Peter Lang.
- Iftekharruddin, F., Boyden, J., Longo, J., and Rohrberger, M. (eds) (2003), *Postmodern Approaches to the Short Story*, Westport: Praeger.
- May, Charles E. (1994), 'Introduction', in C. E. May (ed.), *The New Short Story Theories*, Athens: Ohio University Press, pp. xv-xvii.
- McCracken, Keenan (2014), 'A conversation with Richard Powers', *Music & Literature*, <http://www.musicandliterature.org/features/2014/9/4/a-conversation-with-richard-powers>, Accessed July 26 2019.
- Milner, Greg (2009), *Perfecting Sound Forever: The Story of Recorded Music*, London: Granta.
- Monforte, John (1984), 'The digital reproduction of sound', *Scientific American*, 251: 6, pp. 78-85.
- Petermann, Emily (2014), *The Musical Novel: Imitation of Musical Structure, Performance and Reception in Contemporary Fiction*, Rochester: Camden House.
- Petermann, Emily (2017), 'New modes of listening: the mediality of musical novels', *Partial Answers: Journal of Literature and the History of Ideas*, 15: 1, pp. 69-79.
- Peters, Tim (2013), "'Wonderfully strange" world of Richard Powers', *Publishers Weekly*, <https://www.publishersweekly.com/pw/by-topic/authors/profiles/article/60308-wonderfully-strange-world-of-richard-powers.html>, Accessed May 21 2020.

- Pieslak, Jonathan (2009), *Sound Targets: American Soldiers and Music in the Iraq War*, Bloomington: Indiana University Press.
- Powers, Richard ([1985] 2010), *Three Farmers on Their Way to a Dance*, London: Atlantic Books.
- Powers, Richard ([1991] 1993), *The Gold Bug Variations*, New York: Harper Collins.
- Powers, Richard ([1995] 2010), *Galatea 2.2*, London: Atlantic Books.
- Powers, Richard (2000a), 'Being and seeming: the technology of representation', *Context: A Forum for Literary Arts and Culture*, 3, pp. 15-17.
- Powers, Richard ([2000] 2002), *Plowing the Dark*, London: Vintage.
- Powers, Richard ([2002] 2003), *The Time of Our Singing*, London: Vintage.
- Powers, Richard ([2006] 2007), *The Echo Maker*, London: Vintage.
- Powers, Richard (2008), 'Modulation', *Conjunctions*, 50, pp. 87-103.
- Powers, Richard (2009), *Generosity: An Enhancement*, New York: Farrar, Straus and Giroux.
- Powers, Richard (2014), *Orfeo*, London: Atlantic Books.
- Powers, Richard (2018), *The Overstory*, London: William Heinemann.
- Reichel, A. Elisabeth (2014), 'Fictionalising music/musicalising fiction: the integrative function of music in Richard Powers' *The Time of Our Singing*', *Sound Effects*, 4: 1, pp. 144-160.
- Reichel, A. Elisabeth (2017), 'Musical macrostructures in *The Gold Bug Variations* and *Orfeo* by Richard Powers; or, toward a media-conscious audionarratology', *Partial Answers: Journal of Literature and the History of Ideas*, 15: 1, pp. 81-98.
- Lojo Rodríguez, Laura Maria (2013), 'Short Story Theories: A Twenty-First Century Perspective by Viorica Patea (ed.)', review, *Atlantis: Journal of the Spanish Association of Anglo-American Studies*, 35:3, pp.195-201.
- Sofia, Zoë (2000), 'Container technologies', *Hyptapia*, 15: 2, pp. 181-201.
- Sterne, Jonathan (2006), 'The mp3 as cultural artifact', *New Media & Society*, 8: 5, pp. 825-842.
- Sterne, Jonathan (2012), *MP3: The Meaning of a Format*, Durham, North Carolina: Duke University Press.
- Tomashevsky, Boris (1965), 'Thematics', in T.T. Lemon and M. J. R. Reis (eds), *Russian Formalist Criticism: Four Essays*, Lincoln: The University of Nebraska Press, pp. 61-95.

Winther, P., Lothe, J. and Skei, H.H. (eds) (2004), *The Art of Brevity: Excursions in Short Fiction Theory and Analysis*, Columbia: University of South Carolina Press.

---

<sup>1</sup> It is for this reason that Powers's musical novels often feature prominently in studies of the musical novel as a distinct category of fiction (Petermann 2014, 2017; Reichel 2014, 2017).

<sup>2</sup> For more on exchange, use and the musical commodity, see Attali ([1977] 1985).

<sup>3</sup> Sterne (2006) provides an accessible introduction to the mechanics of the MP3, as well as a concise history and explanation of its development. For a thorough overview of digital audio in general, I recommend Milner (2009: 224-288) and Monforte (1984).

<sup>4</sup> A number of publications since 2000 have sort a departure in short story theory from 'the valuable contributions' of May, Éxjenbaum and Cortázar (Lojo Rodríguez 2014: 195). These include Iftekharuddin et al. (2003), Winther and Skei (2004) and Ibáñez et al. (2007).