

RICHARD OSBORNE, 'INTRODUCTION'

Music resides in numbers. In his original proposal for this collection, Dave Laing noted how 'from the music of the spheres deduced by Pythagoras to the cataloguing of works by classical composers, music and mathematics have for centuries been intimately connected'. These mathematical reckonings form the very basis of music: its pitches; its harmonic structures; its rhythmic divisions. They also accrue to the work itself.

'Number' has been a term for a piece of music since the late nineteenth century at least ('number, n.' *OED* 1989). This practice is derived from listing, whether that be the ordering of songs in a Hawker's collection, the division of parts in an opera or oratorio, or the sequential matrix and catalogue numbers that have been applied to recordings. The items in a programme of live music became known as 'numbers', a term that became most fully institutionalized in the world of jazz. The *Publication of the American Dialect Society* noted in 1958 that the habit of referring to any tune as a 'number' was 'deeply engrained in the speech of the jazzman' (*ibid.*). As with many aspects of jazz, this custom was carried over into rock music. The Doors' recording 'The Soft Parade' provides one example. As the song unfurls, Jim Morrison declares that he is 'proud to be a part of this number' (The Doors 1969).

But would he be proud to be part of a statistic? Here music's connection with numbers can be more disconcerting. The mathematical formulas that underpin the creation of music do not diminish its wonder, but statistical reckoning can bring it crashing down to earth. Most pointedly, 'the collection or arrangement of numerical facts or data' only comes to be applied to cultural forms in the process of their industrialization ('statistics, n.' *OED* 1989). Statistics are an economic by-product of the mass manufacture and technological mediation of art.

It has been possible to view this industrialization in a positive light. In his pioneering 1935 article, 'The Work of Art in the Age of Mechanical Reproduction', Walter Benjamin suggested that the duplication of cultural products would lead to a 'tremendous shattering of tradition' and would emancipate works of art from their 'parasitical dependence on ritual' ([1935] 1999: 215, 218). This was on the basis that, 'in permitting the reproduction to meet the beholder or listener in his own particular situation, it [mechanical reproduction] reactivates the object reproduced' (ibid.: 215). At his most optimistic, Benjamin claimed that 'Quantity has been transmuted into quality. The greatly increased mass of participants has produced a change in the mode of participation' (ibid.: 232).

More commonly, the prognosis has been gloomy. In his 1977 book *Noise*, Jacques Attali introduced an economic analysis that was absent from Benjamin's work. He regarded the mechanization of art as ushering in an era of isolated 'repetition' in which 'each spectator has a solitary relation with a material object' ([1977] 1985: 32). He did not view this as being liberating. Attali claimed instead that 'with all mass production, security takes precedence over freedom; one knows nothing will happen because the entire future is already laid out in advance' (ibid.: 121). The overturning of ritual is not a good thing. The 'opportunity for spectators to meet and communicate' has been replaced with the 'mass production of all social relations' and 'individualized stockpiling [...] on a huge scale' (ibid.: 32). The economic valuation of art is additionally transformed. The cost of each item 'bears no direct relation to the production price, to the quality, properly speaking'; all works are instead priced in an 'approximately equal' manner (ibid.: 101). Put another way, there are 'High fixed costs of production [...] and low to zero marginal costs of reproduction and distribution' (Garnham 2005: 19). As a

result, it is the volume of sales that matters. Attali suggests that it is inevitable that a 'statistical evaluation' of quantity will take hold ([1977] 1985: 84).

Music is not alone in engaging with these numbers. Other industrialized artworlds have a statistical bent. In this respect, the music business has most in common with the book trade (which employs similar methods of duplicative publication) and with cinema (which has some parallel divisions of labour in its studio productions). It is also with these forms that it is most closely related in copyright law. Music publishing owes its original copyright protection to the fact that scores can be read like books; the ownership of copyright in sound recordings is treated similarly to films. Yet in all instances the music business appears to take the statistical imperative further than its creative neighbours. Its engagement with these numbers is more widespread, more public and more profound.

Take 'hit parades', for example (ibid. 1985: 107). Attali viewed these popularity charts as a means by which the statistical evaluation of the cultural industries would be made manifest; it is because of the 'identically priced objects that are flooding our lives' that we are in need of a 'ranking scheme exterior to their production' (ibid.: 107, 108). These charts have a disorientating effect on the dispersal of culture. Trade becomes concentrated on a limited number of titles, while the top few items in the charts receive more exposure and exponentially more sales than those listed below. Charts have helped to engender 'winner take all' markets (Frank and Cook 2010), as well as statistical initiatives to correct their pull.

As Attali notes, 'It is clear that the hit parade is not unique to music' ([1977] 1985: 108). The film industry was an early adopter of such charts: its box office returns have been tallied since the early twentieth century. This precedes charts for book sales, which have existed in the United States since the 1930s, and in Britain since 1974. It is

within music, however, that popularity charts have had their greatest resonance. The earliest of them concerned sales of sheet music and can be traced back as far as the second half of the nineteenth century (Strachan and Leonard 2003: 536). Next came charts that detailed the most popular songs on radio and the most played jukebox hits, both of which were initiated in the US in the 1930s (ibid.). Charts for record sales were established in the US by *Billboard* in 1940, and in Britain by the *New Musical Express* in 1952. As well as being central to the music business, these charts have shaped the actions of those who mediate songs and records. Radio formats, television programmes, music magazines and retail outlets have each been structured in accordance with the top 40 hit records. To counteract this blockbuster environment, attempts have been made to promote a broader representation of culture by regulatory and philanthropic means. Quotas have been imposed on broadcasters to ensure greater generic representation; funding has been provided to aid economically imperilled forms.

The mass reproduction of culture has another evaluative consequence: payments 'are proportional [to the] number of copies sold' (Attali [1977] 1985: 99). The move to royalty payment systems happened quickly for publishers and manufacturers of mechanical works, while creators of content usually lagged behind. For example, the Gutenberg Press was developed in the 1430s, but it would be the late nineteenth century before royalties became common for the writers of books (Caves 2000: 59). Sheet music was regularly produced on printing presses by the eighteenth century, but the majority of composers and songwriters did not receive royalties until the 1920s and 1930s (Towse 2015: 8). It was in the same inter-war period that actors began receiving royalties for films, despite the medium being developed in the 1890s (Ravid 2005: 46). Sound recording was invented in 1877, but royalties were not widespread for recording artists until the mid-twentieth century, or for studio personnel until the 1960s

(Martland 2013: 308; Rye 2017: 110). From the creators' point of view, the demand for this form of payment has represented a cause for justice. Rather than receiving set fees or patronage, many of them have preferred to be paid in accordance with the successes of their works.

This move has nevertheless led to an increasingly bureaucratic environment where accounting is continuous and there are complex procedures to ensure that payments take place. Artists negotiate payment points with the companies they are contracted to, as well as agreements about advances, recoupments, reductions and deductions. The companies negotiate deals with the sellers of the products, arriving at wholesale rates and recommended retail prices. There is a need to provide tallies of each item manufactured, distributed and sold. Moreover, under the 'capitalism of mass production' the 'statistical evaluation' of art comes to be applied more widely (Attali [1977] 1985: 84). The royalty system does not only adhere to the retail of duplicated goods; it is also utilized for performance and broadcast rights. These rights have an insatiable appetite for data. They expand outwards: there are always more performances and broadcasts to monitor. They also expand inwards: there is a gravitational pull towards providing ever finer detail about the works used and the interested parties involved. Collection societies are created in their honour; organizations that are devoted to the statistical administration of art. Attali believed that their task is ultimately Sisyphean in nature, suggesting that 'It is conceivable that, at the end of the evolution currently under way, locating the labor of recording will have become so difficult, owing to the multiplicity of the forms it can take, that authors' compensation will no longer be possible except at a fixed rate, on a statistical and anonymous basis independent of the success of the work itself' (ibid.: 100).

Royalty administration still continues, nonetheless, and the music business pursues it further than any of its culture industry partners. This is, in part, because of the large number of participants involved. Whereas a book commonly has a single author, there are multiple creators of a successful piece of music: writers, publishers, musicians, record companies and studio personnel all compete over royalty splits. Meanwhile, although a film will have an even broader array of participants, only a limited number of them will be on royalty-based payments. In addition, the deployment of both books and films is narrower than that of music. Book publishing is generally limited to the reproduction and adaptation of works. The film industry is more diverse. As well as its box office returns, there are television broadcasts and the retail of videos, DVDs and other audio-visual formats to recompense. This activity pales in comparison with the music industry, however. In fact, as John Williamson and Martin Cloonan have pointed out, there is not one industry, there are separate music 'industries' (2007). Until the mid-twentieth century, music publishing was the sector that was most economically prosperous. It was originally focused on the duplication of sheet music, but by this period was prioritizing other forms of revenue, including synchronization fees for matching images with sounds and the various rights that are administered by collection societies: the mechanical rights concerning the use of compositions in a variety of different reproductive formats; the performance rights for the use of music in numerous public settings; and the broadcast rights for the licensing of songs to radio and television. Music publishing was overtaken economically by the recorded music industry, the trade that is at the heart of Attali's analysis. It should nevertheless be

noted that as recorded music forged ahead, it too was broadening its economic base to include public performance rights, broadcast rights and sync fees.¹

The royalty-paying culture industries document their economic activities in two main ways. On the one hand, there is their accounting to their artists, where each use of a work and each division of rights is outlined in some detail. On the other hand, there are their public-facing statistical yearbooks. Here, they delineate the monies generated by each of their revenue streams, but they do not disclose the division of these spoils between the various parties involved. It is also usually only collection societies who provide accounts of their operating costs. As a result it is hard for artists to use this reporting data to measure the equitability of their pay.²

The publication of reports is another practice that is most extensive in the music industries. There are the figures collated by umbrella groups for the industries, such as

¹ Although the percentage splits for synchronisation licences are contractually agreed, each licence is negotiated competitively in the market rather than being set by pre-agreed terms. Licensor and licensee arrive at a one-off fee rather than a repetitive rate that will devolve into royalties. A similar process takes place for the sound recording copyright element of sample clearance and for the broader licensing of recordings between audio companies. As such, the recording and music publishing industries have a number of revenue streams, some of which are bargained over and some of which are determined on the basis of statistical formulae.

² An exception was provided by the early yearbooks issued by the British Phonographic Industry (BPI). Between 1977 and 1990 they provided a 'cost breakdown' based on the retail price of physical formats. Some of the results were dubious. In 1977, for example, the BPI was suggesting that for every full price (£3.25) album sold in the previous year, recording artists were making 42 pence per copy, while record companies were only making three pence profit (Hunter 1977: 147). This would work out at pre-tax profits of less than one per cent of sales revenue for the record companies, but later reports suggested that their pre-tax profits in 1976 were thirteen per cent of sales revenue (Scaping 1986: 32). BPI came to acknowledge the variability of the figures: by 1979 they were providing the caveat that 'The costs associated with any new release are different in virtually every case' (Scaping 1979: 127). Moreover, given the inconsistency in artist royalty rates, which 'naturally vary' (ibid.), it is perhaps not surprising that the BPI eventually decided to withhold their information about costs.

UK Music's annual *Measuring Music* reports.³ There are the national yearbooks of the recording industries and the *Global Music Report* produced by its International Federation of the Phonographic Industries (IFPI). There are the figures issued by each of the performing right societies, as well as the annual accounting of the International Confederation of Societies of Authors and Composers (CISAC). There are also the various documents produced by management forums, musicians' unions and other organizations for performers, songwriters and publishers, as well as the statistics that are compiled by the mediators of music. None of these are neutral and nor do they pretend to be. They are each accompanied by commentaries that announce the organizations' interests and campaigns.

Some of these campaigns take the forms of internal battles. The various sectors of the music industries have employed statistics against one another, as well as against their mediators, as they have fought competitively in the market to secure their interests. This practice goes back as far as the early twentieth century, when music publishers accused record companies of being pirates because they were not paying them royalties for their use of compositions. Each party used data to back up their claims. Similarly, in the mid-twentieth century, the recording industry campaigned against radio companies in order to gain broadcast royalties, again using numbers for their cause. These conflicts have continued into the current century. The recording industry has commanded a large share of the pie for streaming income; a share that is being challenged by the publishing industry as being numerically unfair.

³ These reports were issued from 2014 to 2018. In 2019, UK Music updated their methodology and gave their report a new name. It is now known as *Music by Numbers*, a term that was already familiar to the editors of this book.

In the meantime, a separate statistical tendency has witnessed the need to coalesce. The recorded and music publishing industries have realized that policy makers will be more accommodating to their needs if they are expressed collectively. Those lobbied against prefer one 'big number' rather than a plethora of conflicting statistics. In coming together like this, these music industry sectors are reflecting wider trends. Ruth Towse has noted the growth of 'cultural accounting' over the last forty years (2001: 26). Starting at the highest level, there has been a move by global bodies, such as the United Nations Educational, Scientific and Cultural Organization (UNESCO), to identify the total economic worth of the cultural industries. Thereafter, this cause has been taken up at continental, national, regional and civic levels. A notable initiative was conducted by Britain's 'new Labour' government of 1997-2010. They rebranded the culture industries as the 'creative industries' and undertook mapping exercises to assess their contribution to UK gross domestic product. These exercises were undertaken, in part, because there was a drive for governmental departments to 'show measurable outputs' in order to gain 'investment' from the Treasury (Garnham 2005: 16). More broadly, the Labour party wished to document and support a transformed society, as well as a transformed socialism, which were shifting from heavy industry to a 'creative' economy (ibid.).

These government-led initiatives have been echoed by creative businesses, with music companies being particularly adept at adopting the 'facts for advocacy' approach (Towse 2001: 27). Thus, the Labour party's mantra that the creative industries are more economically important than heavy manufacturing industries (Newbiggin n.d.) has been followed by suggestions that the music business is worth more than the steel industry (Cloonan 2007: 68) and that the record industry invests more in research and development than the pharmaceutical sector (IFPI 2012: 9). Music industry journalist

Chris Cooke has noted the circularity of this process, suggesting that the music companies calculate their value 'so that stat-loving politicians can then quote it back at them' (2019). Having attracted the interests of policy makers via their economic vitality, the music industries then indicate the means by which they can be further nourished. For much of the twenty-first century the focus of the recording and music publishing industries has been on the need to 'ratchet up' copyright law (Sell 2010). Piracy has been a principal target. Its costs to the industries have been calculated, somewhat dubiously, on the basis of lost sales. Latterly, the copyright holding industries have also coalesced around the subject of 'safe harbours' and the 'value gap', arguing that service providers such as YouTube should be liable for content that has not been properly licensed. Lobbying is an ongoing project: the overall message is that more can be done. The music industries outline their monetary and cultural riches, but suggest that these can only be extended if the political economy is fine-tuned to their needs.

The decline of mass manufacture has happened both beyond and within the production of culture, hence it is possible to contrast the triumphs of the creative economy with the falling away of heavy industry. When it comes to the music industries this transformation is manifesting itself in two ways. First, there has been the rise of third main pillar of the business: the live music industry. It has been suggested that this sector is now more economically important than either the recording or music publishing industries. Second, there has been the decline of physical sales of recordings and the turn towards digital formats such as downloads and streams. These developments both bear out and challenge some of Attali's claims. Central to his analysis was the idea that music is prophetic. He argued that it heralds each 'new stage in the organization of capitalism' ([1977] 1985: 32). With the triumph of live music we nevertheless have a retreat to one of Attali's earlier musical stages: the era of

'representation', which was dominated by 'spectacle' (ibid.: 31-32). We also witness the return of 'competitive capitalism, the primitive mode of capitalism' (ibid.). Despite some appearances, live music is not mass produced; its products are differentially priced and its spoils are determined by negotiation rather than 'statistical keys' (ibid.: 84). As a result of this economic variety, the live music business has traditionally been less given to the reporting of data than the royalty-paying industries. It also has different concerns. Rather than focusing on intellectual property and its abuses, the interests of venue owners and operators have instead been focused on achieving favourable licensing and planning regulations. From the perspective of policy makers, these concerns are most redolent when live music is couched as a positive factor in the economic and cultural vibrancy of cities and towns. The growing importance of these issues and the wealth of this sector have between them prompted a statistical turn. Recent years have seen a number of live music censuses, as well a trend for figures that attempt to calculate the overall value of the trade.

The digitalization of culture has further complicated Attali's analysis. The record industry has been at the vanguard. It experienced the threat of peer-to-peer piracy ahead of the other cultural industries and it is arguable that it has adapted to the online economy more quickly than other sectors. This would appear to bear out Attali's prescience: music is again acting as 'a herald of times to come' (ibid.: 32). There are aspects of this digital embrace that are prosaic and conservative, however. Sound recordings experienced online piracy ahead of films, for example, because they occupy less code and therefore their digital files have been easier to compress. Moreover, while it looked for a time as though online piracy would break the hegemony of the major record companies, they were eventually able to use its statistical trail for their own ends. The data from piracy helped them to extend copyright's reach, both legislatively

(in terms of gaining longer and stronger terms) and punitively (in enabling them to clampdown on the transgressions of individual consumers). And it is not only the threat from piracy that has been withstood; the record companies have also held their ground in the face of digital pioneers. Service providers such as Apple and Spotify now constitute major forces in the music world, but they have not become rights holders. This is in contrast to the film and broadcast industries, where companies like Netflix are not only offering new means of distributing audio-visual material, they are also creating content. To reinforce its position, the recording industry has established legislation which ensures that its revenue for downloads and on-demand streams is treated in a similar manner to the revenue from mass reproduction: the 'making available' right exempts it from collection society administration.⁴ As a result, it is the record companies who determine the remuneration rates for their artists. They also have responsibility for negotiating licences with service providers. Consequently, their control over copyright redounds: the service providers want access to their full repertoire of works; to gain it they are willing to forgo the creation of content of their own. And so, while Attali argued that music's 'styles and economic organization are

⁴ The making available right was formulated as part of the World Intellectual Property Organization's *Performances and Phonograms Treaty* in 1996. It addresses digital formats that the public can access 'from a place and at a time individually chosen by them' (WIPO 1996: Art. 10, Art. 14). Not only does this definition echo Benjamin's description of mechanical reproduction 'permitting the reproduction to meet the beholder or listener in his own particular situation' ([1935] 1999:215), the making available right also facilitates the continuation of previous economic practices. Although it can be enacted as sub-set of the reproduction right, the communication to the public right is 'probably the preferred choice in most countries' (IFPI 2003, p. 2). The making available right does not have to operate as other communication to the public rights do, however. In many countries it is not subject to equitable remuneration rules, which would mean that recording artists receive a set percentage of revenue, administered by a collection society. Instead, the record companies have an exclusive right, which they can control as they wish.

ahead of the rest of society because it explores, much faster than material reality can, the entire range of possibilities in a given code', this has not yet happened in the digital domain (ibid.: 11). Most of the old major music companies remain incumbent. More generally, the industries' practice has been expanded rather than transformed. Downloading and streaming have stimulated the growth of a long tail of cultural creators (Anderson 2009), but the market remains skewed to the blockbuster hits of the larger corporations (Elberse 2014). Similarly, the rise of new economic systems, such as crowdfunding, has not witnessed a parallel decline of earlier remunerative methods. Royalties are predominant.

There has nevertheless been a revolution in musical statistics. Ironically, this is because Attali was mistaken in another of his prognoses. He believed that music was presaging the 'the disappearance of use-value in mass production and the final triumph of exchange-value' ([1977] 1985: 84). With the rise of on-demand streaming we are witnessing the reverse. This means of distribution now generates greater revenue than mass-produced physical formats. It has also brought with it the return of use-value. This use-value is different in kind to most of its predecessors, however: exchange-value has been collapsed into it.⁵ Every play of a recording can now be documented. The result is challenging ontologically; popularity charts that were once focused on exchange are now having to incorporate use. It is also challenging in terms of the volume of data. Royalties are based on the number of times a recording is accessed rather than the

⁵ Jukeboxes and radio broadcasting each offer something of a precedent. Jukebox profits are determined by the amount of times a song is played. This usage has not devolved to royalty payments, however: in America, jukeboxes were for a long time exempt from copyright royalties, while in the UK the copyright licensing of jukeboxes has been set by the size of the venue rather than the music played. It is therefore only the jukebox operators who receive payments by results. Broadcast royalties, in contrast, are frequently determined by usage. Nevertheless, this is not a usage that is made 'on demand' by consumers. The choice of listening is determined, in the first instance, by the broadcasting companies.

number of times it is sold. This practice, combined with the openness of the digital environment, has meant that collection societies, music publishers and record companies are now attempting to capture trillions of lines of information about millions of songs and recordings. It has also led to speculation about how best to tackle this Sisyphean task. Technologies such as blockchain promise to not only capture all of the data about each of these recordings, but also to report and remunerate every usage the instant it occurs.

Audience analysis has been similarly transformed by the rise of on-demand streams. Purchase habits have long been monitored, and there have also been examinations of the uses that consumers have made of songs and recordings. These investigations have previously been restricted in nature, however. Prior to this century they were based on the narrow circulation of questionnaires, surveys and focus groups. Downloading upped the ante somewhat, but its returns look quaint in comparison to the information that is supplied by streaming. The listening habits of all consumers can now be documented. Furthermore, while this data is generally restricted to the capture of quantitative rather than qualitative use, it is nevertheless being employed in the service of listening activity. Audience engagement shapes and is shaped by the algorithmic conventions of streams.

Musical statistics have always been troubling. They have helped to construct the blockbuster markets of the music industries; they have been deployed in partisan debates about royalty payments; and they have been used in lobbying campaigns to sway governments and other policy makers. Now they are being generated by audiences who they in turn attempt to generate. These practices lead to a supplementary issue: what if the figures are falsified? As the main reporters or commissioners of their own statistics, the music industries have the ability to distort,

bury or utilize them in accordance with their own desires. This has led some people to doubt the veracity of their numbers, calling out the industries whenever a loose statistic or rough estimate can be discerned. These complaints are most pronounced in respect of the figures for piracy, and with some justification. Not only are piracy statistics some of the hardest to verify, they are also amongst the most consequential. Nevertheless, it is not just governments, legislators and consumers who are being manipulated by statistics; the music industries conduct their own businesses in accordance with figures they have biased. They invest in artists on the basis of chart placements and sales figures that they have massaged themselves. They believe their own hype. It is tempting to see something hyperreal in this process. In line with Jean Baudrillard's theories, the music industries' activities are based on 'models of a real without origin or reality' (1994: 1). Yet it would be a mistake to go this far. Most industry statistics are based on some form of truth. As such, the role of researchers should not be to adopt the position of numerical deniers, rejecting figures out of hand as fictitious creations. More fruitful pursuits are to find out what has been framed, what has been obscured and what is of consequence.

About this book

The purpose of *Music by Numbers* is to explore the manifold uses and abuses of statistics within the music industries. Contributors have been invited to analyze, expose and even create their own numbers. The authors have a range of professional and disciplinary backgrounds. This book includes explorations of industry activity from academics versed in sociology, media studies, communication studies and popular music studies. Some of the contributors are industry insiders, offering their own perspectives on the

professional deployment of statistics. Others are academic insiders, providing self-analyses of their involvement with data.

The book opens with a section on winners and losers, which is comprised of three inter-related chapters by Richard Osborne. In the opening chapter he addresses the manipulation of the UK singles chart, tracing the manner in which it has been hyped by record companies and how its rules have been changed to suit the recording industry's needs. The second chapter looks at the sales awards issued by this industry: gold, silver, platinum and diamond discs. Here Osborne examines the mutability of criteria and looks at how the awards conceal as much as they reveal. They are concerned solely with sales and usage, saying nothing of the relative profitability of recordings. Following on from this, profitability is the focus of the third chapter, which explores the consequences of the recording industry's axiom that only one in ten of its projects will achieve financial success. Most notably, this statistic has been used in defence of the record companies' ownership of sound recording copyright and the restrictive nature of their contracts.

Part two of the book looks at music policy. David Arditi's chapter assesses the annual revenue figures issued by IFPI. It is his argument that the organization has consciously precluded general access to its full reports, which in turn has meant they have withheld a narrative that counters the prevailing story presented by the recording industry in the first decade of the twenty-first century. The industry argued that digital piracy was the sole reason for the decline in their trade, whereas IFPI's analysis sometimes belies this fact. In addition, Arditi reveals that IFPI's data has been inconsistent. Their reports have featured different sources of income and they have altered their figures, falsifying a downward trend as a means of arguing for increased copyright protection. Where Arditi's work demonstrates the mutability of numbers, the

succeeding chapter by Shain Shapiro investigates their strict imposition. He addresses popular music funding in Canada, where quotas have been implemented to ensure that broadcasters play a set amount of music by local artists and that funding is distributed in accordance with the national industries' needs. These figures can still be tactically manipulated, nonetheless. Shapiro demonstrates means by which record companies and artists have negotiated access to funding, and ways that radio companies have manipulated quotas to suit their own broadcast interests. He is focused on changes that transformed Canadian funding during the twenty-first century, witnessing a turn towards commercial rather than cultural support, and to newness defined by quantitative rather than qualitative means.

The third part of the book turns to the live music industry. In the first chapter of this section Adam Behr, Matt Brennan, Martin Cloonan and Emma Webster provide an account of their experiences producing a national live music census. They document the rewards and drawbacks of working with industry partners, as well as the difficulties and imperatives involved in accumulating data. There is a drive, from media and industry, to produce a 'big number' that totalizes value. The results of a census are, however, more diffuse than this. Big numbers are also conjured in the next chapter, in which Dave Laing examines attempts to calculate the overall value of the live music industry. He looks at data compiled for Australia, France, Germany, Italy, the UK and US/Canada, and tabulates the different sources of income that have been employed in the countries' surveys. These figures have been used to compare the income of live music with the trade figures for recorded music, commonly as a means of establishing the ascendancy of the former over the latter. In the following chapter, Richard Osborne takes a closer look at such analyses, highlighting fundamental differences in the way the figures for live music and recorded music are compiled.

Part four addresses piracy. This section begins with Lucas Logan's examination of the police raid and criminal prosecution of OiNK.CD, which he regards as exemplary of the 'upward ratchet' of copyright law. It is his argument that this prosecution misrepresented the nature of this file-sharing site and misunderstood the activities of its users. In the following chapter, Lola Costa Gálvez explores the situation in Spain, which has responded to its status as a notoriously piratical country by criminalizing infringing activity. She looks at the questionable role of professional institutions as they influence the government with data and inculcate school children with propaganda. Costa Gálvez joins Logan and Arditì in querying the veracity of piracy statistics. In the following chapter, Vanessa Bastian and Dennis Collopy take a closer look at the compilation of these figures, detailing a report they were commissioned to write for the UK's Intellectual Property Office in 2013/2014. They were requested to examine methods used to measure the infringement of intellectual property rights. Unsurprisingly, they found weaknesses and biases. The authors did, however, also find some practices to commend.

In conclusion, the fifth part of the book takes us towards digital solutions. In his chapter tracing the receipt of one penny from Brazil, Michael Jones gives a first-hand account as a songwriter facing the bewildering environment of digital royalties and music publishing contracts. He delves into the reams of data with which publishers now 'dazzle' their songwriters and contemplates their misleading habit of referring to them as 'clients'. Jones contrasts the lack of industry employed by his publishers to promote his songs with the considerable effort they expend in tracking miniscule royalties. The next chapter, by Marcus O'Dair, examines one of the vaunted solutions to these issues. He addresses blockchain technology, which among other things has been proposed as a means of revolutionizing artist contracts and improving the efficiency of payments.

O'Dair explores claims made for and against this technology, arguing that the financial speculation around it is misleading. He suggests that if we wish to properly gauge blockchain's worth we should conduct specific, small-scale studies and bear in mind its longer-term value. Undertaking his own measurements, O'Dair seeks to determine whether blockchain has the potential to be a 'disruptive technology' and concludes that it could well be transformative for the music industries.

In the final chapter, Craig Hamilton contextualizes and critiques his own Harkive Project. First established in 2013, Harkive invites participants to reflect about their experiences with music. This includes 'reflections on how recently emerged data-derived technologies now play a key role within that activity'. Hamilton raises crucial issues about the use of online data. He questions whether it can ever accurately profile the engagement of a consumer, but notes at the same time that consumers are being constructed by their profiles. He indicates the complicity of researchers as they undertake their own work in this field; they may well have intentions to operate critically and independently, but they are also accumulating information that can be utilized by governments and corporations. Hamilton nevertheless argues that the data generated by Internet technologies has the ability to expand the scope of humanities research. Ultimately, he recommends a 'reflexive, experimental and exploratory methodological approach' for engaging practically and critically with these technologies. He also provides a nuanced account of how statistics can be used and abused.

Dave Laing (1947-2019)

Music by Numbers is Dave Laing's idea. He coined the title and initiated the concept.

Given his conviviality, it is fitting that I first heard him propose this book over drinks in

a pub. He was in search of a young and energetic co-editor. Fitting neither characteristic, but interested in the topic and keen to collaborate with Dave, I volunteered anyway. From January 2016 until late 2018 we worked together on the project, issuing the call for chapters, editing the contributions, establishing the structure of the book and securing a contract.

Dave died in January 2019. The effect on his colleagues has been profound and the tributes have been manifold, appearing in scholarly websites, academic journals, trade magazines and national newspapers. Their diversity and emotional tenor are testament to Dave's widespread influence and appeal. He had a unique knowledge of popular music, he was exceptionally generous with this knowledge and he was phenomenally good company. I always made a beeline for him at conferences, relishing his incisive intellect and wit.

He was a father figure of popular music studies. His book *The Sound of Our Time* was published in 1969. It can be regarded as the first scholarly monograph about popular music written by an insider and fan. He was one of the founding editors of *Popular Music*, the first academic journal devoted to the subject. His 1985 book *One Chord Wonders* offered one of the original, and still one of the best, scholarly analyses of punk rock. Dave was also one of the most knowledgeable and perceptive writers about the music industries. He was the person to turn to whether you required historical information or if you wanted to assess contemporary transformations.

Dave achieved most of this outside of academia. He did not hold a university post until 1996. Before that he was a freelance author, journalist and lecturer. Between 1972 and 1984 he contributed to *Time Out*, *Sounds*, *Let It Rock*, the *Radio One History of Pop* and many more besides. In 1984 he assumed a post as Research and Press Officer for IFPI. From 1987 to 1996 he worked as an editor for the music industry

journals *Music Week*, *Music Business International* and *Financial Times Music & Copyright*.

I first got to know him when he was one of the examiners for my Ph.D. He was rigorous, picking me up on what others might pass by (I was reprimanded for detailing the wrong year for Friedrich Kittler's *Gramophone, Film, Typewriter*, listing the date of the German language publication rather than the translation I had used). He also improved the work tremendously. The structural changes he recommended helped me turn the thesis into a book (Osborne 2012).

The process of working on *Music by Numbers* together was hugely rewarding. I am glad that the collection includes chapters by his friends and by people whose careers he guided. All of the contributors are admirers. Dave was due to write two chapters: one on the charts and one exploring calculations of the economic value of music. We both felt that the former topic must be covered in a book such as this. In his absence, I have tackled it myself. I would not dare to presume that my thoughts about the charts are the same as Dave's, however, or that I could address the topic with his level of experience and erudition. In place of the second of his proposed chapters, I have included a blog entry that Dave contributed to the *Live Music Exchange* (Laing 2012). It provides an example of the breadth of his knowledge, and the thoroughness and concision with which he completed each writing task.

To say that Dave will be missed is an understatement. He is irreplaceable. In the aftermath of his passing I found myself turning to Laurie Anderson's 'World Without End', which has one of the most devastating lyrics in all of popular music:

When my father died we put him in the ground

When my father died it was like a whole library had burned down (Anderson 1994)

Music by Numbers is dedicated to Dave's memory.

References

Anderson, Chris (2009), *The Longer Long Tail*, London: Random House Business Books.

Anderson, Laurie (1994), 'World Without End', CD, Burbank: Warner Bros.

Attali, Jacques ([1977] 1985), *Noise: The Political Economy of Music* (trans. B. Massumi), Minneapolis and London: University of Minnesota Press.

Baudrillard, Jean (1994), *Simulacra and Simulation* (trans. S. F Glaser), Ann Arbor: The University of Michigan Press.

Benjamin, Walter ([1935] 1999), 'The Work of Art in the Age of Mechanical Reproduction', in H. Arendt (ed.), *Illuminations* (trans. Harry Zorn), London: Pimlico, pp. 211-244.

Caves, Richard E. (2000), *Creative Industries: Contracts Between Art and Commerce*, Cambridge, MA and London, UK: Harvard.

Cloonan, Martin (2007), *Popular Music and the State in the UK: Culture, Trade or Industry?*, Aldershot: Ashgate.

Cooke, Chris (2019), 'Value of UK Music Industry Tops £5.2 billion, says UK Music', 20 November,

<https://completemusicupdate.com/article/value-of-uk-music-industry-tops-5-2-billion-says-uk-music/>. Accessed 22 November 2019.

The Doors (1969), 'The Soft Parade', LP, New York: Elektra.

Elberse, Anita (2014), *Blockbusters: Why Big Hits – And Big Risks – Are the Future of the Entertainment Business*, London: Faber & Faber.

Frank, Robert H. and Cook, Philip J. (2010), *The Winner-Take-All Society*, London: Virgin Books.

Garnham, Nicholas (2005), 'From Cultural to Creative Industries: An Analysis of the Implications of the "Creative Industries" Approach to Arts and Media Policy Making in the United Kingdom', *International Journal of Cultural Policy*, 11:1, pp. 15-29.

Hunter, Nigel (ed.) (1977), *BPI Yearbook 1977: A Review of the British Record and Tape Industry*, London: BPI.

International Federation of the Phonographic Industry (IFPI) (2012), *Investing in Music: How Music Companies Discover, Nurture and Promote Talent*,

http://www.ifpi.org/content/library/investing_in_music.pdf. Accessed 25 January 2013.

_____ (2003), *The WIPO Treaties: 'Making Available' Right*, London: IFPI.

Kittler, Friedrich (1999), *Gramophone, Film, Typewriter* (trans. G. Winthrop-Young and M. Wutz), Stanford: Stanford University Press.

Laing, Dave (1969), *The Sound of Our Time*, London and Sydney: Sheed and Ward.

_____ (1985), *One Chord Wonders*, Milton Keynes: Open University Press.

_____ (2012), 'What's It Worth? Calculating the Economic Value of Live Music', Live Music Exchange Blog, 11 June, <http://livemusicexchange.org/blog/whats-it-worth-calculating-the-economic-value-of-live-music-dave-laing/>. Accessed 26 January 2019.

Martland, Peter (2013), *Recording History: The British Record Industry 1988-1931*, Lanham: Scarecrow Press.

Newbigin, John (n. d.), 'What is the Creative Economy?', British Council: Creative Economy, <https://creativeeconomy.britishcouncil.org/guide/what-creative-economy/>.

Accessed 7 November 2019.

'number, n.' (1989), *Oxford English Dictionary*, 2nd ed., Oxford: Oxford University Press.

Osborne, Richard (2012), *Vinyl: A History of the Analogue Record*, Farnham: Ashgate.

Ravid, S. Abraham (2005), 'Film Production in the Digital Age', in C. Moul (ed.), *A Concise Handbook of Movie Industry Economics*, Cambridge: Cambridge University Press, pp. 32-58.

Rye, Mark (2017), *Inside Looking Out: Rock and Roll Stories from Inside the British Music Business*, Surrey: RockHistory.

Scaping, Peter, (ed.) (1979), *BPI Yearbook 1977: A Review of the British Record and Tape Industry*, London: BPI.

_____ (1986), *BPI Yearbook 1986: A Statistical Description of the British Record Industry*, London: BPI.

Sell, Susan (2010), 'The Global IP Upward Ratchet, Anti-counterfeiting and Piracy Enforcement Efforts: The State of Play', *PIJIP Research Paper Series*,

<http://digitalcommons.wcl.american.edu/research/15/>. Accessed 6 November 2019.

'statistics, n.' (1989), *Oxford English Dictionary*, 2nd ed., Oxford: Oxford University Press.

Strachan, Robert and Leonard, Marion (2003), 'Charts', in J. Shepherd, D. Horn, D. Laing, P. Oliver and P. Wicke (eds), *Continuum Encyclopedia of Popular Music of the World: Volume 1: Media, Industry and Society*, London and New York: Continuum, pp. 535-541.

Towse, Ruth (2001), *Creativity, Incentive and Reward: An Economic Analysis of Copyright and Culture in the Information Age*, Cheltenham, UK and Northampton, MA: Edward Elgar.

Towse, Ruth (2015), 'Copyright and Business Models in UK Music Publishing', working paper, Glasgow: University of Glasgow/CREATE.

Williamson, John and Cloonan, Martin (2007), 'Rethinking the Music Industry', *Popular Music*, 26:2, pp. 305-322.

World Intellectual Property Organization (WIPO) (1996), *Performances and Phonograms Treaty*.