



On Critical Listening, Musicianship And The Art Of Record Production

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Introduction

The idea of a 'record producer' is a slippery one. As Mike Howlett tactfully puts it, "at its simplest, the producer's task is to produce a satisfactory outcome" (2012, p.190). Elsewhere more noisily described as arranger, co-writer, industry interface, mix engineer liaison, mentor and more – a producer at the helm of a team assumes a Fordist assembly model reminiscent of the late 20th century recording industry but less so of present day independent arrangements. While there may be a role for divisions of labour under certain circumstances, post computer revolution there is a lop-sided working continuum for producers of music: from laptop music making, to home studios and social networks, through to increasingly rarer opportunities to engage directly with the promise of panoramic control rooms, refined acoustic spaces, concept funding, and professional distribution and promotion. In parallel to these events there has been an explosion in the availability of higher education for contemporary musicianship in the recording environment. Many universities provide exactly the infrastructure reminiscent of music industry and this not only includes high-end recording studios and acoustic spaces, but also the 'backing' of artistic development, performance /dissemination opportunities, and (in Australia), the state-subsidised arrangements across the lifespan of a contract-as-degree programme. Reminiscent of industry apprenticeships and mentoring, there has also been an exponential rise in practice-based higher degree research enrolments (Draper & Harrison, 2011) many of which are supervised to devise creative outputs underpinned by exegeses. As Katia Isakoff offers,

... provide[s] common ground for practitioners and researchers to meet and collaborate ... those instances that breach accepted practices and make use of creative and critical approaches in a profound way to our store of knowledge and understanding. This is the legacy of what artist-researchers have to offer (2012, p. 274).

The development of undergraduate craft through to so-called 'artistic research' (Biggs & Karlsson, 2010) requires reflexive responses to rapidly evolving academic fields. In terms of 'the art' of record production, the idea of *producer* has revised meanings worth exploring here. In this paper I therefore offer a review of pertinent literature in order to argue some broader implications for how both curricula and artistic research methods might be considered.

Locating The Listening



Figure 1: *Blind monks examining an elephant*, by Hanabusa Itch? (1652 –1724).

The story of the blind men and the elephant is a useful metaphor for this project. A group of blind men touch an elephant to learn what it is like. Each one touches a different part, but only one part, such as the side or the tusk. They then compare notes on what they felt and learn they are in complete disagreement. In recent music seminars at my university I was reminded of this story when we approached the topic of ‘critical listening’. Students were invited to discuss their favourite music and while this revealed fascinating insights, it was also clear that there were as many interpretations and approaches to listening to recorded music as there were presenters.

Conversely, given a set music piece everyone could describe that same ‘elephant’ in many different ways. Similarly, when I approached academic staff it was evident that there were a number of presumptions in play, some related to pedagogy or assessment, while others reflected beliefs according to discipline, qualifications, or working conditions. To drill down further, these understandings about listening were quite different from the many external forms of evaluation schema theorised elsewhere. At its most basic, engagement was via highly personalised practice-based drivers – “What is *that music* doing?” and, “How can *I* do that?” Across assorted sub-disciplines this tended to reflect an internalised historical understanding of recorded music as a primary source. For example: for jazz-ers in how to listen to and/or mimic solos and changes; for composers, in how to understand form, function, or ensemble complexities; through to sound recordists where the associations between close listening and technological decision-making were reminiscent of the relationships between instrumentalist and instrument – “I want *that* compressor!” In all of this, musicians wished to be *producers* of music while striving to achieve far more than merely a satisfactory outcome. The ways in which this might be achieved was certainly variable (from stage, to score, to conducting, to recording), but overall these ideas frame the premise for the next stage of this paper in that the essential skill for

the record producer – like for every musician – begins with the ears.

Scope And Foci

Admittedly, the elephant metaphor presents a larger puzzle which cannot be fully unpacked here, however in terms of its general aims this paper is positioned as a pilot enquiry with some boundaries to intentionally limit its scope. In terms of university contexts which may substitute for apprenticeships of old, one way to frame this is to prioritise just a few desirable key learning outcomes for musician producers in a recording studio setting.

From my own academic experience there are three elements that repeatedly come to the fore. Firstly there is the oft cited application of critical listening but proves to be hard to pin down (as above). It would seem that individual claims are not well articulated – a *doxa* assuming everyone in a given ‘tribe’ knows about their ears, yet where practice-based derivations of a given theoretical framework may be less clear. This paper will therefore incorporate a short review of relevant literature, aiming to i) assist the practitioner in locating their work, and ii) set some contextual parameters for subsequent case studies. I do not claim that this scan will be comprehensive but I do intend that this might be helpful as a general starting point.

The second phenomenon is the interplay (or struggle) between music and technology. On the one hand, the tools themselves may easily subsume the original musical intentions for the inexperienced, while on the other, improvisation and ‘flow’ would seem congruent with the less easily revealed art-making of the experienced producer. Accordingly, the paper will comment on recent scholarship about artistic research (Borgdorff, 2012) which examines the shifting relationships between so called ‘technical objects’ and ‘epistemic things’.

The third perspective is in the development of the *self* – that is, of ‘insider’ understandings and reflective /practice-based /artistic research processes as higher order thinking. While much of the broader music literature orients around the analysis or critique of other’s works, there are far fewer examples of how an individual exposes their own music-making endeavours to rigorous academic examination in terms of questions, methods, data, findings and validity. To this end, the paper will explore case study excerpts to illuminate the discussion further.

1) Approaches To Critical Listening

Producer and mix engineer Kevin Augunas reflects on the making of *The Lumineers* album:

... the first thing I did with many songs was to delete a bunch of tracks and take off the plugs, because I wasn’t hearing the songs in that way. To me these extra tracks and these plug-ins were examples of people overdoing things in DAWs because they could, whereas you need to focus on arranging ... OK, we cut away all the fat from the song ... What are we missing, or are we complete? If we felt there were things missing, the band would record them in the live room, and they would add tracks. After that the final mixes were a matter of setting levels, reverbs and delays, panning things ... That is all mixing should be. (cited in Tingen: 2013, p. 16)

This piece is indicative in useful ways. It highlights the ‘wholeness’ of the setting and although scant in operational detail, Augunas implies important considerations in only a few lines: critical listening for inclusion or absence, statement, song form, tracks, arrangement, mix, FX – and overall, the sense of an individualised approach. While much of this may quietly reflect the writer’s extensive professional experience and interactions over time, there are a number of well-developed critical listening theories central to expanding on this further.

The Tonmeister And The Sound Box

Google ‘critical listening’ and the first hits indicate “the engineer’s point of view ... the physical details of the music – frequency response, dynamic range, tone, imaging, and how instruments are blended together” (White, cited in Shure Blog, 2013). These assumptions are not dissimilar to that of recording students as an emphasis on equipment and the physics of sound, reinforced by routines that spend time in studio immersion at best (or ‘hunt and peck’ at worst). The theoretical models which are commonly used to support this are as follows.

The Tonmeister concept (literally, ‘sound-master’) was proposed by Arnold Schoenberg in 1946 as a way to train (sic)

'soundmen' in the fields of recording, radio and film. First introduced in Germany in the same year, the word *tonmeister* was later trademarked by the University of Surrey in 1986 (Borwick, 1973). From out of this tradition, a systematised regime of listening exercises emerged to provide increasing levels of difficulty in identifying frequency bands, levels and their interrelationships for the trained sound engineer. Various terms *spectral solfège* (at the author's institution), *timbre solfège* (Miskiewicz, 1992), or *auditory solfège* (Moulton, 2013), the later is available as the Moulton Laboratories Golden Ears program and CD sets (ibid). Jason Corey (2010) also provides for this and more in his book, *Audio Production and Critical Listening: Technical Ear Training*.

Elsewhere beyond fundamental EQ ear training a second element often arises, be it in undergraduate essays or in proposals for higher degree research. When projects offer an analysis of the author's own work as a reflective practitioner (Schön, 1983), they often cite 'critical listening' as a (somewhat vague) methodology for evaluation. In some cases this is indeed revealed as an investigation of sound engineering decision-making processes, and to this end a frequently adopted approach is detailed in William Moylan's work, *The art of recording: Understanding and crafting the mix* (2002). In this, Moylan helpfully provides a range of exemplars to analyse well known recordings via the use of stereo placement, EQ, dynamics and overall staging schema represented diagrammatically as a 'sound box' between the speakers.

The Musical Object And The Reduced Listener

While the aforementioned methods are generally tied to familiar musical sources, the fields of electroacoustics (electronics), *musique concrète* ('real' sounds) and acousmatics (both) take a different direction. The first two traditions come from a history of electronic composition, tape loops and computer music where the sounds themselves are processed and combined from any origins of interest, for example: ambient natural sources, machinery, synthesizers, tape effects and so on (Camilleri & Smalley, 2008). Many music students have creative opportunities to explore this further through 'sound art' productions which provide an engaging platform to further refine their skills with DAWs, plug-ins, processing and mixing, but without the usual pre-emptive baggage about song form, market place and the like.

The field of acousmatics makes a valuable departure point in that because such abstract works are composed exclusively for loudspeaker presentation, this has allowed for expanded thinking about the idea of critical listening where due consideration is given to exclusively sound-based characteristics, say, including timbre and spectrum. For many theorists what matters most is exactly *how* the listener listens, as Pierre Schaeffer (1966) elaborates in his *Traité des Objets Musicaux* (Treatise on Musical Objects) via broad categories of passive (*ouïr*), casual (*écouter*), discriminatory (*entendre*) and intended or 'semantic' listening (*comprendre*). Because of the subtlety and shades of meaning available in the French language, there has been useful international examination of Schaeffer's seminal work. One key English text is that of *The Digital Musician* (2012) where Andrew Hugill writes,

... this led Schaeffer to his most famous notion: *reduced listening*. This means listening to a sound for its own sake, *in itself*, as what Schaeffer calls a 'sound object', by removing its real or supposed source and any meaning it may convey. A sound can have inherent value on its own and not just because of what it may appear to represent. Schaeffer recognized that this is different from ordinary listening and is, therefore, somewhat unnatural. The benefit of listening in this way is that we can understand sonic phenomena for themselves and in themselves (pp. 21–22)

The book goes on to provide a detailed guide to further reading, listening, practice and application in a format designed for use by educators and students alike. At its core, Hugill explains how a reduced listening aesthetic may benefit sound producers of all persuasions.

The Critic And The Artist

Schaeffer's notion of *comprendre* provides a segue into the field of semiotic analysis now so prevalent in popular music studies, aiming to "link[s] musical structure with other aspects of culture and society" (Tagg, 2013). Some argue that this field arose comparatively recently in the UK as a reaction to the dominance of classical musicology (Middleton, 1993), and/or in order to gain credibility in the burgeoning business of university credentialization. While often intellectually compelling as analyses of familiar recordings, many of these pieces may also be disconcerting or at least humorous to artists when such interrogations are seen to be devised by academic critics and not by practitioners, and/or – if the writer is indeed an accomplished musician, opinions are subjugated to the background given conservative concerns for validity. However, recent hybrid methodologies have

emerged to reason several standpoints within a single reading. Underpinned by a semiotic framework, they incorporate other schema in meaningful ways: from musical analysis (scores, forms), to acoustmatic considerations, or the use of the between speaker 'sound box' or similar graphical representations. Of interest to practice-based researchers, the persona of the writer tends to be less well 'disguised' but more critically self-aware. Two examples of this kind of work are identified here, both of which notably begin with artistic disclaimers. Allan Moore (2012) writes:

It is not about what songs 'actually' seem to mean, its about *how* they mean, and *the means* by which they mean (p. 33)

Similarly, Aaron Liu-Rosenbaum (2012) offers:

Importantly, there is no claim of intentionality on the part of the artists or recordists, though elements of a sonic narrative may indeed be so. (p. 1)

Clearly this proves to be the case as the reader is guided through a detailed hybrid analysis of Led Zeppelin's *When The Levee Breaks*, interspersed with intriguing historical citations from Jimmy Page as producer, arranger and performer. One is led to consider how this kind of thinking might be viewed by Page himself, or in framing the author's own music-making (if applicable), or more centrally: in what ways might this be adapted by other artists to assist in examining their original works? Moore (2012) expands on these points in his book, which – following the presentation of a series of differing analytical frameworks – concludes with four valuable chapters: *Reference*, a comprehensive overview of the pertinent analysis literature; *Belonging*, on relationships between musicians and sounds; *Syntheses*, integrating earlier viewpoints together into single readings; and *Questions*, a comprehensive list of research questions, many of which may be valuable to the practice-based music researcher.

The Musician And The Music

In addition to specialised ear training, some meta considerations are worth considering as fundamental to a position on practice-based research. If the producer may be considered a 'composer' in the broadest sense, then Richard Vella (2000) leverages this into his *Musical Environments: A Manual for Listening, Composing and Improvising*. Each chapter is accompanied with listening examples from a wide range of world cultures and styles to be experienced, discussed and analysed. Well suited to in-studio contexts, the book progresses with improvisation and composition exercises which allow practitioners flexible application according to their own needs. Elsewhere, in the paper *The Marriage of Art and Academia*, Huib Schippers (2007) insightfully expands 'the studio' as a place where,

Thousands of deeply considered and split-second decisions are made using notation or memory; ideas from publications about music (structure, history); consulted or remembered recordings in private collection and libraries and performances; learned, acquired and developed values; experience and assessment of audience reactions; and probably most importantly an aural library, which, for a mature musician, would typically consist of 20,000 to 50,000 hours of listening, learning and playing. (p. 3)

This idea of an 'aural library' has resonance in relation to musicians interpretations of sound recordings. In this, notions of critical listening are informed by a 'personal psychology' of music initially dependent on matters such as opportunity, access, nationality, or peer group. Dave Collins (2012) takes this further in the edited collection, *The Act of Musical Composition: Studies in the Creative Process* where contributors examine musical perception, performance, preferences, and memory. The central themes focus on time-based work: from compositional processes, through to creative thinking and problem-solving, these aspects are integrated alongside theoretical understandings of creativity and empirically supported reflective practice.

2) An Interplay Between Technology And Music

It could be posed that the producer undertakes the 'laboratory' phase of the research in the recording studio. Here is where epistemological questions are asked, but are intertwined with applied skills and the operation of technical devices, ideally so that "[recording] ... is not something done *to* music but a process in which sound becomes music" (Frith & Zagorski-Thomas: 2012, p. 277). Over time the producer more confidently and transparently interacts with the recording studio as a musical ensemble to create persona and style in sound as a desirable outcome. Simultaneously however, such embodied knowledge may challenge explication at advanced levels and/or as academic research. Henk Borgdorff elaborates,

Artistic research articulates the fact that our natural relationship with things we encounter is more intimate than we can

know. At the same time, it also familiarises us with the fact that those things are in some way foreign to us ... artistic research is the acceptance of that paradoxical invitation. The artistic, pre-reflective, non-conceptual content enclosed in aesthetic experiences, embodied in art works and enacted in artistic practices is articulated, amplified, contextualised and thought through in the research. (2010, p. 60)

This foregrounds research design considerations in terms of how to unpack, progress and communicate practice-based work. For example, the 'doing' of record production –listening, recording, arranging, editing, processing, mixing – is a very different activity to the post analysis of its by-products. Improvisation, instinct and serendipity are familiar in high creativity situations, whereas the examination of real time actions in may indeed change their outcomes, or as one colleague quipped, "the music *knows* you're looking at it". Further, technologies may forcefully dictate their own outcomes, perpetuated by design assumptions (and celebrity or nostalgia) just as Theodor Adorno once famously wrote, "... an element socially predetermined ... such an objectified impulse of the material has its own kinetic laws" (1973 [1949], p. 3).

Borgdorff (2012) further investigates the relationships between physical tools and creative ideas in a recent chapter, *Artistic Practices and Epistemic Things*. Based on work of Hans-Jörg Rheinberger (Max Planck Institute), this theorizes the philosophy of science and its experimental systems as a shifting interplay between 'technical objects' and 'epistemic things':

Experiments are not merely methodological vehicles to test knowledge that has already been theoretically grounded or hypothetically postulated ... Experimental systems are characterized by the interplay of 'technical objects' [TOs] and 'epistemic things' [ETs] ... [ETs] may turn into [TOs] or instruments, thereby ensuring the relative stability in the experimental system that enables new epistemic things to appear ... [TOs], if deployed differently may sacrifice their stability and diffuse into epistemological questions ... Experimental systems must be sufficiently open to allow these indistinct things to come into view; enough space must be present to produce what we do not yet know. (Borgdorff, 2012, pp. 188–190)

For the record producer as artistic researcher this promises useful ways in which to consider studio practice by acknowledging and examining exactly where these conceptual shifts occur *en route* to overall aims. For example, a project may have had earlier well-conceived methods for achieving its goals, but along the way some elements were rejected while other new techniques may have been 'discovered', investigated further, practiced, then to be intellectually discarded but artistically applied (and retained as new improvisational skills).

Next I will exemplify the discussion thus far via a number of case study extracts. While not reproduced in their entirety, these examples will reflect upon common themes arising from recent practice based projects.

3) Reflections On Reflection In Action

In the following examples, authors have sought to be better producers of music by devising projects to track their insights, emerging skills and new language. In some cases this may have examined only a specific stage of the production continuum, for others, the delivery of an overarching creative portfolio may have been the intention. Whatever the topic, common elements include: i) a quest for the development of musical self; ii) fit for purpose critical listening schema; iii) pathways which reflexively expose creative interactions between musician and technologies, and iv) the adaptation of mixed research methods reminiscent of the social sciences and humanities. These themes are now arranged as a connected narrative.

Technical Enquiry And Skill Building

An undergraduate Honours project examines the dilemma of producing high quality recordings, yet which is known to be destined for lossy codec dissemination. *Mastered for iTunes (MFIT)* (Thomas, 2013) begins with a literature review of data compression technology, then turns to insights from mix and mastering engineers. The dissertation subsequently argues technical schema, null tests and software tools via which to begin to measure some of the differences between high resolution recordings and their encoded counterparts while also adapting the familiar 'sound box' evaluation schema proposed by Moylan (2002). These methods then notably begin to extend and 'mix' because in a final reading, ultimately, the project is realised through a personal application of critical listening accompanied by original recordings. Overall this is paced by a thick description of insights about audio trials via journal entries and reflective comparisons. Ultimately the work aspires to improve the author's artistic practice though optimised tracking, mixing and mastering processes with MFIT delivery in mind.

Another example (Draper, 2011a) offers similar insights into a 'morphing' research trajectory via a quest to incorporate free

improvisations within the DAW production environment. Rather than lose attractive energy or move to formal song-writing, tracking and overdubbing processes, the paper examines if and how the material might be directly incorporated. What emerges is that the lack of bar /beat reference is a block to harnessing the arranging power of a modern DAW, and so the work becomes an investigation into how Logic Pro's tools 'map' the audio material. At this point the project almost entirely shifts to focus on the beat mapping 'technical object' as an 'epistemic thing' (Borgdorff, 2012). This progresses with insights drawn from notes, save as states, screen dumps and the like, but over time becomes increasingly musical – from beat mapping, to marker mapping (form) and harmonic mapping (chordal) – the former technical /epistemological interest begins to fade while new realisations arise as 'mind mapping'. That is, as a result of low level mechanical processes, beat mapping not only becomes a tacit skill, this coding leads to a deeper understanding of the musical material itself.

The 'Little-R' In Artistic Research

In a recent book chapter (Draper & Cunio, 2013), the authors dissect and present the development of a new musical piece: from improvisation, to recording, arranging, and mixing. In this a parallel is made to the well known PhD-by-composition format (new music plus analytical exegesis) as being a potential model via which to undertake all artistic research: that is, as a relationship between creative activity and written intellectual reflection. In this the concept of so-called 'little-r' thinking is elaborated:

... a European conservatoire 'research festival' provided a intensive framework for graduating Master of Music candidates to defend their research projects in compelling blends of talk, text, screen and performance ... Of particular impact was the apparent ease with which students expressed themselves to offer deep insights into the meaning of their own artistic practices while never seeming to offer any less than complete transparency, validity and trustworthiness. To which the institution's principal enthusiastically exclaimed, "Ah no, not the [science] 'big R' rhetoric. We do 'little r' research here – and we're proud of it!!" (Draper, & Cunio: 2013, p. 1).

What would seem increasingly accepted (expected even) for exegetical components are rich and often unique blends of 'little-r' first person writing together with mixed methodologies comprising for example: phenomenology, thick description, action research, and autoethnographies which meaningfully triangulate the practices 'behind the music'. In addition, there is an emphasis on the real time documentation of artistic problem-solving to accompany the emergence of creative works (Collins, 2012) – via save-as states, journals, videos or other forms of multimedia which are often less about product than process. Two notable HDR models for just such work are to be found in *The Intersection of Improvisation and Composition: A Music Practice in Flux* (Knight, 2001) and *Exploring Individuality and Musicianship Through Recording Studio-based Songwriting* (Snell, 2011).

The next examples further elaborate on 'portfolio' research and record production. That is, as a reflective continuum which iteratively informs the making of albums and academic publications.

Record Production And Foreign Objects

In the album *Foreign Objects* (Draper, 2010), Clocked Out Duo devised a collection of new music as a tribute to the work of minimalist composer Terry Riley. This proved to be a demanding project because of the interplay between Eric Griswald on prepared piano and Vanessa Tomlinson's swathe of 'found' percussion, including bottles, bowls, sticks and ropes. For the recordist, the application of tonmeister sensibilities (Borwick, 1973) proved valuable when it was heard that subtle harmonies began to alter when subjected to 'out of the box' techniques including tape saturation or non-linear summing. It was revealed that this interfered with overtones later understood as carefully crafted by the musicians and that high sample rate, minimally processed 'in the box' mixes presented the material at its best. Moreover, these negotiations encouraged a 'reduced listening' aesthetic (Hugill, 2012) appropriate to the sound sources (perhaps previously obscured by familiar elements of groove, pitch and form).

Acousmatics became central to a particular piece entitled 'Lavender Mist' (musically suggesting the Jackson Pollack painting of the same name). Production was made more complex by the integration of material from studio and concert recordings (often edited within a single track). In the case of Lavender Mist however, this stubbornly refused to make musical sense in the studio:

Tomlinson uses ropes tied to a piano leg to move over and play various scattered glass, china, metal and wooden objects on the floor. Griswald accompanies on prepared piano and improvises by watching Tomlinson's body movements and listens to sounds. And in turn she responds to his sounds in an iterative musical process. In live performance the piece was possibly

the highlight of all the music, with audible gasps coming from the audience at times, and being heard and responded to by the performers. This seemed to present a 'complete' work – with the bodies, the performance and stage craft, the interaction by performers with and through the audience. (Draper: 2009, pp. 1–2).



Figure 2: Clocked Out performing Lavender Mist in concert (Clocked Out, 2009).

In a later interview Tomlinson commented,

“This project just didn’t lend itself quite as well [to traditional recording approaches] ... in this particular instance I think we are looking at a more creative mix ... like ‘scoring the sea bed’, examining fragments of bric-a-brac on the floor, uncovering (by striking) different objects” – perhaps aiming to present an ‘acousmatic’ experience of sound ... where a curtain has been lowered between . . constituent sounds and their previous existence in the world . . eliminat[ing their] literal qualities; the listener spontaneously detaches the sound from its source or cause”. (Ibid: p. 2).

In the final analysis, it was decided to use the live recording of Lavender Mist (available online, Clocked Out, 2009) to best represent the aesthetic. Similar to the Jackson Pollack painting and its viewers, perhaps every listener will have a different acousmatic experience.

Semiotics And The Art Of Interpretation

An on-going interest in such issues of representation was discussed in relationship to planned classical music recordings by pianist Stephen Emmerson. Over a subsequent three year period the project would produce a number of research papers (Draper & Emmerson, 2011; 2009; Draper, 2009) as well as a double album set entitled Remixing Modernism (Draper, 2011b). This began as an idea to perform, record and present seminal piano compositions from around the turn of the twentieth century, but aiming to provide new insights and interpretations for younger or mainstream audiences unaware of the works. From the outset, it was advantageous for the record producer to work closely with the pianist who was also a highly accomplished musicologist. From conceptual outset, there became a clear sense of the personal lives of the composers, the stories around the pieces, and the historical contexts within which the music originally resided. Similar to retrospective readings offered by popular musicologists, yet notably different in that these interpretations were to be directly incorporated into the performances and the

recordings going forward. For example, in Bartók's Bagatelles:

Emmerson is convinced that the sharp contrasts in style are part of the overall concept of the work as a cycle of pieces that successively builds with a cohesive sense of narrative progression. Beyond merely a collection of compositional experiments or exercises, he understands them as having strong emotional and programmatic implications that develop through the cycle ... he argues that these pieces reflect Bartók's pain and disillusionment at a failed and unreciprocated love affair with the violinist Stefi Geyer for whom he had composed a violin concerto in the previous year (1907) ... the falling scale passages in the first Bagatelle reflect the sense of being emotionally defeated and depressed, but in this piece they are juxtaposed against the pentatonic, positive and life-affirming right hand part which seems to be the second approach adopted ... (Draper & Emmerson: 2009, p. 3)

Figure 3: 1st Bagatelle, bars 1–5 (*Ibid.*).

Over time, these aspirations were developed via a range of micro audio treatments, to be later termed “DSP orchestration” (Draper & Emmerson: 2011, p. 4). Sometimes applied broadly in slow movements across pieces, at other times, at the note level. Overall, each and every interpretation and decision was made on the basis of historical interpretation though sensitive performance technique in the first instance, then to be highlighted and refined via various production treatments. Semiotic representation was therefore at the heart of the work and as its final outcome was released as a two CD set (Draper, 2011b) – one traditionally produced as the ‘horizontal CD’ to mimic traditional score or performance (from left to right /start to finish), the second as the ‘vertical CD’ to present multiple layers of DSP orchestration /automation as a filmic like reading of the pianist’s musicological readings.

Implications And Conclusions

Overall, this discussion has been in contrast to ‘industry’ literature or interviews with producers in periodicals and websites which trend to assumed generalisations from (increasingly rarer) ‘on the job’ experience – all of which provides arguably little benefit to the discipline. In some quarters there is even resistance to the idea of artistic research, as Katia Isakoff reports:

My problem is with the kind of research being undertaken. I feel a large part of it is somewhat self-indulgent and contributes little to the music industry in a wider sense. Spending hours trying to evaluate why or how a particular artist, engineer or producer achieved a particular result benefits no one and in fact is pretty near impossible because there are too many variables to allow a proper scientific evaluation. (Platt, cited in Isakoff: 2012, p. 274)

As has been reported here, what is central to the work is precisely those spaces where science-oriented assumptions are turned ‘inside out’ to reveal musicianship. Like the story of the blind men and the elephant, researchers examine different parts of their practice to discover that: a creative aim may not have the same intention as a research question; method can often be emergent as ‘findings’; measurement may be futile in seeking to display artistic processes; research conclusions can be embodied in an

artwork. A recent European study confirms,

... [that] the concepts, the technical terms and their related distinctions, assumptions, and theories that are handed down to us by the traditional disciplines ... do not necessarily reflect the way musicians experience and think about their art ... programmes may provide a suitable platform for young musician researchers to develop their own concepts that are truer, or a better reflection of their own perceptions and thoughts. Young researchers may be encouraged to actively influence the world of music research and to determine the research discourses as they see fit and not as they are told to see fit. (Polifonia: 2007, p. 17)

For the future, it would be useful to examine these frameworks *in situ* more closely: how might a given semiotics principal be deployed as a frame for a recording studio project? In what ways might a given technological tool be tracked to understand its shifting epistemological persona? Perhaps like Vella's *Musical Environments* (2000), there may be ways to bridge educational gaps via the design of thoughtful project boundaries, explicit reflective aims, and/or by drawing on visible higher degree exemplars. More broadly, this paper encourages practice-based researchers to make connections with other institutions who may be undertaking this kind of work, and overall, aspire to progress an understanding of 'the art' in record production.

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