

THE CHANGING NATURE OF JAZZ ARTISTS WITHIN THE RECORDING TECHNOLOGY SPACE

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The nature of the recording artist and how they engage within the recording studio as a technological space is changing. The recording studio is an instrument and an artistic process, and so too, technology has enabled the musician to learn the craft of recording, embellishing their instrumental skills. With real-time audio manipulation becoming highly implementable on the live stage for a variety of instrumental situations, what creative agency is lost for the music producer when this technology enters the recording studio? This paper presents multiple perspectives on how modern musicians in jazz-based performance styles are using technology to shift the nature of audio manipulation within the recording studio, with the analysis of a recording by both the artists and the producer.

Introduction

The nature of the recording artist and how they engage within the recording studio as a technological space is in constant flux. The recording studio is accepted as an instrument and recording as an artistic process (Kealy 1979). Knowles & Hewitt (2012) posit that technology is enabling recording practice to merge with performance practice in instrumental style performances. Musicians have learnt production skills to embellish their instrumental skills, weakening the delineation between roles within the studio (ibid). These computer literate musicians have been pivotal in both electronic music recordings and live-stage performance, but musicians working outside this area is our focus here (ibid). The implementation of real-time audio manipulation has developed on the live stage for a variety of stylistic situations, including that of jazz musicians. Jazz recordings have incorporated the techniques of contemporary production in the recording studio (Reynolds 2018). However, these practices can absorb significant amounts of time and energy for the recording studio's production team (see Reynolds 2018; Scott 1999; Watson 2009). This paper investigates the change in the creative agency for the music producer when jazz musicians bring real-time audio manipulation technology into the recording studio. We address this situation through a studio recording of an acoustic jazz trio – *Trichotomy*, of which co-author, Sean Foran is a member, with co-author Lachlan Goold acting as Producer for the recording session. Within the recording, the trio aimed to utilise technology with performative intent, engaging in the creative manipulation of their acoustic sounds in real-time. The musicians analysed the recording process, contrasting this with the field notes of the producer. Subsequently, the produced track is then analysed again, by both the musicians and producer. We argue, the recording aspect of this approach is less engaging for the producer, but the recording process is highly-efficient and much quicker than previous multi-track approaches that were time-consuming and expensive (Goold & Graham 2018). The completed track, including video of the performers recording, is available through the QR code on this page, and ideally should be viewed before or while reading.



“Reassemble” - *Trichotomy*, Final Produced Track [Multi-camera Studio Video]

Recording Jazz

Jazz performances often feature spontaneous interactions between musicians, interplay with the audience, the venue, and the creation of an ephemeral social and musical experience. The improvised nature of the music suits a live setting, where both the musicians and audience members can feel the music more intimately than on a recording. In these performance settings, musicians engage with the space and work with their performance materials to create an engaging dialogic event (Jackson 2012). It may be easy to perceive that a jazz recording is inferior to the live experience; in that, a recording does not accurately capture or represent the true nature of the performance. It only represents one moment, or ‘take’ of the music, a partial representation of the music (Reynolds 2017; Schulling 2019). However, this does not present a complete understanding of the function of the recording for musicians and audiences. Alongside this perceived inadequacy, jazz musicians use recordings to create highly detailed and accurate fixed representations of their work or even an enhanced version of the live experience; these recordings serve as another mode of performance expression and form a critical part of their improvised music-making skill-set.

Jazz recording techniques have changed significantly since the classic Rudy Van Gelder Blue Note recordings of the 1950s. Van Gelder modified the famed Neumann U47 microphone so that he could place the microphone closer to the performers, conveying more detail in the recording – developing a new standard practice (Crooks 2012). For many jazz styled recordings, the ideal recording experience can be to create an accurate sonic representation of the performance (Jago 2013) – as opposed to a recording that is not reproducible live – while configuring the studio space to capture the musicians playing in a natural way. Zagorski-Thomas (2007) recalls recording jazz musicians in studio settings where they wanted to ‘play in an environment that afforded as much interaction as possible’; so the listener can hear the music as real as it could be, free from the technological intervention of the studio (p. 202).

Reynolds (2017) undertakes a thorough analysis of the process for jazz recording, production and release of the music, using extensive case studies of musicians in New York from the 1980s through to 2017. He outlines how many contemporary artists ‘use recording technologies as instruments of music-making unto themselves, which can and do allow them to make music distinct from that which is or can be performed live’ (p. 129). Saxophonist Ben Wendell notes that recording allows you to produce ‘the music in a way that you couldn’t actually recreate live, whether it be with different effects through plug-ins, whether it be through overdubbing and layering or manipulating the sounds of the instruments’ (Wendell cited in Reynolds 2017, p. 131). Artists such as Marcus Strickland, Mark Guiliana, Donny McCaslin and Remy LeBouf note varied processes for their album recordings, moving between using electronic programmed elements as bed tracks, then overlaying various acoustic instruments, samples, and other recorded parts often recorded in different places at varied times (ibid). These studio techniques, although they may appear contrary to traditional jazz recording ideals, are not new. Lennie Tristano’s self-titled album released in 1956 involves the pianist recording multiple layers of piano parts, recording new piano tracks over existing rhythm section material, and added effects such as tremolo and echo (Jago 2013, p. 3). Pianist Bill Evans’ 1963 album *Conversations with Myself* also employs multi-tracking of improvised parts, with Evans recording layer upon layer of improvised parts.

Live electronics involves transforming the performers' acoustic sound in real-time. Klein (2008) clarifies the process noting, 'the poetics of live electronics reflect a desire to extend human musical capability by transforming the performer's sound with technology' (para.30). The inclusion of electronics alongside acoustic improvisation has been present since the late 1960s, with European free-improvisation groups AMM and Music Improvisation Company often cited as groups that blended jazz performance techniques with an array of unexpected electronics sounds into the performance (Borgo 2011). Although, the free jazz approach of these groups is not comparable to the post-production capabilities of a studio or mixing engineer. Lexar (2012) considers how 'technology used in performance extends the listening experience by introducing new sounds or unheard combinations of sounds through an exploration of the sonic potential and characteristics of the employed devices' (p. 11). This is a complex task, however, as Lexar reminds us, combining electronic and acoustic sounds complicates the role of the performer in negotiating these varied sound worlds.



Figure 1 - Sean Foran (Piano) and Samuel Vincent (Bass) during a live performance

Croft (2007) presents some paradigms of how electronic sound can interact in live performance, most specifically his 'instrumental' paradigm, the 'attempt to create a composite instrument' (p. 62). Croft stipulates that the performer should play the instrument-plus-electronics in a way somehow analogous to how they would typically play the instrument alone (ibid).

Evan Parker elaborates on the notion of creativity and interaction between musicians and the electronics, noting that the 'relationship between technological affordances and creative intentions can become even more involved in the context of a group performance ... there's a kind of uncertainty about whether that was the first time that sound happened, or "Did I miss it the first time and that's a replay of a sample of the first time?"'(Parker as cited in Borgo 2011, p. 6).

The Role of the Jazz Producer

Howlett (2009) defines the role of producer as one who uses the technology of music recording to mould an artists' potential song into a fixed product. Zak III (2001) identifies the common aspects of this varied role as the 'ability to draw together diverse elements and to manage the dynamics of collaborative creativity among members of the recording team' (p. 173). Anecdotally, many producers have described their role using a wide variety of descriptors in an attempt to capture this dynamic and challenging task (see Burgess 2002). In jazz recordings, the role of the producer aligns with these notions, with the elements of composing, tracking and post-production muddled (Reynolds 2017, p.135). Producers in modern jazz are using studio technologies as pathways for further creative elements, bringing in programmed effects, overdubs and spliced audio (ibid). Despite these contemporary depictions of 'extended studio techniques', historically, jazz recording in this manner was not always celebrated or considered authentic jazz (Jago 2013; Reynolds 2018). Schmidt-Horning (2013) describes a Thelonious Monk session where fundamental studio processes impede the spontaneity of an improvised recording session. The accepted approach developed by the jazz producer was self-effacing and non-intrusive to give the impression that 'studio trickery' was not employed (Reynolds 2018). Recordings such as Kurt Rosenwinkel's Heartcore – produced by hip-hop producer Q-Tip in 2003 – began to change the aesthetics of jazz production (ibid). Reynolds' analysis shows that jazz production has adopted every production tool currently available, including those of live acoustic manipulation. The jazz community can interpret recording as embodied music-making, where live performance and studio techniques are combined (Solis 2004), with producers occupying an important role in the creative process (ibid).

Methodology – Research Design

Technologically enhanced performance techniques as outlined by Knowles and Hewitt (2012), consider performance and recording practices as converging towards each other in contemporary music. Studio production techniques are used in live performance, such as digital sampling, loopers and live processing; and a reverse flux is evident, with these live performance practices being re-adopted in the studio production and performance practice (ibid).

However, in this instance, the group are not looking to create a studio recording that is unreproducible live. In this case, the musicians aim to create a recording using specific modern technological performance practices live in the studio; where the studio environment can provide the best possible representation of the live music – similar to the way the musicians may create the music in a live concert setting. Throughout this research, the producer's practice involves engineering, mixing and production (excluding mastering) to create the finished recording. The producer aims to capture the recording as honestly as possible and use mixing to highlight the most interesting improvised sections of the performances.

Drawing on a practice-based approach, there is a clear focus in this research on performer reflections in and on action, as noted by Schon (1983). Bryman's (2012) approach, whereby the authors are engaged and participate in and on the practice-based research with additional participants, observe the participants in naturalistic scenarios, and use interviews and field notes to assist in interpreting the attitudes of all the participants is utilised. Further to this, the actual artistic practice – or the musical performances & recordings – carry the musical artistic representation of the research in its most complete form.

The process for this research was structured as follows:

1. *Planning*

This consisted of deciding how many tracks would be recorded over a single day, where the recording would occur, equipment required, and intended outcomes.

2. *Recording*

The recording space used was the drummer's home studio, an environment used by the band for regular rehearsals. The intention is for the recording to be created with the musicians under the same constraints – the same improvisational demands – as they would have been in a club or concert setting (Jago 2013).

3. *Artist Reflection - recording*

Upon completion of the recording, the musicians engaged in self-reflection of the recording process. This reflection occurred in the subsequent days to preserve each musician's thoughts from the recording session. These semi-structured interviews are improvised in nature, with the participant musicians able to draw out observations and thoughts about fluidly recording the music.

4. *Post Production - mixing*

After the recording session, the track 'Reassemble' was chosen by the band to be mixed by the producer in his home studio. The musicians recorded one take of this work in the studio, with no edits or overdubs recorded. The producer also completed field notes on the recording and mixing process, to be examined alongside the reflections from the musicians

5. *Reflections - the produced track*

After the delivery of the produced track, the band engaged in another open-ended interview reflecting on how the final work had changed from the original live-recorded sound. Parallel to this, the producer also reflected on their contribution to the finished work.

The process outlined enables the artists and producer to engage in a recording scenario that is naturally part of the participant's lived experience. Naturalistic design is 'accessible, transparent, and transferable' and gathers data through 'real experiential activity' (Gray & Malins 2016). Interviews and field notes give us a 'rich descriptive

account' to understand the context, activities and actions during the recording from multiple perspectives (Watson & Till 2010 p.7). This methodology builds a qualitative framework for us to test the agency of the producer under these new studio conditions.

Artist reflections on the recording process



Figure 2 - Sean Foran (Piano) and Samuel Vincent (Bass) during the recording session

The recording environment for this session featured a carefully constructed sound setup for the performers (see Figure 2), as compared to the setup at a live performance environment, such as a club. However, the environment is a home studio, so has significant limitations in size, space and availability of equipment. The performers adjusted their headphones to hear an optimum balance between the acoustic and electronic sounds from each player. Drummer John Parker (Figure 3) articulated:

I think that because I could hear everything that was going on, I was able to mess with the effects and treat them more subtly, just like how we would play in a completely acoustic manner. We'd be able to hear all these things going on, and we would change the way that we play accordingly because of that.

Bassist Sam Vincent concurred with the importance of the sonic clarity in the recorded environment, observing:

I liked how I was really hearing dynamics. So I'm hearing someone doing something, and then I can really hear what they're doing you know, then I can get out of the way of that or I can interact with that.

Co-author Foran, notes that the songs seemed to have a strong shape to them:

the tracks have a certain succinctness when we're in the studio ... there's some more focus and care to the sounds; it's just such a different environment to the gig that I think we play differently, well at least, I do.

Drummer John Parker connects to this concept by reflecting that:

I think when I step into the studio situation, I try to play a little bit more thoughtfully or conservatively just because you're recording this and you want it to be quite pristine and correct and a little bit less crazy going for it, unlike when I'm doing a gig'.



Figure 3 - John Parker (drums) during the recording session, with Lachlan Goold (producer) at the desk

In this recorded situation, the performers have the immediacy of the live performance environment coupled with the sonic control present in a studio situation. The control the performers have over their performance – that of acoustic sounds and manipulated electronic sounds – gives them a higher degree of agency in the recorded outcome than usually encountered in the studio. As the musicians have been able to craft production effects live during the recording session, there is less need for the producer to add these manipulations later. These live electronics are creating a produced sound in the live moment.

Producer's Reflection Recording

Before recording commenced, informal pre-production meetings took place between Sean Foran and Lachlan Goold to discuss the technical specifications of the recording session. *Trichotomy* is a contemporary improvising group, and the need for a formal pre-production meeting was dismissed. Additionally, Goold was not involved in the initial studio setup. Goold states '[b]eing a small "at home" facility meant there were many parts of the setup esoteric to the studio, as the studio does not usually cater for outside engineers or producers' (fieldnotes, 3/02/19). Goold's field notes also add, '*Trichotomy* is not the type of band where I would offer a lot of arrangement advice. I would more likely try and set up the best possible scenario to capture the performances live' (fieldnotes, 3/02/19).

For the recording, Goold added microphones from his collection to Parker's collection, and Parker ran Goold through the signal flow of the studio. Overall the recording session ran quickly and smoothly, but Goold reported, 'I didn't feel connected to the performances' (fieldnotes, 3/02/19). Without prior knowledge of the pieces, Goold had little emotional connection to the music as it was hurriedly recorded. Howlett (2020) argues that improvised forms such as jazz have little need for thorough pre-production. Functionally, there were other issues that will be easily rectified in the post-production phase, such as the sound of effect pedal toggle switches and the adjustment of some effect levels by the performers during the performance.



Figure 4 - Samuel Vincent (Bass) and John Parker (drums) during the recording session

Artists' Reflections on the Recording Session

We've previously discussed the role of producer in contemporary jazz recording, in a situation such as this, where the band has a clear sonic sense, the producer can work alongside the band in a way that enhances the existing music. As bassist Sam Vincent mentions:

I would have thought that he [Goold] wouldn't go too crazy. I mean, yes, like you said, producers who bring arrangements and other instruments and stuff – I didn't think he was going to do that, that he would try and record us as best he could and then do some pretty subtle stuff I imagine, because of the situation where we as a band have a pretty strong idea of what we're doing.

The final mix of the work 'Reassemble' features no additional overdubs, or spliced audio from alternate takes or additional recorded material. The producer knew tacitly not to add material, or change elements, but rather to use their experience and best intuition to craft the recorded sound into a finished work. The band noted that the final produced track was "much clearer" (than the sounds they heard in the performance) and that the instruments had a greater sense of space and clarity around them – the detail in the parts played by each musician was clearly audible throughout the track. Additionally, some electronic elements could be heard that were previously lost in the live sound. The structure and interaction between the acoustic sounds and electronic sounds have not changed, and from the perception of the musicians, it did not need to. The producer in this situation has not altered the musical elements, but rather, clarified and improved the musical result that the musicians had constructed.

Instrument	Artist applied effects	Engineer post-production technique	Final sonic outcome
Drums	<ul style="list-style-type: none"> Delays added to the snare drum. Looped and layered drum parts with delays. Distortion on drum kit. Time stretching of drum loops. 	Add additional delays to create a wider delay image.	More depth to Parker's improvised delays.
Bass	<ul style="list-style-type: none"> Flange style effect on melodic bass lines. Looped bass phrases. Time modulation to looped phrases. Pitch modulated looped phrases. 	Reamped the clean Bass Di with an amp simulator to create a warmer, larger sound than what was captured in the studio. I then replicated all of Sam's effects and blended that with the live performance.	This created a fuller sound.
Piano	<ul style="list-style-type: none"> Gesture controlled harmonic filtering. Looped piano phrases (layered). Additional reverb. Cascading delays. Reversed piano samples. Time modulated piano samples. Pitch shifting. Phaser. 	I automated the volumes between the acoustic piano sound and the Ableton/Hardware outputs.	This created scene changes in the parts.

Table 1: Effects utilised by performers and producer.

As seen and heard in the video recording (see QR code), many of the subtle electronic sounds that for the musicians were originally lost in the live moment are now clearer and carry a new sense of prominence in the music. The artist's intention at the moment is more fully realised, and through the work of the producer, the greater potential of the music is constructed for the listener.

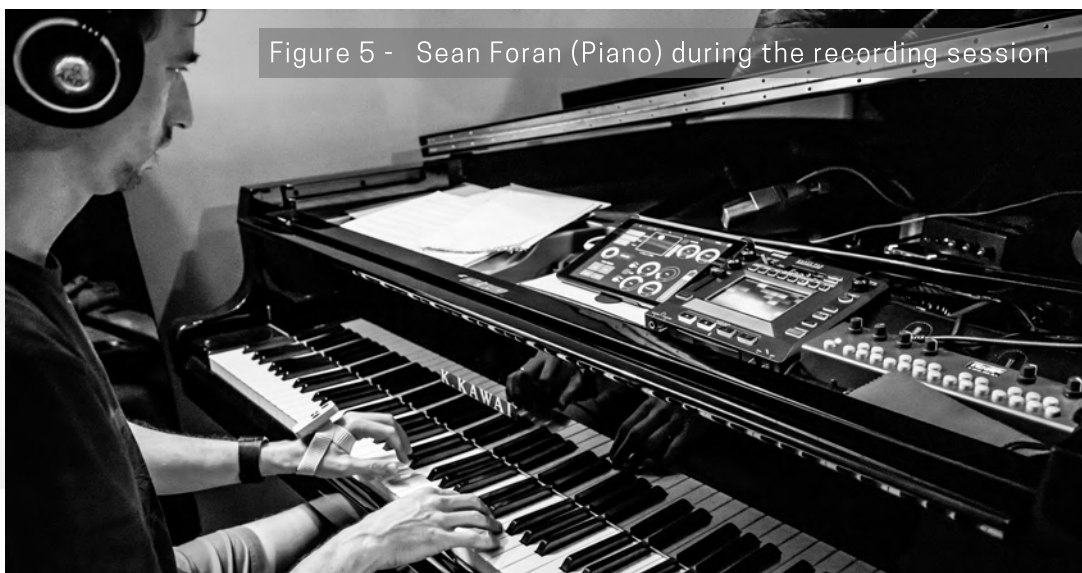


Figure 5 - Sean Foran (Piano) during the recording session

Producer's Reflection on the Mixing Process

Anthony (2017) posits that 'mixing is more than the sonic refinement of audio signal – it also involves a creative process (mixing as a performance) that satisfies the mixer's musical and emotional connection to the song' (p. 1). From a mixer's perspective, Goold found a connection to the recording through the mixing process, stating that:

[o]verall, I enjoyed mixing more than recording and engaged with the track better. I used the effects the band generated at a "starting point" and tried to allow the artist's effects to take the lead. (Fieldnotes, 3/03/19)

In that same manner that Solis (2004) postulates, Goold was enhancing the sound created in the recording. The performers live sound already had been heavily manipulated, and the mixing process was looking for more clarity and depth. To do this, Goold used a combination of effecting the performer's effect track further, or mimicking the effect track on the clean acoustic tracks, thereby replicating the artists' intention with a more considered result.

As noted in Table 1, the production on the drums involved adding delays to the existing delay tracks to provide greater width to the stereo field. However, the bass required a different approach as Goold's field notes state: '[t]here always seemed to be a compromise between hearing Sam's [Vincent] effects and the bass sounding good' (fieldnotes, 3/03/19). Due to this, Goold mimicked Vincent's effects on the acoustic microphone tracks. There is a considerable amount of drum spill into this microphone, but Goold felt this added to the overall effected and manipulated nature of the recording - an unintended benefit from this approach. Similarly, Goold preferred the acoustic microphones on the piano, as opposed to those that were manipulated by Foran through Ableton. Goold's fieldnotes elucidate that he was 'favouring the clean mics when there were no effects, and then turned up the effects [tracks] when Foran was manipulating the sound (fieldnotes, 3/03/19). We believe that this combination of adding to the performer's effects, recreating their effects, and changing the balance between the effected

and unaffected tracks created a unique balance. As a mixing engineer, Goold had more agency over the production in the mixing process as opposed to mixing the song without being involved in the recording process. Additionally, despite the artists being able to treat, manipulate and 'live produce' their recording, the ability to craft a well-balanced mix goes beyond the knowledge scope of these artists.

Conclusion

In creating this recording the musicians have been able to quickly and efficiently create a 'produced' sound in a live context. This process can also create a strong 'artist controlled' production perspective, which is generally the goal of recording, but a producer is often required to facilitate this process. The same artistic outcome can occur without the musicians implementing the effects live and is required for those inexperienced with technology in the studio. Leaving the process of sonic manipulation solely to the producer in post-production would take more time, but potentially craft a more controlled result with a greater variety of sonic possibilities not available to the musicians live. The inclusion of the effects live in this instance, however, lends itself to the improvised nature of the music, and for a modern jazz recording, represents an authentic recorded outcome; a true live recording of the music, but with post-production styled elements embedded into the performance. Replicating the same setup in a professional studio with more time would be the ideal scenario and potentially create a heightened degree of sonic control, enabling greater improvised options for the musicians in the tracking process and a wider variance of acoustic and electronic interactions in the music. In this scenario, while the producer is relegated to a technical role during the recording process, the mixing process enables the producer to embellish the performer's pre-manipulated sounds and extend those to create an artefact beyond what the artists could achieve in isolation.

Dr Lachlan Goold is a recording engineer, producer, mixer, popular music educator, researcher and lecturer in Contemporary Music at the University of the Sunshine Coast. His research focuses on practice-based music production approaches, theoretical uses of space, and the music industry, specifically relating to government legislation. In his creative practice, he is better known as Australian music producer, Magoo, a two-time ARIA award winner. Since 1990, he has worked on a wide range of albums from some of the country's best-known artists, achieving a multitude of Gold and Platinum awards.

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Sean Foran is a composer & pianist active in jazz and improvised music styles. He works primarily with the groups Trichotomy and Berardi/Foran/Karlen and has received the prestigious Brisbane City Council's Lord Mayors Emerging Artist Fellowship, AMC/APRA Award for Excellence in Jazz & APRA/AMC Professional Development Award for Jazz. His research focuses on practice-based approaches to the intersection of acoustic improvisation and live electronics in performance and production scenarios. He is currently Head of Music at JMC Academy Brisbane, Doctoral Candidate at Griffith University, Board Member for the Wangaratta Jazz Festival and Jazz Councillor for Music Australia.

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References:

Anthony, B. 2017, 'Mixing as a Performance: Creative approaches to the popular music mix process.' *Journal on the Art of Record Production*, 11.
<https://www.arpjournal.com/asarpwp/mixing-as-a-performance-creative-approaches-to-the-popular-music-mix-process/>

Borgo, D. 2011. 'The Ghost in the Music: Improvisers, Technology, and the extended mind.' *Society for Electro-Acoustic Music*.

Bryman, A. 2012. *Social Research Methods* (4th edn). Oxford: Oxford University Press.

Burgess, R. 2008. 'Producer Compensation: Challenges and options in the new music business.' *Journal on the Art of Record Production*, 3. <https://www.arpjournal.com/asarpwp/producer-compensation-challenges-and-options-in-the-new-music-business/>

Crooks, J. 2012. 'Recreating an Unreal Reality: Performance practice, recording, and the jazz rhythm section.' *Journal on the Art of Record Production*, 6.
<https://www.arpjournal.com/asarpwp/recreating-an-unreal-reality-performance-practice-recording-and-the-jazz-rhythm-section/>

- Goold, L. & Graham, P. 2018. 'The Uncertain Future of the Large-Format Recording Studio.' *Referred Proceedings of the 2017 Art of Record Production Conference*, Royal College of Music, Stockholm pp. 119-136.
- Howlett, M. 2009. *The Record Producer as Nexus: Creative inspiration, technology and the recording industry*. Doctoral Thesis, University of Glamorgan.
- Howlett, M. 2020. 'Pre-Production.' In A. Bourbon & S. Zagorski-Thomas (eds), *The Bloomsbury Handbook of Music Production*, pp. 177-186. New York: Bloomsbury Academic.
- Jackson, T. 2012. *Blowin' the Blues Away: Performance and meaning on the New York jazz scene music of the african diaspora*. Berkley, CA: University of California Press.
- Jago, M. 2013. 'What is a Jazz Record Anyway? Lennie Tristano and the use of extended studio techniques in jazz.' *Journal on the Art of Record Production*, 8. <https://www.arpjournal.com/asarpwp/what-is-a-jazz-record-anyway-lennie-tristano-and-the-use-of-extended-studio-techniques-in-jazz/>
- Kealy, E. 1979. 'From Craft to Art: The case of sound mixers and popular music.' *Sociology of Work and Occupations*, 6 (1), pp. 3-29.
- Klein, J. 2008. *Voice and Live Electronics: A historical perspective*. Doctoral thesis, McGill University, Montréal.
- Knowles, J. & Hewitt, D. 2012, 'Performance Recordivity: Studio music in a live context', *Journal on the Art of Record Production*, 6. <http://www.arpjournal.com/asarpwp/performance-recordivity-studio-music-in-a-live-context/>
- Lexer, S. 2012. *Live Electronics in Live Performance: A performance practice emerging from the piano+ used in free improvisation*. Doctoral thesis, Goldsmiths, University of London.
- Nicholson, S. 2003. 'Jazztronica: A brief history of the future of jazz'. *Jazz Times*, 1 March 2003. <https://jazztimes.com/features/profiles/jazztronica-a-brief-history-of-the-future-of-jazz/>
- Reynolds, D. 2017. *Jazz and Recording in the Digital Age: Technology, new media, and performance in New York and online*. Doctoral thesis, City University of New York Graduate Centre.
- Reynolds, D. 2018. 'Song, Beat, Sound, and Solo: Production, musical style, and a recording-oriented aesthetic of jazz'. *Jazz Perspectives*, 11(2), pp. 111-138.
- Schön, D. 1983. *The Reflective Practitioner: How professionals think in action*. Burlington, VT: Ashgate Publishing.
- Schmidt Horning, S. 2013. *Chasing Sound: Technology, culture, and the art of studio recording from Edison to the LP*. Baltimore, MD: Johns Hopkins University Press.
- Schuling, F. 2018. 'Jazz and the Material Turn.' In N. Gebhardt, N. Rustin-Paschal and T. Whyton, *The Routledge Companion to Jazz Studies*, pp. 87-96. Abingdon: Routledge.
- Scott, A. 1999. 'The Cultural Economy: Geography and the creative field.' *Media, Culture & Society*, 21(6), pp. 807-817.
- Solis, G. 2004. '"A Unique Chunk of Jazz Reality": Authorship, musical work concepts, and Thelonious Monk's live recordings from the five spot, 1958.' *Ethnomusicology*, 48(3), pp. 315-347.
- Taylor, T. 2001. *Strange Sounds: Music, Technology and Culture*. New York: Routledge.
- Watson, A., Hoyler, M. and Mager, C. 2009. 'Spaces and networks of musical creativity in the city.' *Geography Compass*, 3(2), pp. 856-878.
- Zagorski-Thomas, S. 2007. 'The Musicology of Record Production.' *Twentieth-Century Music*, 4(2), pp.189-207.
- Zak III, A. 2001. *The Poetics of Rock: Cutting tracks, making records*. Berkley, CA: University of California Press.

