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Shaping Popular Music

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Overview

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- Aims
- Definitions
- Musical shaping
  - Performers
  - Role of performers, producers and technology in the studio
  - Use of recordings in live performance
- Summary

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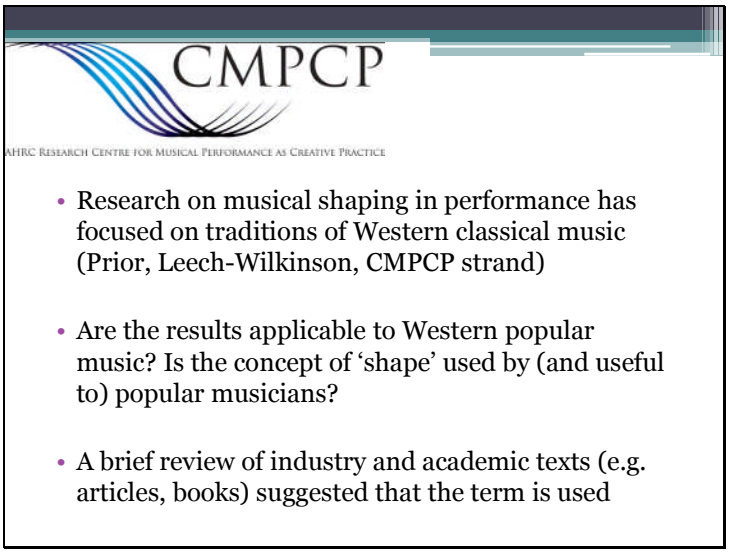

Research on 'musical shaping' carried out by Leech-Wilkinson, Prior and colleagues at Kings College London, as part of the Centre for Musical Performance as Creative Practice, has focused predominantly on the traditions of Western classical music. A key question is whether the findings of this research are applicable to Western popular music. Is the concept of 'shape' used by (and useful to) popular musicians?

We (Prior, Greasley) carried out a brief scan of relevant sources (e.g. magazines, reviews, autobiographies, articles, books) *in a similar vein to Prior's original study (which searched for the use of the term or idea of shape in relation to music, and uncovered a wealth of evidence from written, audio and video sources revealing the unprompted use of the term by musicologists, critics, choreographers, composers, and performers; mostly within the twentieth and twenty-first centuries, see (Prior nee) Daynes (2010a, 2010b*) and found that the term is also used in discussions of popular music. For example, in their book entitled *How to DJ: The Art and Science of Playing Records* (2002), Broughton and Brewster discuss 'Shaping your set' referring to how DJs might plan and execute their set during live performance (p. 133). Moorefield – composer, producer, sound artist and Professor of Music, wrote a book entitled *The Producer as Composer: Shaping the Sounds of Popular Music* (2005, paperback 2010) which describes the creative practices of producers who, he argues, have gone *beyond* the traditional role of 'capturing what happened in a live concert hall' and become 'auteurs' responsible for 'shaping' the musical outcome.

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Aims

- To explore notions of musical shaping in Western popular music drawing on:
  - Perspectives of popular musicians performing with different purposes in mind
  - Literature in the popular music field
  - Examining the role of the performer, producer and technology in the recording studio
  - Discussion of the ways in which popular music recordings are used in performance

Our aim was to explore notions of musical ‘shape’ or shaping in popular music, by examining the perspectives of the performer in live performances; the role of performer, producer and technology in recording studios; and the ways in which popular music recordings may be used in performances, focusing on DJs’ perspectives on musical shape.

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Setting the boundaries

"Only the most general definition can be offered under the general umbrella category of 'popular music'. Essentially, it consists of a hybrid of musical traditions, styles and influences, with the only common element being that the music is characterised by a strong rhythmical component and generally, but not exclusively, relies on electronic amplification. Indeed, a purely musical definition is insufficient, since a central characteristic of popular music is a socioeconomic one: its mass production for a mass, still predominantly youth-oriented market. At the same time, of course, it is an economic product that is invested with ideological significance by many of its consumers."

(Shuker, 2012, p. 6)

The term 'popular music' has been so widely used and defined that it is essential to begin with a brief discussion of the scope of the term as it pertains to our work. In distinguishing between folk, art, and popular music, Philip Tagg (1982) commented that popular music tended to be A) produced and transmitted primarily by professional musicians; B) mass distributed primarily through recorded sound (*cf.* Kania, 2008); C) a commodity in an industrialised society; and D) name composers/artists/authors. He also noted its general lack of written theory and aesthetics, though this has since developed (Bennett, Shank & Toynbee, 2006; Brabazon, 2012; Frith & Goodwin, 1990; Moore, 2001; Negus, 1996; Scott, 2009). A useful definition of popular music, and one that we will be adopting in the current chapter, is provided by Shuker (2012: p. 6): Quote on slide.

A common historical tendency to snub popular music (Middleton, 1995) is reflected by Frith (2001) who provides a more contentious definition, describing popular music as 'music accessible to the general public…it is music produced commercially, for profit, as a matter of enterprise, not art.' (p. 94). It is no wonder, perhaps, that popular musicians have responded to such statements with writings with titles beginning with '*The Art of …*', encompassing topics such as record or music production (Burgess, 2001; Frith & Zagorski-Thomas, 2012; Gibson, 2005; Moylan, 2007), sound engineering (Horning, 2004; Zak, 2009), and DJing (Broughton & Brewster, 2002; Katz, 2012). Shuker (2012) argues that there is an inherent tension between the essential creativity of the process of making popular music and its commercial nature, but most commentators agree that considerable skill is required by all contributing parties for commercial success. These titles highlight not only the array of technology used in the production of popular music (Théberge, 1997, 2001), but also the number of different people and skills required for success in popular music (McIntyre, 2012).

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Perspectives of the performer in live performances

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Popular musicians' responses

- Questionnaire study (Prior, 2010, 2012a)
- 200 respondents
- 25 provided specific examples of using shape when thinking or talking about popular music
- Range of instruments represented
  - Voice (5), guitar (4), piano (4), double bass (2), trombone (2), violin (2), also clarinet, euphonium, percussion, saxophone, turntables, conducting
- Range of genres represented
  - E.g. Jazz/Blues (13), Pop (9), Rock/Metal (5), Contemporary/experimental (4), World (4), Musical theatre (3) Country/Folk/Gospel (3), Urban (3)

Prior carried out a questionnaire study (Prior, 2010, 2012a) which provided some insight into popular musicians' perspectives on musical shape.

200 respondents

60% exclusively classical, 10% non-classical, 30% mixed

25 provided specific examples of using shape when thinking or talking about popular music

Range of instruments represented

Voice (5), guitar (4), piano (4), double bass (2), trombone (2), violin (2), also clarinet, euphonium, percussion, saxophone, turntables, conducting

Range of genres represented

E.g. Jazz/Blues (13), Pop (9), Rock/Metal (5), Contemporary/experimental (4), World (4), Musical theatre (3) Country/Folk/Gospel (3), Urban (3)

Three main themes were identified in the open-ended responses

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Overcoming technical difficulties

"I always explain the use of the voice to my students with … pictures of shapes. For a beginner it is usually difficult to sing high notes. What often helps them is imagining the tone as an arch that is streaming out of the top of their heads, like a rainbow. I also explain the process of breathing and singing as a circle that should not be disrupted … When I sing I always produce pictures in my mind to achieve a certain sound, tone quality or emotion … Low, warm tones, the ones that are used in Jazz Ballads I always see as dark blue bubbles or circles … high very powerful tones that are used often in Pop music, but also funk, often look like bright yellow or red triangles or just lines."

(Professional singer and teacher)

Firstly, a few performers described their use of shapes and images to overcome technical difficulties. Several singers described how shape was helpful for themselves and their students in achieving the correct pitch, tone colour and expression.

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Musical structure or trajectory

"Concentrating on the placement of one or more musical ideas and using space/duration to create contrast between them. A piece that has 'shape' could be said to arise through this process."

(Professional pianist)

"1) thought about the shape of my solo, started with short phrases with repetitive rhythm then extended the phrases 2) thought about form of the piece (AABC), where to place solos, how many solos, whether to have a "rhythm only" chorus, how to end the piece"

(Amateur saxophonist)

Secondly, the idea of musical shape was used, that is, in reference to a musical structure or trajectory.

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Musical expression

"How to craft phrases, the beginnings and ends of phrases, the swell of dynamics, minute tempo changes bar to bar"

(Professional standard euphonium player)

"Shaping the music, rather like a sentence in poetry. Use of dynamics to highlight the phrase. Reacting to new and unfamiliar acoustics."

(Professional standard percussionist, in this instance conducting a choir)

Thirdly, musical expression was used on a variety of scales, both in relation to the whole piece and more specifically in relation to individual phrases. Sometimes these ideas were discussed in specific technical terms, with reference to phrasing and breathing, dynamics and tempo fluctuations, all of which might vary according to the acoustic of the performance space.

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Ideas based in technology

- The role of technology in conceptions of musical ‘shaping’
  - Equalisation (e.g. DJ in the sample)
  - Visualisation of a performance using software programmes (e.g. Protools)

“Shape for me is simply a handy way to visualise what I hear. Use of 'shape' now extends more broadly to the use of software programs such as Protools where visualising a recorded performance will not only allow rapid editing, amongst many other things, but also gives a differing insight into things like song structure and arrangements - it also gives a deep insight into feel or groove.”

(Professional standard guitarist)

There were some technologically-based ideas of musical shaping.

Participants mentioned simple techniques such as ‘reverb’, ‘fading out’, as well as the use of previously recorded performances of improvisations to aid the creation of new improvisations. Two participants specifically mentioned mixing and equalisation.

Several participants with interests in record production discussed technologically-based shape related ideas when asked about ‘other links between music and shape’, as the quote from one professional guitarist illustrates. It is clear that the availability of computer programmes that display music and sound as waveforms have added a visual element to these participants’ understandings of musical shaping.

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Surprising omissions?

- Microphone use (Barthes, 1990; Grieg, 2009)
  - *Types* of microphones
  - Microphone technique
- Amplification (Theberge, 2001; Walser, 1993)
  - Extended techniques (e.g. distortion)
- Methodological considerations
  - Wording of questionnaire (with focus on performing)
  - Outcome if producers and engineers had also been recruited?

The role of technology in shaping popular music practices has been well documented (Cook, Clarke, Leech-Wilkinson & Rink, 2009; Frith, Straw & Street, 2001; Frith & Zagorski-Thomas, 2012; Gracyk, 1996; Katz, 2004; Théberge, 1997, 2001; Toynbee, 2000; Warner, 2003), yet only a small number of respondents referred to their use of technology in relation to musical shaping.

It is surprising, for example, that the singers in Prior's (2012a) study did not discuss the ways in which they use microphones to achieve certain vocal effects. Several texts have explored the role of the microphone in popular musicians' practices (Campbell, Greated & Myers, 2004; Frith, 2001; Greig, 2009; Horning, 2004; Théberge, 2001). As well as influencing popular musicians' use of specific instruments the microphone has shaped musicians' vocal style. Musicians have built up knowledge of the *types* of microphones available and how to employ these to help them to achieve particular expressive goals. For example, Greig (2009) notes that *pianissimo* can be produced not only by singing more quietly, but also by the addition of more breath than tone, making less use of the vocal tract, and moving the microphone away from the mouth. Regulating the distance between the mouth can lend warmth and grain to a vocal performance (Barthes, 1990; Frith, 1981; Théberge, 2001).

Amplification has also changed popular musicians' live performance practices (Frith, 2001; Théberge, 2001). Popular styles such as rock and heavy metal have adopted extended amplification techniques (e.g. distortion, feedback) which provide musical outputs distinctive to those styles (Poss, 1998; Théberge, 2001; Walser, 1993). None of the participants in the above research mentioned their use of amplification techniques.

The reason that so few mentioned technology may have been due to the nature of the methodology: questionnaires generally elicit shorter and less detailed answers than interviews. Equally, the wording of the questionnaire, with its (albeit deliberate) focus on performers and performing, may have influenced the types of responses given by musicians. Had the questionnaire been directed explicitly towards producers and recording engineers, more technologically-based conceptions of musical shaping may have been found.

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Comparison between classical and popular

Similarities

- 'Shape' as synonymous with musical structure
  - At a broad level: whole set or whole piece
  - At a specific level: phrase, melody, specific rhythm
- Shape as musical expression
  - Notions of contour, which were related to various musical features such as instrumentation, timbre
- Shape as means of working through technical difficulties

Differences

- Popular musicians gave slightly less positive responses to:
  - Using the notion of shape in rehearsals with others, and in informal discussions with other musicians
  - The idea of musical shape following the melodic line of the music, or moving from left to right – something that might reflect the lower dependence on the musical score in non-classical traditions (Prior, 2012a).

To summarise at this point, there were a number of similarities in the classical and popular musicians' ideas of musical shaping. This included the conceptualisation of shape as relating to musical structure, musical expression, and as a means of working through technical difficulties.

Furthermore, whilst the short quotations from the questionnaire responses may not be of sufficient length and depth to provide conclusive evidence of these ideas, the metaphorical, non-technically-specific nature of some of the comments hint at heuristic thinking which was found in the study with classical musicians; the mention of gesture by one participant may stem from a multimodal understanding of musical shaping; and the mention of personality in relation to musical shaping might relate to links between musical shaping and identity. At the very least, there is evidence that further study of popular musicians may reveal similar and equally interesting understandings of musical shaping to those used by classical musicians.

In terms of differences, musicians who played non-classical music (both exclusively and as well as classical music) gave slightly less positive responses to the idea of using the notion of shape in rehearsals with others, and in informal discussions with other musicians. They also gave slightly less positive responses than classical musicians to the idea of musical shape following the melodic line of the music, and to the idea of musical shape moving from left to right, something that might reflect the lower dependence on the musical score in non-classical traditions (Prior, 2012a).

The role of performer, producer, and engineer in the recording studio

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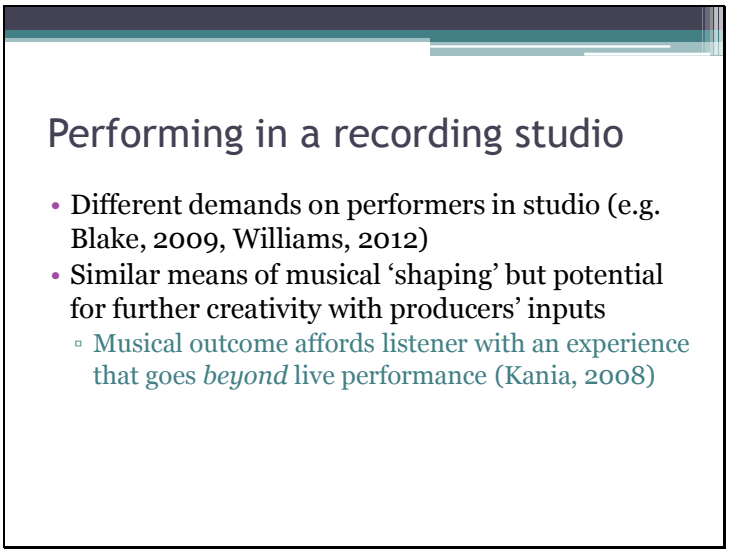

The demands of the recording studio with its customized environment and lack of audience require of performers a different understanding of musical performance compared to their usual live performance situation (Blake, 2009; Horning, 2012; Pras & Guastavino, 2011; Williams, 2012; Zak, 2009). Performers have responded creatively to both the technical restrictions (most of which are now historical) and the opportunities afforded by the studio environment, and have generated new performance techniques as a result (Doğantan-Dack, 2008; Cook et al., 2009; Frith & Zagorski-Thomas, 2012).

Many of the means of musical shaping at the disposal of musicians in live performance are of course available to them in a studio setting. However, there is further potential for performers to modify the sound they are producing to create – in conjunction with sound engineers and producers – an experience for the listener that goes beyond the possibilities afforded by live performance (Kania, 2008).

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Recording spaces

- Studio – with its dry acoustics and lack of natural light – can restrict artists' creativity (Gander, 2011)
- Use of headphones can have far-reaching consequences for social and musical interactions between performers (Williams, 2012)
- Performers have issues with technologically-mediated sound of their instruments
  - Differences in 'audioscapes' heard through headphones
    - Positive = enabling musicians to balance incoming signals
    - Negative = tension regarding overall contribution

The studio environment, with its more-or-less controlled acoustics, has the potential to influence decisions made by performing musicians. In the same way that (classical) music performers in a live setting will adjust their musical shaping to reflect the acoustics of the room in which they are playing, as demonstrated by Prior's work with classical musicians, for popular musicians too different recording spaces afford differences in sound quality and correspondingly different perceptions (Gander, 2011).

Gander argues that with its dry acoustics, its lack of natural light, and its own behavioural conventions, the studio can feel restrictive to some artists, who seek alternative, more 'natural' recording spaces in which they feel more creative. The dry acoustics and the sounds heard through the headphones highlight the detail of the musician's own part, as opposed to the sounds the performer will usually hear in rehearsal.

Williams' (2012) ethnographic research into recording studio practices (carried out from the perspective of a musician, engineer and producer) demonstrates that even the use of technology as seemingly straightforward as headphones can have far-reaching consequences for the social and musical interactions taking place between musicians performing together and between those musicians and engineers, which in turn will influence aspects of the final recording. Musicians (particularly vocalists) become dissatisfied with the technologically-mediated sound of their instrument as headphones remove the acoustics of their performance in the room that musicians use to control parameters of their sound (e.g. pitch, amplitude). There is a conflict between the idealised unmediated 'audioscape' performers strive for and the mediated headphone 'audioscape' they experience; musicians must contend with the difficult (and sometimes disorienting) task of situating their performance within two different auditory environments (Williams, 2012; see also Pras & Guastavino, 2011). Developments in personal headphone monitoring (which enables musicians to combine and balance incoming signals from other musicians' outputs individually) have afforded more agency to musicians, and in some cases have positive effects on their performance (some musicians report using the clarity with which they can hear their voice/instrument to refine their performance techniques). Yet there are still tensions when the producer's audioscape is replayed and there is a discrepancy between this and the tailored (headphone) audioscape musicians have created for themselves, particularly in relation to an individual's contributions relative to the whole (Williams, 2012).

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Recording spaces

- "…if I want someone to sing… again I don't tell them this, but if I want someone to sing a little bit more intimately, depending on the nature of the song, I will make the vocal much louder in their headphones so that naturally they'll just sing a little softer or with a different colour in their voice. And if I want them to sort of go for it a bit more, I keep pulling it back down so they almost feel they have to sing a bit more and sing out more."

  [William Wallby, in Gander, 2011, p. 134]

In the studio environment, performers relinquish some of their control to other personnel in the studio (e.g. the sound engineer, the producer). For example, producers can influence the sound quality of the performing artist by modifying the mix sent to the headphones of the musician. Gander (2011) notes the practice of a producer who describes modifying the levels of the vocal sound in the musician's headphones to influence the timbre of the sound that musician produces: (Wallby quote)

Producers do not always conceal their intentions from performers: Gander also describes a more collaborative scene in the recording studio, with discussion between performers and the producer leading to the modification of sounds and the selection of performances for the final recording (Gander, 2011, pp. 149–153).

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Tensions in the studio

- Miles Davis and producer Teo Macero
  - Miles argues the complexities of the arrangements were determined by him with the musicians
  - Teo maintains that the decision-making processes about which sections to edit/cut/splice were collaborative
- The relative contribution of performers vs. producers
  - A matter of record-by-record investigation (Frith & Zagorski-Thomas, 2012)

There can be tensions regarding the relative contribution of the musician(s) in relation to the engineer/producer.

Here we draw on an example from the *Pop, Rock and Soul Reader* (edited by Brackett, 2005) in which Miles Davis discusses the album *Bitches Brew.*

Davies argued that producer Teo Macero had 'nothing to do' with the decisions on the album *(quote: "some people have written that doing Bitches Brew was Clive Davis' or Teo Macero's idea. That's a lie, because they didn't have nothing to do with none of it."*) whilst Teo Macero maintained that the pair had listened to the many hours of takes *together* in order to make decisions about which sections to edit, splice and cut in the production of the final album (Szwed, 2002).

We agree with Frith and Zagorski-Thomas (2012) here, who assert that the role various parties play in shaping the musical product is a matter of record-by-record investigation.

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Technological devices and practices

- Mircophoning (e.g. Horning, 2004)
  - Number, type, and placement of microphones
  - "like a painter mixing colours from a palette" (2004, p. 710)
- Multi-track recording
  - Wide range of possibilities for the control and layering of sounds (Théberge, 1989, 2001)
- Level of abstraction
  - Engineers may shift from " a relatively atomic level of detail – refining individual sounds, specific areas of the frequency spectrum, or discrete moment in the performance – to a broader perspective taking in larger swatches of musical texture or narrative" (Zak, 2009, p. 71)

At a broad level, technological advances have played a fundamental role in the development of popular music (Théberge, 2001).

The microphone, for example. Horning (2004) maintains that 'the art of microphoning' is a skill which evolved as a natural progression from the recording engineer's placing of performers before the acoustical recording horn, and one which is acquired tacitly—by recording engineers and performers alike—through experience (see also Horning, 2002). Horning goes on to note that "some have likened this ability to 'get sounds' by careful choice of microphones to a painter mixing colours from a palette" (2004, p.710).

The increased role and responsibility of the engineer for achieving musical balance through careful placement of microphones led to the development of the multi-track studio which was instrumental in the development of popular and rock styles (Théberge, 2001).

Multi-track recording is central to the creation of popular music as it offers a wide range of possibilities for the control and layering of sounds (Théberge, 1989, 2001). It was first used in popular music in the 1950s and is characterised by the separate recording of multiple sound sources to different audio channels to create a recording. Sounds are "removed from the narrative and textural contexts in order to examine and refine their most subtle details" (Zak, 2009, p. 71) in order to perfect the final mix . This, Zak goes on to note, requires an approach by engineers which may shift from "a relatively atomic level of detail – refining individual sounds, specific areas of the frequency spectrum, or discrete moments in a performance – to a broader perspective taking in larger swatches of musical texture or narrative" (p. 71). It is perhaps unsurprising that producers have likened their role to that of an artist painting, given the need to switch focus between micro and macro level of detail.

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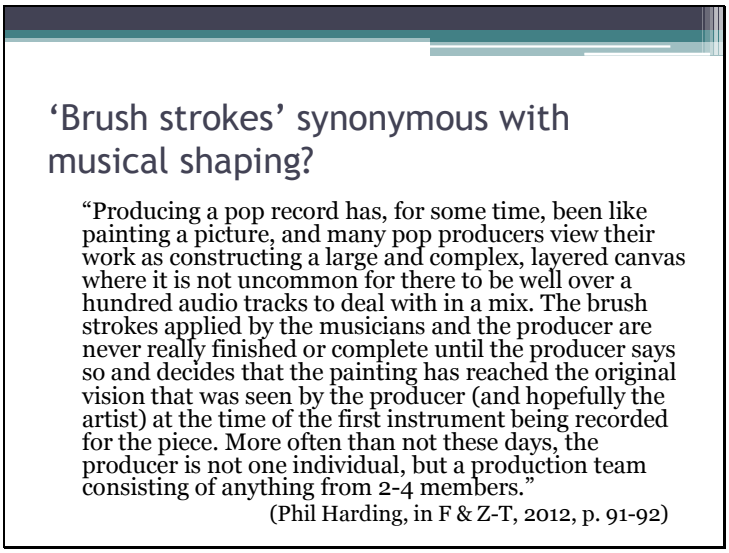

In his commentary on Frith and Zagorski-Thomas’ *Art of Record Production*, Phil Harding argues that (F & Z-T, 2012, p. 91-92): *Quote from slide*

The ‘brush strokes’ that Harding speaks of—arguably synonymous with musical shaping—are increasingly intricate and nuanced as a result of technological advancements. New multi-track recording technology gave enhanced power to the producers, and separate recordings of each track enabled a much higher level of musical accuracy (e.g. micro-timing and micro-tuning) than was previously achievable in live performance (Blake, 2009; Frith & Zagorski-Thomas, 2012). The number of audio tracks used in the mix gradually increased from forty-eight or sixty-four rather than twenty-four tracks. Nowadays, producers may be employing ninety-six track mixers to achieve the sounds they desire, affording them greater artistic control and flexibility.

Gander (2011) argues that this increase in audio tracks isolates performers from their performance and each other, empowering the producer, and this is reflected in producers’ accounts of their work. E.g. Phil Ramone (*American producer, recording engineer, violinist and composer – nominated for 33 Grammy Awards)* (p. 186) in his autobiography, “the mixing engineer is the star of the record-making process – an artist in every sense of the word”

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Advances in sampling and computer-based sequencing

- Signal processing
  - E.g. reverb, delay, chorus, flange, compression
- Musical Instrument Digital Interface (MIDI)
  - Enhanced control over layering of sounds

Accompanying these advances in multitrack recording techniques have been advances in sampling and computer-based sequencing, including signal processing, MIDI sequencing and digital sampling (Blake, 2009; Katz, 2004; Théberge, 2001, Warner, 2003).

Signal processing enables producers to add special effects (e.g. reverb, delay, chorus, flange, compression) to tracks to create more varied and complex sounds.

MIDI sequencers—which enable the operation of synthesisers, samplers, signal processors, mixing desks and computers through a single interface—facilitate enhanced control over layering of sounds. Using MIDI technology, musical outputs can be edited in a variety of ways (including pitch, rhythmic accuracy, duration, timbre and articulation) and then combined with musical output on different channels to build complex musical arrangements (Warner, 2003). There is a high level of flexibility over the musical output, and producers can manipulate a wide range of musical parameters creatively.

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Advances in sampling and computer-based sequencing

- Digital sampling
  - E.g. Amen break (cut, looped, reversed)
- Remixing and 'mash-ups'
  - Elements of tracks are re-ordered, re-balanced and re-contextualised
  - E.g. Avalanches – Frontier Psychiatrist

Digital sampling encompasses the inclusion of any pre-recorded sound into a new recorded work, and the sample itself can range from a minute segment (e.g. fraction of a waveform, a single note from an instrument or voice) to longer segments (e.g. rhythm, melody, harmony, several bars) and these can "be used to manipulate, extend, and/or condense the *structure* of a song, as well as its texture, arrangement and timbre" (Goodwin, 1990, p. 271).

These sounds can be altered in a variety of ways: for example, they can undergo tempo and pitch shifts, be reversed, cut, looped and layered, and frequencies within the sound can be emphasised or reduced (Katz, 2004). One only needs to think of the 'Amen' break—a four-bar drum solo performed by Gregory Coleman in the 1960s song *Amen, Brother* which has been used extensively in a range of electronic music styles such as breakbeat, hip-hop, hardcore, jungle and drum and bass (Butler, 2006)—to realise the potential for the creative use of samples. Goodwin (1990, p.261) argues that Digital sampling enables "the manipulation and reproduction of sounds within almost infinite parameters and no discernible loss of sound quality" (Goodwin, 1990, p.261) and that the creative possibilities it offers are nearly limitless (Goodwin, 1990; Katz, 2004).
Amen break: http://www.youtube.com/watch?v=qwQLk7NcpO4

Furthermore, with remixing and mash-ups, elements of tracks are re-ordered, re-balanced and re-contextualised (see Moorefield, 2005, 2010).

Covers
    Re-recording of existing song in new style
Mash-ups
    Blending different recordings, often from different genres
    E.g. Avalanches *Frontier Psychiatrist* (made up using thirty samples from other records)
        http://www.youtube.com/watch?v=U8BWBn26bX0

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Studio as 'instrument'

- Studio as 'creative tool' (Hennion, 1989; Moorefield, 2005; Zak, 2009)
  - E.g. Brian Eno's work with U2 creating new songs and overdubbing parts to add to the richness of the final mix (see Blake, 2009)

A common theme throughout the literature is the conceptualisation of the 'studio as instrument' or 'studio as creative tool' (Blake, 2009; Hennion, 1989; Horning, 2012; Zak, 2009). Focusing on the day-to-day activities of a producer, a recording artist and a musical director, Hennion (1989) put forward the notion of the 'studio as laboratory for experimentation' in which achieving recording success stemmed from a series of trial-and-error processes, and the release of several singles could act as several experiments in the lead-up to the broader experiment of an album. The sense of exploration and experimentation afforded by the studio is supported by accounts of, for example, Sam Phillips's work with Elvis Presley in the 1950s (Zak, 2009), Phil Spector's work with The Ronettes in the 1960s (Thompson, 2010), and Brian Eno's work with U2 in the 1980s (Blake, 2009).

Blake distances the work of Brian Eno (see Eno, 1996; Tamm, 1990) from the work of the Stock, Aitken and Waterman (see Stock, 2004) production team (which he describes as 'formulaic'), arguing that the band were actively encouraged not just to perfect existing songs, but to "use the studio as an instrument, improvising in the creation of new songs and overdubbing parts to add to the richness of the final mix" (2009, p. 48). It is particularly interesting, Blake notes, that in order to replicate the complexity of sound achieved in the studio, U2 had to start using pre-programmed sequencers as backing to their stage performances, thus using their creative practice in the studio to inform their live performances.

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Using popular music recordings in live performances

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Insights from one disk-jockey (Prior, 2012a)

- Female DJ
  - UG and PG musicology degrees, violinist and pianist but described turntables as her main instrument
- Descriptions of using musical shaping
  - Solo performance (mixtape)
  - 'back-to-back' DJ set (nightclub)
- Focus on planning performance
  - Overall shaping (e.g. record selection, order)
  - Transition between tracks (e.g. equalisation)
  - Use of metaphors (e.g. trajectory, contour, energy)
  - Descriptions of set 'shapes' (e.g. alternate high and low, arch shape)
  - Mixing style (e.g. choppy, smooth)

The questionnaire study mentioned above (Prior, 2012c) received a single response from a practising DJ, whose responses to the open-ended questions provided food for thought. Her responses to questions concerning her experience of music and shape focused on a solo performance (making a mixtape) and a 'back-to-back' DJ set (in a nightclub) and both experiences referred to had occurred in the four months prior to her completing the questionnaire.

Both episodes involved planning a performance and the choice of tracks involved, rather than the act of performance itself. This might be likened to a classical performer choosing a programme for a concert. Interestingly, this participant related the overall shaping of a set (on both the occasions described) to the energy level of the tracks played. There is a desire to consider the overall contour of a mix and a desire to maintain interest for the listener or audience (in the case of the nightclub performance). This too is a useful concept for classical musicians, who in the interview study (Prior, 2012b) often discussed the overall contour of a musical work with several movements, and gestured to indicate the energy levels implied within those movements. The DJ also discusses the manner in which she could make a transition between tracks as part of the musical shaping, an idea that emphasizes her role as a performer in creating a desirable set. She related shape to space, discussing both the acoustics of a particular room and the appropriateness of a track for that space, and her manipulation of the equalisation (EQ) of tracks to make them blend, which as she commented, 'means thinking in terms of frequency space, often on an up/down or left/right scale'. With the exception of the specific technical discussion of equalisation, these comments were similar to those made by classical musicians in the interview studies, who discussed tempo, timbre, thickness of texture and harmonic features as influencing the musical shape.

While the responses of this single questionnaire respondent are interesting and insightful, she represents just one view of the importance of shape in relation to music. In addition, her exposure to musicology and classical practices through her degree courses and performance on the violin and piano may also have influenced her ideas concerning music and shape, even when she relates her views in relation to her practice as a DJ. For these reasons, we undertook an interview study of the ways in which DJs use the idea of shape or shaping in relation to music. It was hoped that a more in-depth study might allow insight into DJs' practices and a comparison with the findings concerning classical musicians outlined above.

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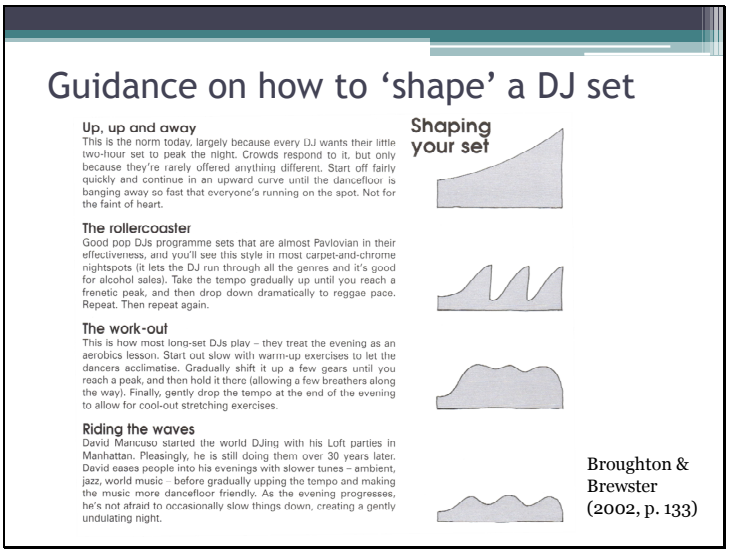

The ways in which she described building sets is similar to the guidance provided by Broughton and Brewster (2002) in their book *How to DJ Properly*, for encouraging and controlling the energy on the dance floor (see Figure). The authors argue that a DJ's choice of what records to play, and in what order, is central to shaping a set, and that mood and tempo are integral to this. The specific 'arch' shape mix she refers to ('a mix that gets more and more peaky towards the middle and then tapers off towards the end') has been previously noted by Spring (2004) who argued that a 'typical' set "begins softly and builds to an intense peak and then mellows out to bring the dancers down and signal the set's end" (p.50).

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Methodology (Greasley & Prior, 2013)

- Taken from Prior's study with violinists and harpsichordists
- Three DJs
  - Varying styles, two were scratch DJs
- Identification of unfamiliar tracks
- Three performances
  - Typical approach, with shaping, without shaping
- IPA analysis
  - Two stages of coding
  - DJ comparison

We conducted an interview study exploring DJs' perspectives on musical shaping (Greasley & Prior, 2013). Using a similar methodology to the interview study with classical musicians mentioned above (Prior, 2012b), DJs were asked to perform a short mix in three conditions: first with unfamiliar records; second (with the same records) thinking about musical shaping or the shape of music; and third (again with the same records) *without* musical shaping. The first author visited the DJs in their homes, and they performed on their usual equipment (i.e. decks and mixer set-up). Responses given by the three male DJs were then compared to the responses of a single female DJ to the questionnaire study (Prior, 2012a) to explore similarities and differences in the DJs' perspectives on musical shaping.

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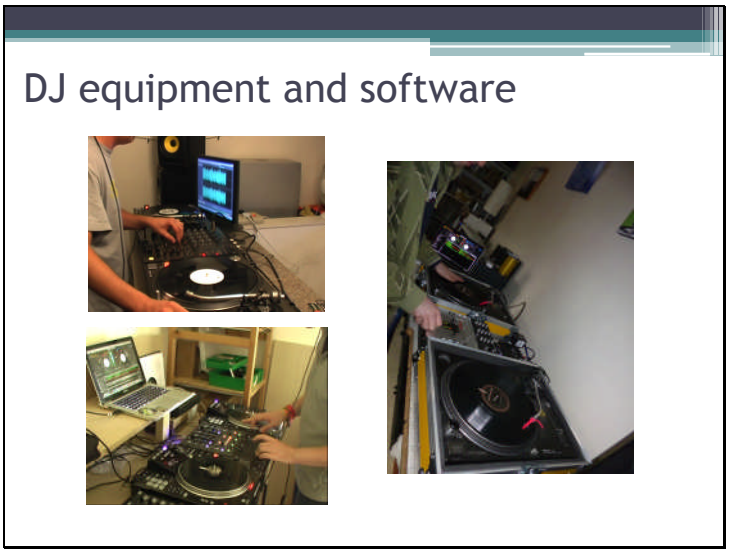

The DJs worked with different technology, ranging from Technics 1210 Turntables and a Pioneer DJM600 mixer to the latest Denon SC3900 Digitial Media Players and a Rane 16 digital mixer.

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Similarities in DJs' perspectives on musical shaping

- Importance of record selection in overall contour of a performance
  - Audience plays a role in this before and during
- Functionality on turntables and mixer
  - E.g. pitch faders, up-faders, equalisation as 'improvisational tools' to manipulate tempo, volume, frequencies
  - E.g. special effects such as echo, reverb, flange

Results showed five main similarities between the DJs.

First, all the DJs emphasised the importance of record selection in shaping the overall contour of a performance, confirming previous literature which has highlighted the centrality of choosing the 'right' tracks in the 'right' order (Broughton & Brewster, 2002; Straw, 1993). As well as reflecting their own musical preferences, the DJs reported that their choices are shaped by other factors such as the type of club (e.g. capacity, sound system, dancefloor/seating), the specific night (e.g. single musical style or combination, night's reputation), the absence/presence of co-performers, and the audience. According to the DJs in our sample, the expected audience exerts a powerful influence on the records chosen both *before* and *during* the performance. *Referring to popular music producers in the recording studio, Hennion (1989) argued that the audience is never 'left outside', that the audience in always in consideration. Similarly for these DJs, their musical choices are made with the audience firmly in mind.*

A second similarity in perspectives on musical shaping was that all the DJs used the functionality on the turntables (e.g. pitch faders) and mixer (e.g. up-fader, cross-fader, equalisation) to manipulate the tempo, volume, and frequencies (e.g. bass, mid, treble) to shape the overall sound. The DJs reported used the existing shape of the records to reduce elements of the out-going tune and increase elements of the in-coming tune, with a particular focus on bassline entries (a combination of which can be 'too much' if equalisation is not sufficiently balanced). They also discussed their use of special effects such as echo, flange and reverb to emphasise key structural points (particularly the 'drop', where the bassline re-enters after a breakdown). These findings confirm previous research (Brewster & Broughton, 1999, 2012; Moorefield, 2005) in that DJs go *beyond* the pre-recorded musical materials they are working with, creating unique compositions, in real-time, in the context of the performance (see also Smith, 2013).

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Similarities in DJs' perspectives on musical shaping

- Inherent 'shape' of musical materials
  - Determines what style of mixing DJ will use

Thirdly, all of the DJs emphasised that records had inherent shape (one DJ contrasted 45 King's *The 900 Number* with DJ Shadow's *Stem/Long Stem* to illustrate this), and much like the classical musicians in Prior's (2012b) study, they argued that it was not possible to eliminate shape entirely from a performance because of this. The DJs in our sample discussed the ways in which they used the existing shape of records, such as placement of 'drops', and equalisation to balance overall sound intensity and musical texture. In trying to perform *without* shape, the DJs were less likely to use the existing shape of the record, or to employ functions on the turntables and mixer, other than for beat synchrony.

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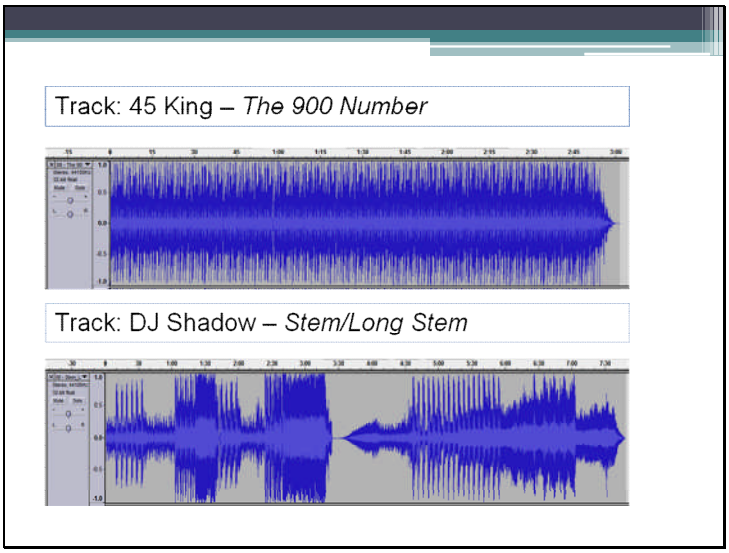

45 King – The 900 Number
http://www.youtube.com/watch?v=__0Lv8W3svE

The DJ explained that because the 900 Number is 2 bars on continuous loop and “there’s no shape at all”, You “have to mix it quickly”, and “build it into a shape” (e.g. add a capella, juggling two copies, layering, equalisation such as cutting the bass)

DJ Shadow – Stem/Long Stem
http://www.youtube.com/watch?v=4NJzqX5sp_c

Conversely, with Stem/Long Stem, the DJ described as “extreme shaping” of a track (sections range from ambient to 200bpm Gabba) and explained that he would not mix another track or a cappella over the top because the tune has “enough shape of its own”

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Similarities in DJs' perspectives on musical shaping

- Performing without musical shaping felt 'unnatural'
  - *"I tried to unlearn everything I know about mixing.. I brought a tune in out of phase, I did not use the EQs'"*
  - *"So you're asking me to play badly?!"*
- Multimodal understanding of shape
  - Expression of shape in the form of visual diagrams, graphs or gestures

Importantly, performing without shaping the music felt 'unnatural' to these DJs, highlighting the seemingly implicit nature of musical shaping. This mirrors a key finding in Smith's (2013) recent work exploring the compositional processes of hip-hop turntable teams; she found that decisions about what samples to use and what techniques to employ were applied unconsciously by the teams in order to achieve the desired musical outcome. There seems to be a tacit understanding that a good performance requires 'shaping'.

A further similarity in Greasley and Prior's (2013) study was the multi-modal understanding of shape the DJs expressed; they used gesture and visual diagrams to explain their notions of musical shaping. In particular, DJs reported using the visual diagram of waveform (i.e. through Serato, Traktor or the sound recording software) to help them to mix and thus control the performance overall.

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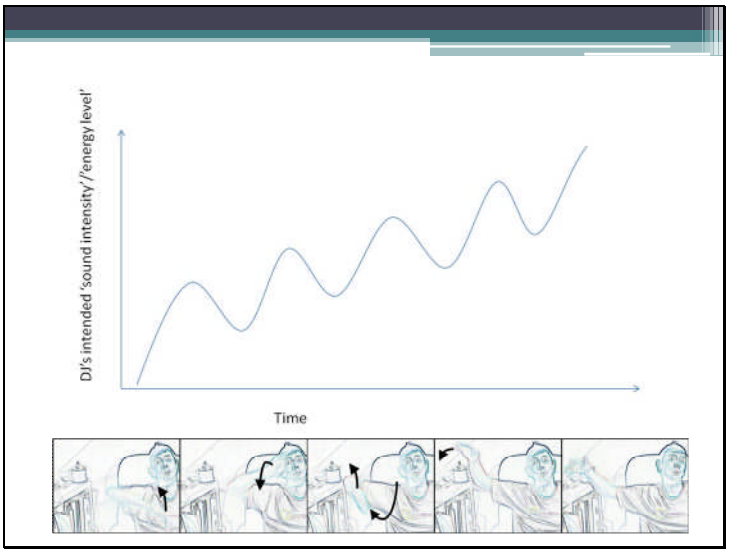

Example of graphical visualisation and gesture:
One DJ reported that his aim was to mix records in quick succession using a smooth (rather than 'choppy') mixing style, building the overall sound intensity/energy (he used these terms interchangeably) gradually over the course of an hour whilst allowing for dips in energy at certain points to enable him to build the energy level back up again. We have depicted the shape of the mix he described in a graph which plots sound intensity/energy against time, and also included stills of him gesturing the shape of this preferred mixing style.

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Differences in DJs' perspectives on musical shaping

- Differences in technological equipment
  - DJs emphasised role of digital systems in:
    - Assignment of cue points in tracks
    - Use of same record simultaneously
    - Looping of segments of tracks
  - "technology for them [DJs] is an integral part of life that offers virtually unlimited creative opportunities" (Poschardt, 1998, p. 365)
- Scratching/turntablism

The DJs worked with different technology and this highlighted key differences in musical shaping. The two DJs working with digital systems discussed their ability to assign cue points and jump straight to those at any point during a performance. They discussed the ways in which they were able to programme sections of the record or samples, use samples from the same record simultaneously (as if playing with two identical vinyl copies at the same time) and loop segments of the musical material. They reported that during a performance, some of this may have been prepared in advance, whilst other choices will be made in response to audience behaviour. The combination of software and hardware allows a greater range of creative acts; as Poschardt (1998) has argued: "technology for them [DJs] is an integral part of life that offers virtually unlimited creative opportunities" (p. 365).

[In addition, programmes such as Serato and Traktor have a synchronisation button, which automatically synchronises the beat on both records being played. If the DJ chooses to use this feature, s/he is spared the expenditure of time required to beat match, and can start applying various effects to shape the sound almost immediately. The role of technology in DJ practices has been explored in detail by Montano (2010) whose research with DJs in the Sydney dance music scene provides further evidence for the practices employed by our participants. He notes that (2010, p. 404):

"The development of technology has enhanced the work of the DJ, so that tracks can be altered and reshaped in order to fit the specific requirements of the DJ. Vocals can be added and tracks can be extended or shortened, allowing the DJ to have more control over the actual 'sound' of their set, which increases the extent to which they can impose their own personal, unique 'musical' identity upon it."]

Both of the DJs working with digital set ups in our study were also scratch DJs, or as Katz (2012) would call them, 'performative DJs' who not only select recordings but manipulate them in real time for audiences. Scratching is a specific performance style which involves the use of turntables as a musical instrument to create and manipulate beats, sounds and samples (typically from a wide of popular music styles) for expressive performance (Katz, 2012; Hansen, 2010; Poschardt, 1998; Smith, 2013). For these DJs (but not the other DJ in the interview study or the questionnaire respondent), scratching techniques were fundamental to shaping their performance. They emphasised the importance of identifying samples and employing various scratch styles (e.g. crab, scribble, hydroplane) and turntablism techniques (e.g. beat juggling) to shape their performances.

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Similarities and differences between DJs (Greasley & Prior, 2013)

Similarities

- Importance of record selection
- Existing shape in musical materials
- Use of controls on decks mixer
  - Equalisation, faders, effects
  - Going *beyond* pre-recorded materials to create a unique performance
- Visualisation of tracks as graphs
  - Expressed through gesture
- Implicit nature of musical shaping

Differences

- Genre preferences
  - Smooth vs. choppy mixing styles
- Turntablism/scratching
- Digital software
  - Visual representation of tracks in real-time
  - Colour distribution of the software
  - Identifying cue points (e.g. looping, samples)

To summarise, there were five main similarities in the DJs' perspectives on musical shaping in our interview study, as listed in the Table. The main differences related to the specific style they were performing in, whether they were a scratch DJ or not, and the technological devices employed during performance. Again, the key role of technological advancements in shaping popular music are brought to the fore.

Summary of DJs' perspectives

- Shape is an integral part of DJ performance
  - Use concept when planning and executing sets
  - Playing *without* shape = playing badly
- Shape related to
  - Musical structure, phrasing, dynamics, samples
  - Tracks, mixes, mixing styles, turntablism
- Multimodal understanding of shape
  - Visual representation of tracks and mixes
  - Indicating shape-related ideas using gestures

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Comparison between classical musicians' and DJs' perspectives on musical shaping

Similarities

- Shape is an integral part of performances
- Shape is multi-faceted
- Expression of shape multi-modally
- Specific technical approaches and techniques
- Employment of heuristics
  - Particularly shape as direction or movement

Differences

- Selection of musical materials *during* performance in response to audiences
- Role of technology

Overall, many similarities with classical musicians – the main difference being the use of various technologies.

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Overall summary

- Exploration of notions of musical shaping in popular music
  - Performer, producer/engineer
  - Live contexts and studio recording
- Popular musicians use the notion of shape to overcome difficulties, in reference to musical structure (or trajectory), and to achieve expressive goals (Prior, 2012a)
  - Some similarities with classical musicians
- Technological developments are at the heart of the creative process in popular music (Théberge, 2001)
- Live contexts - transient, ephemeral listening experience
- In the studio – a fixed, repeatable listening object
- Use of recordings in live context– transient listening

This paper has explored notions of musical shaping from the perspective of performer, producer and engineer, and through the contexts of live performance and studio recordings. The practices of popular music are viewed in a somewhat simplified, layered approach *(and we acknowledge that there are other influences that we haven't covered here such as the audience, and music videos).*

We began with the shaping of the performer in live performance. Recent research has shown that popular musicians use the notion of shape (and images) to overcome difficulties, in reference to musical structure (or trajectory), and to achieve particular expressive goals (Prior, 2010, 2012a). Other research highlights how performers use technology (e.g. microphone, distortion) to achieve particular musical outcomes (Greig, 2009; Théberge, 2001). Futhermore, Greasley and Prior (2013) have highlighted the ways in which DJs use popular music recordings (which may be viewed as a fixed 'final product' once released) to create new musical experiences.

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	Who may shape the music	Means by which the music may be shaped	Final result
LIVE PERFORMANCE	Performer(s)	- Shape of set (choice of repertoire) - Musical structure (through composition or improvisation) - Instrumentation - Instrumental/vocal technique to shape phrases - Microphone technique - Amplification techniques (e.g. distortion, feedback)	Transient, ephemeral listening experience
	Sound engineer (in dialogue with performer)	- Positioning of microphones - Mixing of sounds – EQ, balance - Use of reverb, fading in and out	

Performers and sound engineers in live contexts work towards the production of a transient, ephemeral listening experience in which audience members participate to a greater or lesser extent through singing along and moving to the music.

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STUDIO RECORDING	Performer(s)	As above	Fixed, repeatable listening object
	Producer/Sound engineer (in dialogue with performer)	As above, plus: - Multitrack recording - Selecting musical materials from multiple takes (editing and splicing musical materials) - Special effects (e.g. reverb, delay, chorus, flange) -MIDI sequencing - Digital sampling	
		- Shaping the audio space using microphone positioning - Overall sound (acknowledging technological possibilities, e.g. stereo vs. surround sound)	
		-Covers -Remixing -Mash-ups	

We then discussed the potential contributions of performer, sound engineer and producer in a studio context to create a recording, which is usually viewed as a fixed, repeatable listening object. The role of technology such as placement of microphones, multitrack recording, MIDI sequencing and digital sampling is crucial in this, but we acknowledge that other influences on the finished product, such as other personnel involved in the recording industry and economic factors are also important.

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USING STUDIO RECORDINGS	All of the above, plus:	All of the above, plus:	
	Performer (DJ)	- Overall contour of the performance – choice of records (and specific order) - Use of turntables and mixer to manipulate tempo, volume and frequencies to shape the overall sound - Use of special effects to emphasise musical structure on record - Scratching techniques - Highlighting or manipulating existing shape of records -Looping	Transient, ephemeral listening experience
	Video engineer	- Shaping the visual accompaniments to the sound	

Finally, we discussed the use of recordings in new contexts focusing on the live performances of DJs. DJ performance requires the re-shaping of records that have been previously shaped by others. In this way, just as recordings are seen to enable musicians to go beyond the potential afforded by live performances, DJs go beyond the possibilities afforded by the simple playback of existing recordings by reshaping them into a new performance, or even a new piece of music, usually creating a transient listening experience for an audience.

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Layers of shaping in popular music

	Who may shape the music	Means by which the music may be shaped	Final result
LIVE PERFORMANCE	Performer(s)	- Shape of set (choice of repertoire) - Musical structure (through composition or improvisation) - Instrumentation - Instrumental/vocal technique to shape phrases - Microphone technique - Amplification techniques (e.g. distortion, feedback)	Transient, ephemeral listening experience
	Sound engineer (in dialogue with performer)	- Positioning of microphones - Mixing of sounds – EQ, balance - Use of reverb, fading in and out	
STUDIO RECORDING	Performer(s)	As above	Fixed, repeatable listening object
	Producer/Sound engineer (in dialogue with performer)	As above, plus: - Multitrack recording - Selecting musical materials from multiple takes (editing and splicing musical materials) - Special effects (e.g. reverb, delay, chorus, flange -MIDI sequencing - Digital sampling	
		- Shaping the audio space using microphone positioning - Overall sound (acknowledging technological possibilities, e.g. stereo vs. surround sound)	
		-Covers -Remixing -Mash-ups	
USING STUDIO RECORDINGS	All of the above, plus:	All of the above, plus:	
	Performer (DJ)	- Overall contour of the performance – choice of records (and specific order) - Use of turntables and mixer to manipulate tempo, volume and frequencies to shape the overall sound - Use of special effects to emphasise musical structure on record - Scratching techniques - Highlighting or manipulating existing shape of records - Looping	Transient, ephemeral listening experience
	Video engineer	- Shaping the visual accompaniments to the sound	

These ideas are summarised in a Table which can be found in Greasley & Prior's chapter "Shaping Popular Music" in the forthcoming book *Music and Shape* edited by Leech-Wilkinson & Prior (OUP).

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‘Fallen’: reshaping over time

- Sarah McLachlan’s track ‘Fallen’ from *Afterglow*
- Live performances
- Recorded in the studio with producer Pierre Marchand
- Artist released multitrack stems so fans could remix her tunes
- Remixed by various producers (e.g. Anti-Gravity mix by Josh Gabriel and Dave Dresden)
- Used live DJ performances

An example of layered musical shaping over time

Original
http://www.youtube.com/watch?v=Jqps9ZdMxs0

Remix
http://www.youtube.com/watch?v=eUeBKQA2UMk

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Future directions in understanding popular musicians' notions of shape

- Need to study a broader range of
  - Musicians
  - Genres
  - Instruments
- Role of co-performers
  - Classical duet, Jazz duo, DJ 'back-to-back'
- Need to study producers' and engineers' perspectives

In order to draw firmer conclusions about whether the notion of shape is relevant to, and used by popular musicians, more in-depth work would need to be carried out using a broader range of genres, and a broader range of musical populations, particularly engineers/producers.

A more complete write-up of these ideas, and a summary of implications and potential future directions will be available in our forthcoming chapter:

Greasley, A. E. & Prior, H. M. (forthcoming, 2015). Shaping popular music. In D. Leech-Wilkinson & H. M. Prior (Eds.) *Music and Shape*. (pp. tbc). Oxford: Oxford University Press.

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