

Improvising Using Beat Making Technologies in Music Therapy with Young People

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ABSTRACT This article offers insights into using various music technologies associated with beat making culture in music therapy improvisation groups. Discussion regarding the use of music technology in music therapy practice dates back several decades, yet practical resources to help therapists implement this technology in everyday practice remains relatively limited. With the increasing centralisation of beat making in youth cultures and mainstream popular music, the use of beat making equipment is also becoming a more common part of music therapy practice. This article presents three music therapy improvisation procedures that use music technology and locate this technology within the traditions and aesthetics of beat making culture. To do so, the paper draws on our experiences setting up a beat making laboratory to trial different electronic methods in therapeutic groups and to teach music therapy graduate students basic beat making techniques for practice settings. We discuss the benefits and challenges of each procedure and present several practical recommendations. The procedures and recommendations offered do not aim to represent a comprehensive or exhaustive model of what is possible. Rather, they are intended as starting points to help practitioners imagine the multitude of possibilities that beat making and music technology can offer music therapy and the clients the discipline exists to serve.

Keywords: *beat making, music technology, improvisation, Hip Hop culture, adolescents*

Introduction

Music Therapy and Music Technology

Authors and practitioners have been discussing the implications of integrating music technology into music therapy practice since the late 1980s (Krout & Mason, 1988; Nagler & Lee, 1987) and early 1990s (Krout, 1990). Yet, as identified by Crowe and Rio (2004), appropriate recognition of the growing role of music technology in music therapy training and research has been slow to follow. Nevertheless, we have seen an increasing number of journal articles published in the last decade (for reviews, see Knight & Krout, 2016; Knight & Lagasse, 2012) and number of dedicated books (Krout, 2015;

Magee, 2014b). This growth in publications suggests that we are experiencing increased scholarly engagement in this area. A more recent survey of practice by Hahna, Hadley, Miller, and Bonaventura (2012) also reports that some institutions have begun to integrate music technology competencies into training courses. Nevertheless, others acknowledge that, given the proliferation of such technologies, opportunities for practitioners to gain skills in applying music technology to therapeutic processes through formalised channels remain markedly lacking (Kubicek, Martino, & Zigo, 2011; Ramsey, 2014). These acknowledgements suggest an ongoing need for research and scholarly literature that more fully reports on both the technologies used and how they were implemented in practice (Magee, 2014b; Ramsey, 2014).

Some such resources do exist. Notably, *Music Technology in Therapeutic and Health Settings* contains a collection of scholarly book chapters edited by Magee (2014b). These chapters also aim to address this gap in resources, by offering numerous examples of where and how a range of technologies have been successful with various client populations. Topics include a definition of devices and resources commonly used in therapeutic settings (Krout, 2014b), the value of music technology when working with children with visual impairments (Martino, 2014), young people with autism (Krout, 2014a), and clients with multiple and complex needs in schools (Zigo, 2014). Several examples of work with adults are also presented, from adults in cancer care (Kubicek, 2014) to elderly people with chronic health issues (Weissberger, 2014). Importantly, authors also highlight potential challenges when using technology in therapeutic settings. Such challenges include the ethical implications of sharing recorded musical contributions outside the therapeutic space (Magee, 2014a), and how gender norms around technology may influence therapists' training and use of equipment (Magee & Wimberly, 2014).

More recently, Knight and Krout (2016) have sought to demystify the ever-growing range of equipment in this landscape by providing a typology of available technologies. In describing Adaptive Use Musical Instrument (AUMI) software, Dvorak and Boresow (2018) undertake a similar task in the software realm and describe potential symbiosis between therapists and software developers.

Music Technology as Authentic Musical Engagement

To date, however, music therapy literature has tended to focus on music technology as an assistive device when a client's ability to engage with acoustic instruments is compromised (Crooke, 2018). This focus includes, for example, working with people with disabilities (Martino, 2014) or older adults (Engelbrecht

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& Shoemark, 2015; Weissberger, 2014), where access to non-technology-based instruments is limited (Knight & Krout, 2016; Kubicek et al., 2011). Such work is invaluable, as music technology offers a vast range of devices and techniques that can aide or augment accessibility to musical participation.

Yet, less attention has been paid to the use of music technology in the context of contemporary musical cultures (such as Hip Hop and the many forms of electronic music) and practices (including composition and live performance), many of which use this technology as the primary means of authentic aesthetic, cultural, and creative engagement (Crooke, 2018; Viega, *In press*). There is, however, a growing body of music therapy literature which has located music technology within the context of contemporary culture. This literature describes technology as central to facilitating meaningful creative expression and therapeutic outcomes for certain client groups (Nagler, 2014). Sadovnik (2014) describes how a digital recording studio was able to appeal to the musical preferences and identities of adults in a hospital setting who identify as being part of the Hip Hop generation. Lightstone (2012) also explains how, in the context of Hip Hop culture, drum machines can not only appeal aesthetically to young clients, but also provide familiar musical frameworks that facilitate liberating improvisation experiences. Viega (2018) argues the need to acknowledge the humanistic qualities of music technology, and the role it can play in facilitating voice and agency for 21st century adolescents for whom digital technologies play a central role in identity formation.

Such work has helped further expand discourse around technology, and more fully articulate its role in facilitating

authentic and meaningful engagement in the therapeutic encounter. To support this expansion in practice, this article aims to undertake three key tasks: (a) describe the set-up of a studio designed to support technology-centred music therapy, (b) present three different technology-based improvisation procedures for use in music therapy, and (c) describe key challenges and considerations when using music technology in therapy settings. To fulfil these aims, this article reports on the set-up of a studio designed for teaching and music therapy purposes. The first two procedures drew on research exploring experiences of grief with two adolescent males who visited the studio as part of a partnership with a local school that serves students disengaged or excluded by other schools or education providers. One of the young men was 17 years old and identified as white, and the other was 13 years old and identified as an Indigenous Australian. Experiences of teaching music therapy students also informed the first two procedures and were central to the development of the third procedure. These students were in the second year of their master's degrees, and reflected the diverse cultural groups living in Australia, as well as the high representation of students from Asian countries such as China, Malaysia, and Singapore at the university.

The detail-orientated focus of describing these procedures aims to help fill a gap in this area by providing a resource for teaching, and for music therapists wanting to integrate music technology into their own practice for the first time. Details regarding the equipment used in the studio, and the procedures, can be found in Table 1 and in Figures 1–3.

Table 1
List of Studio Equipment and Functions

Equipment	Description and Functions
Electronic Music Production Instrument (EMPI)	
Roland TR-8 drum machine	Standalone drum machine step sequencer, modelled on the TR-808 and TR-909
Audio-Technica Turntable, paired w Rane 2-Channel Scratch Mixer	Vinyl turntable paired with a DJ mixer, both designed for DJing and Turntablism
Roland Boutique JX-03	Standalone synthesiser with inbuilt step sequencer (optional keyboard attached)
Roland Boutique VP-03	Standalone synthesiser with inbuilt step sequencer (optional keyboard attached) and Vocoder microphone
Korg Monologue	Standalone synthesiser with inbuilt keyboard and step sequencer
Korg Kaossilator Pro+	All-in-one drum machine and synthesiser, played via inbuilt XY touchpad
Ableton Live Suite Software	All-inclusive Digital Audio Workstation (DAW) installed on computer
Ableton Push 2 Controller	Comprehensive USB-MIDI controller. Designed to pair with Ableton Live, with grid of 64 rubber pads to play samples, trigger clips and much more
Akai MPC Essentials Software	Production DAW designed for Akai controllers
Akai MPD 226 Controller	USB-MIDI controller with grid of 16 rubber pads to play samples, modelled as controller version of original MPC sampler interface
Akai APC Keys 25 Controller	USB-MIDI controller with grid layout of 40 rubber pads to launch clips and keyboard
Other studio equipment	
Focusrite Scarlett Audio Interface	Digital USB interface used to connect external sound sources to computer/DAW, and route sound from computer/DAW to mixer or speakers
Yamaha 12XU Desk Mixer	12-Channel desk mixer used to manage sound output from all EMPIs, and route to speakers
KRK Rokit 8" Studio Monitor (x2)	Speakers used to output sound from all EMPIs (via desk mixer)

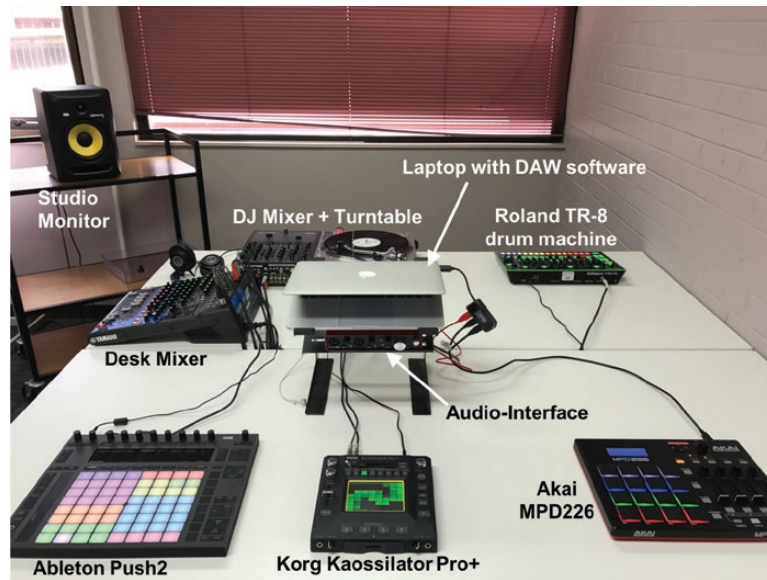
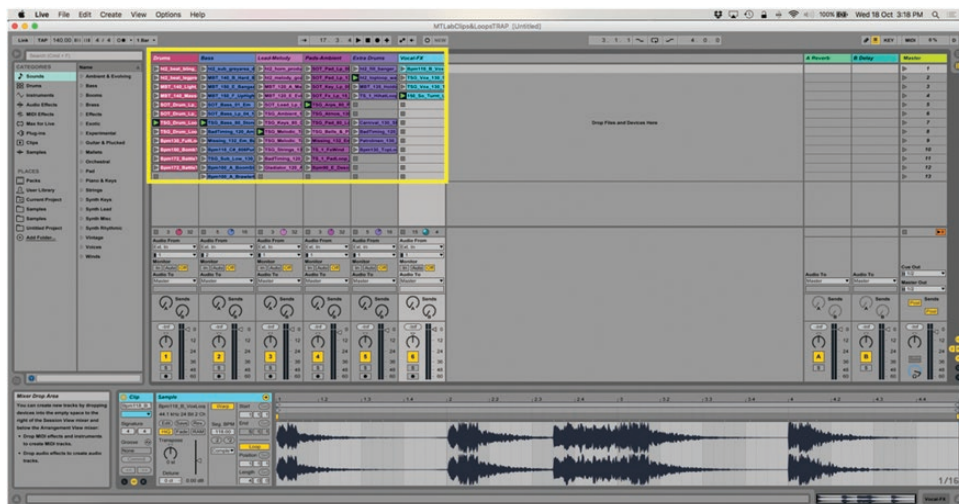


Figure 1. Desk set up for Approach ‘n’ Play procedure with EMPIs labelled.



Ableton Live “Session” Window (above) & Close up of arranged clips (below)

Drums	Bass	Lead-Melody	Pads-Ambient	Extra Drums	Vocal-FX
ht2_beat_bling	ht2_sub_greyarea_d	ht2_horn_produ	SOT_Pad_Lp_09	ht2_fill_banger	Bpm118_B_Vox
ht2_beat_legpre	MBT_140_B_Hard_8	ht2_melody_god	SOT_Pad_Lp_13	ht2_toploop_wa	TSG_Vox_130_S
MBT_140_Light	MBT_150_E_Bangad	MBT_120_A_Ma	SOT_Key_Lp_05	MBT_135_Holdit	TSG_Vox_130_T
MBT_140_Mass	MBT_150_F_UpHigh	MBT_120_E_Ev	SOT_Fx_Lp_15	TS_1_HihatLoop	150_So_Turnt_U
SOT_Drum_Lp	SOT_Bass_01_Em	SOT_Lead_Lp_4	TSG_Arps_80_F		
SOT_Drum_Lp	SOT_Bass_Lp_04_1	TSG_Ambient_1	TSG_Atmos_13		
TSG_Drum_Loo	TSG Bass_80_Ston	TSG Keys_80_C	TSG_Pad_80_Lc	Carnival_130_Sl	
TSG_Drum_Loo	BadTiming_120_Am	TSG_Melodic_T	TSG_Bells_&P	BadTiming_120	
Bpm130_FullLo	Missing_132_Em_B	TSG_Melodic_T	Missing_132_Er	Patrolmen_130	
Bpm150_Bomb	Bpm118_C#_808Pur	TSG_Strings_13	TS_1_FxWind	Bpm130_TopLo	
Bpm172_Battle	TSG_Sub_Low_130	BadTiming_120	TS_1_PadLoop		
Bpm172_Battle	Bpm100_A_BoomSl	Gladiator_120_A	Bpm90_E_Deso		
	Bpm100_A_Brawler				

Figure 2. Arrangement of audio clips in Ableton Live® (version 9) software.

Music Technology and the Hip Hop Tradition of Beat Making

Drawing on the first author’s recent paper (Crooke, 2018), music technology is positioned here within the Hip Hop tradition of beat making. Hip Hop culture emerged among

African-American and Afro-Latino communities in the South Bronx during the 1970s and 1980s, in the context of significant social, political, and economic marginalisation (Rose, 2008). A key element of this culture was the use of technology



Figure 3. Desk set up for Clip-Jamming procedure showing Akai APC Keys 25 and trigger pads.

(record players/turntables) to play selected parts of records to form new arrangements (Chang, 2007). With the advent of relatively affordable drum machines and sound-sampling technology, this practice evolved into the tradition of 'beat making'. Schloss describes this tradition as 'us[ing] digital technologies to take sounds from old records and organize them into new patterns' (2014, p. 1). This definition is extended here to include the incorporation of sounds from any source, including those made via digital technologies themselves, such as synthesizers and electronic drum machines. While, arguably, Hip Hop culture has the longest tradition of beat making, many subsequent musical styles and genres have centered the use of digital technologies, including House, Techno, Trance, Drum and Bass, and Dubstep.¹ Those using digital technologies to compose original compositions in this tradition are known as 'beat makers', or sometimes 'producers'. Beat makers may have no formal musical training² in conventions (i.e., Western notation, scales, and chord structure) or through channels (i.e., paid lessons and conservatories) accepted in the Western canon, and often focus on self-taught or peer-to-peer learning instead (Said, 2016). Beat makers do, however, spend years practicing, honing, and elevating their artforms, and are held accountable by peers on the stylistic elements of their chosen style (Schloss, 2014), including

sample use, depth and fidelity of bass frequencies, rhythmic feel, and individual sound choice or design.

This paper refers to the individual pieces of beat making equipment employed in these practices using Said's term EMPI: 'an acronym (pronounced: em-pee) that stands for Electronic Music Production Instrument' (2016, p. xx). To promote readers' familiarity with, and ability to implement the improvisation procedures described here, we explain the studio set-up and equipment used before outlining the three procedures and our key learnings. For more information on the historical and cultural significance of the EMPIs described, along with typologies and description of key functions, see Crooke (2018).

The Beat Making Studio

During 2017, we established a beat making studio for research and teaching purposes at our university. This creation was a joint venture between the first author, who has over 15 years of experience as a beat maker, and the second author, who has over 20 years of experience as a youth-focused music therapy practitioner and academic. The studio set-up consists of two benches (900 mm height × 2,000 mm width × 800 mm depth) that can be wheeled into the middle of the room, and arranged back to back, forming a square-like island. EMPIs can then be placed so that participants can play standing up while facing each other around the table and benches can be arranged side by side along the back wall when not in use. For reference, a list of the EMPIs and other equipment in the studio is provided in Table 1, and a photo of the desks and selected EMPIs is provided in Figure 1.

Methods

The opportunity to establish the aforementioned studio emerged during and as a part of our existing roles. We were privileged to be two white Australians employed by the nation's leading university and working together on a research project funded by the Australian Research Council, which gave us access to significant resources. We leveraged this opportunity to explore a number of possibilities, including the exploration of technologies and a collaborative group facilitation approach drawing on the skills of a music therapist and a beat maker.

To explore potential technology-based improvisation procedures for use in music therapy and identify related benefits, challenges, and considerations, we incorporated these beat making resources into two key areas of our work during 2017. First, we integrated the gear into our teaching with approximately 20 music therapy students in the final year of their master's degree. Specifically, the EMPIs were integrated into units focusing on group work and improvisation. Simultaneously, we facilitated a music therapy bereavement support group in the beat making studio for adolescents from a local, alternative school. This group ran for 6 months and centred the EMPIs as instruments for group and individual work. While membership varied, this group comprised primarily of two young men: a 17 year old who identified as white and a 13 year old who identified as an Indigenous Australian.

As facilitators, we discussed regularly during this time about the ways that integrating beat making technologies influenced our teaching and therapy, with the intention to improve our

¹Providing a full typology or taxonomy of music genres and styles that use beat making practices is outside the scope of this article, yet many resources are freely available to readers wanting to familiarise themselves with their history and key musical elements. For example, see <https://musicmap.info>, <https://pigeonsandplanes.com/in-depth/2012/04/introduction-to-electronic-dance-music-breaking-down-the-genres>, and Kirss' (2007) *Audio based genre classification of electronic music*.

²Although, many beat makers do have formal musical training.

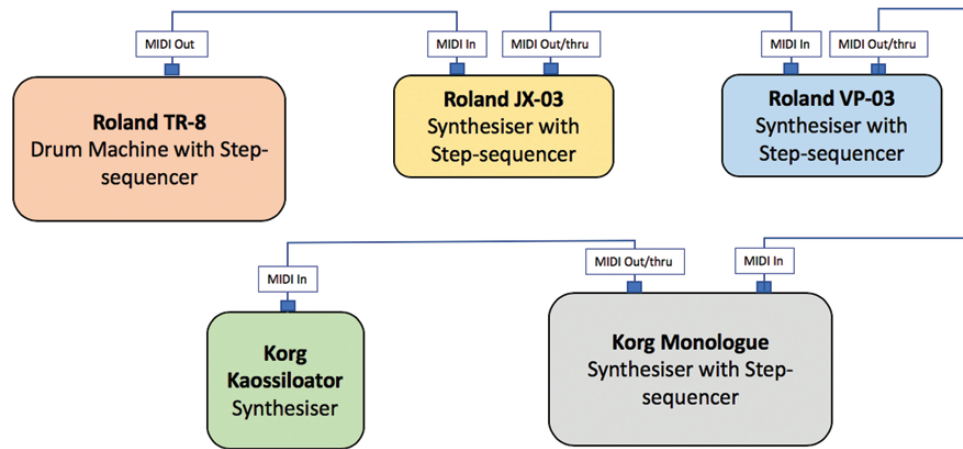


Figure 4. Diagram of MIDI-Linked Jamming set-up showing MIDI connection types and order.

practices. This discussion was based on recognition that this integration is necessary given the growing importance of beat making in youth music cultures. This perspective was consolidated in findings from a study of 3,393 Canadian students between the ages of 13 and 18 years, which showed Hip Hop and Rap music was the most popular music genre across a diverse range of adolescents (Tanner et al., 2008). Although those findings were based on data collected in 2002, they are supported by recent figures indicating that Hip Hop is now the most popular music genre in the United States (Nielsen, 2018) and the world (Hillyard, 2015). They also accurately reflect the interests of adolescents we regularly meet in Australia and are consistent with recent discourse in North American music therapy literature regarding youth and digital music cultures (Viega, In press). We were therefore not interested in testing the effectiveness or questioning the relevance of beat making technologies, but rather, exploring how we might better integrate them into our practices with young people.

We adopted quite specific roles within the therapy and teaching groups we ran, with Author 1 being responsible for setting up, explaining, managing, and documenting the technologies; and Author 2 planning structures, leading sessions, working with relevant group dynamics, as well as documenting the therapeutic process. Our mutual respect for one another's distinct skillsets was apparent from our behaviour and the explanations we offered to participants. This delineation established clear boundaries between our roles, both for ourselves and for the people in the groups that we worked with.

Data were collected primarily through participant observation and detailed session notes, which we regularly discussed and reflected on. These data were supported by several formal and informal interviews with participants. This research was approved by the Ethics Review Board of our university (Project 1749547.1, The University of Melbourne).

Three Improvisation Procedures

Bruscia (2014) has identified improvisation as one of the four main methods of music therapy, and within that, defines procedures that therapists may undertake to facilitate different musical experiences within an improvisation framework. In this research, we explored three different improvisation procedures: two of which were directly related to existing practices in

music therapy and one indigenous to beat making culture and the unique affordances of electronic technologies. We focus on improvisation specifically in this article—although song writing was also important in the sessions—because we believe that beat making technologies have already been successfully integrated into song writing methods in music therapy (Baker, 2016; Roberts, 2006; Viega, 2014, In press), and that the use of applications such as GarageBand are relatively mainstream and well understood (Knight & Lagasse, 2012; Weissberger, 2014). A combination of the first author's pleasure in shared electronic improvisations and the second author's faith in the value of improvisation for working with groups of adolescents further shaped our decision to more deeply explore improvisational methods. To this end, we articulate three procedures that were founded in our background experiences and explored how they might be developed with technologies for music therapy practice. In the following sections, we briefly describe these three procedures and then afterwards reflect on what we learnt from both the context of a bereavement support group for teenagers and the teaching of music therapy students. We considered at length the level of technical detail to include when describing these procedures, and while we opted for less detail, some technical information has been included. This decision was based on our recognition that such detail is currently not available in the literature for music therapists wanting to reproduce such procedures, and that this information can be invaluable given the technicality of using EMPs.

Approach'n'Play

Approach'n'Play is a procedure designed to facilitate instant music making with electronic devices; devices are pre-prepared by facilitators, so clients can approach and start playing sounds without needing to use dials or knobs to select sounds or adjust settings. We developed this procedure to enact psychodynamic principles of intrapersonal and interpersonal exploration, with a particular focus on emotional processing and group dynamics (Kim, 2016). Author 2 has regularly used group improvisation in group adolescent bereavement support work, often introducing themes to suggest directions in emotional processing, such as playing different feelings (McFerran, 2013). Following this group improvisation model, the *Approach'n'Play* procedure involved asking the young men to identify a relevant feeling such as

happy/angry/sad and then make music in a way that depicts that feeling. The musical experience was often processed verbally following the playing, with the therapist offering language and interpretations to support the young men better recognise the difference between feelings and to articulate nuances around how feelings might be portrayed. For example, young men often played loudly in response to the word 'anger', which the therapist would validate, but also ask questions about whether anger is sometimes experienced in silence in order to expand the young men's abilities to recognise anger in myriad forms and increase their repertoire for expressing it. Traditionally, hand percussion and amplified band instruments might be used for this purpose and in this project we explored how that would directly translate to the beat making technologies. We introduced the *Approach'n'Play* procedure after first playing different feelings on hand percussion instruments, including djembes and doumbeks,³ and then moving to the technology bench and exploring how we would play on the EMPIs. This transition allowed us, as facilitators, to feel confident in introducing the new technologies; however, there is no reason this would be necessary once we were more experienced in using the technologies for this purpose.

We offered minimal explanation to the young men in our group about how to play the gear, and Author 1 spent less than 5 minutes explaining the equipment that had been carefully positioned on the standing benches in the beat making studio (see Figure 1). Group members appeared excited about improvising on the EMPIs and immediately pushed buttons and asked questions about the intricacies of the gear. After the introductory exploration, we then quietened before commencing the therapy activity. The clients appeared to find the transition simple and processed emotional meanings in the post-improvisation conversation. Discussion included descriptions of how some sounds represented their excitement, whilst others represented lullaby sounds that connected them to their childhood, and which we interpreted as being attachment references. The therapy facilitator (Author 2) found the process very similar to using traditional instruments.

It is worth noting that significant set-up time was required to make these technologies immediately accessible, non-confronting, and not overwhelming. Author 1 had prepared three controllers (see Figure 1), one for each of our clients, and with each one offering a minimum of 16 different sounds. The first was the Ableton Push 2, a MIDI controller which can be set to '64-pad mode'. We chose a range of sounds from the first author's extensive sample library and used the computer (via the Ableton Live DAW) to group them in different sections of the 64-pad grid according to instrument/tonal quality. We used the Push 2's ability to assign colours to different pads and allocated each group a different colour. For example, bright piano sounds were coloured red and placed in the top right-hand corner, while the bottom left pads were coloured green and played mellow jazz guitar chords. Also included were ethereal synth plucks, moody piano and organ chords and licks, funky horn stabs, dirty/dark synth basses, and acoustic

basses. Because of the 64-pads and enlarged grid layout, two people can play the pads simultaneously, particularly when placed on the corner of a bench. While the Push 2 has a series of extra buttons, dials, and faders, the pads are physically central to the EMPI and the bright colours of the pad groups drew attention away from extra functions.

To enable the MPD226 (another pad-based MIDI controller) to be played simultaneously, Author 1 also loaded up the MPC Essentials DAW (on the same computer) and connected the controller to this software. Different synth, acoustic, and sound-effect samples were assigned to the 16-pads of the MPD226, again taking advantage of the pads' coloured lighting to reduce the distraction of other functions. To increase the range of sounds, we included some vocal samples, such as 'Feel the music', 'We're all in this together', and 'Let's do this'.

The Kaossilator is a standalone synthesiser and drum machine, and therefore did not need to be connected to the computer, and we were able to set this EMPI so the touchpad was playing one of the many inbuilt synth sounds. To allow participants opportunities to play satisfying melodies or drum loops without need for traditional music skills, we often took advantage of the 'set scale' or prearranged drum beat options.

These three EMPIs were placed side-by-side on one desk, with plenty of space in between, to produce an uncluttered feel (see Figure 1). The TR-8 drum machine, turntable, and DJ mixer were placed on the other desk (facing the first) along with the desk mixer. All other EMPIs were removed after the initial session and placed in a cupboard to minimise chances to overwhelm the clients. Only when all of these interfaces had been programmed were we able to offer the procedure, and even then, technical glitches were not uncommon and required adjustments during sessions.

Clip-Jamming

Clip-Jamming makes use of pre-recorded loops (segments of sound or MIDI information), which the client can 'trigger' individually or as groups using buttons to form dynamic, original arrangements in real time. Much like *Approach'n'Play*, the *Clip-Jamming* procedure was designed to support clients to improvise immediately with the beat making technologies. Rather than targeting emotional processing and offering interpretations of potential meanings of the music as in *Approach'n'Play*, we used this procedure to encourage identity exploration within a humanistic framework, similar to Viega (2018). This process drew on the centrality of beat making to Hip Hop and other popular forms of youth music by connecting young people's music preferences to possibilities for exploring sounds in ways that expressed 'Who I am'. Identity exploration has been identified as a common goal of music therapy work with adolescents in a review of the literature (McFerran, 2010), and young people's changing musical identities have been theorised as central to the process of music therapy with young people experiencing mental illness (Hense, McFerran, & McGorry, 2014). Working with identity development in adolescence has often relied on sharing existing songs (i.e., Cheong-Clinch & McFerran, 2016) or song writing (Derrington, 2005; MacDonald & Viega, 2012), particularly when addressing grief (Dalton & Krout, 2006; Roberts, 2006). To the best of our knowledge, identity work

³'Doumbek' is used here to refer to a style of goblet drum commonly found in some Middle Eastern and North African countries, and we acknowledge that this style of drum may also be referred to or known by names such as 'darbuka'.

has not previously been described using beat making technologies within an improvisation method.

We noticed the nature of the improvisations were quite different from the interactive nature of *Approach'n'Play*. We often chose not to interrupt the client's jamming by suggesting or eliciting interaction. Instead, we offered presence and feedback after the playing, demonstrating our willingness to listen and witness their process. At other times we did interact verbally, yet this interaction focused on offering affirmations or stylistic reflections on the young person's choice of sounds, rather than interpreting them. This reduced interaction often resulted in long solo improvisations that needed to be facilitated independently of other group members. Therefore, this procedure either occurred in sessions when only one participant present or required one of us to engage other participants in alternative activities.

In this project, the young men had very specific beat-based genres they affiliated with. We provided loops and clips that accurately represented these preferred genres, and arranged them in consistent templates to make them accessible. For example, for one young man, the first author selected a range of audio clips (from free online downloads, and their own collection) that were consistent with Trap music⁴ and then arranged these into the Ableton Live 'Session' window, which consists of a grid of cells into which clips can be placed⁵ (see Figure 2). Six columns were added for six different types of loops: drums, bassline, lead-melody, pads-ambient, extra drums (fills and hi-hats), and vocal-FX. Approximately 10 audio clips were placed in each column. These clips could then be triggered using the pad grid on the Akai APC Keys 25 controller (see Figure 3), where each physical pad correlates to a single clip loaded in Ableton Live. When playing back clips, it is only possible to play one clip in each column at a time, meaning that there will only ever be one bassline playing at one time. Triggering a second clip in a column will result in the second clip starting when the first clip has reached the end of its current loop or bar. However, it is possible to combine clips between columns, and (in this case) have up to six clips playing together at once to combine multiple song elements. Therefore, in setting up, we needed to ensure that the different combinations were sufficiently compatible in regards to melodic and harmonic structure when the project was saved in Ableton Live.

Again, the preparation and ongoing management of sounds was complex. The facilitator needed to be both knowledgeable about an array of beat-based genres and capable of creating a range of musical options within each of these. They also needed to ensure sounds were musically cohesive, no matter how they were played with one another. This preparation took considerable time before sessions, and was supplemented by modifications within sessions, as clients commented on different parts of beats that they liked or disliked. This procedure was therefore more feasible for individual work than with groups. It also led readily towards song creation, which we felt

worked particularly well once identity exploration had been fostered through improvisations. In our group, while one of the young men chose to create their own original beat, the other chose improvisation with the *Clip-Jamming* procedure to arrange and record a soundscape that he could improvise lyrics over in sessions and share with friends and family beyond sessions. In both cases, the young people began to experience themselves as competent beat makers within a short time frame due to the accessible and finely tuned set-up, which addressed the purpose of musical identity exploration.

MIDI-Linked Jamming

MIDI-Linked Jamming refers to the use of two or more devices connected via MIDI to play and manipulate pre-arranged sequences at a synchronised tempo. This procedure explored collaborative music-making processes unique to beat making cultures in dance-oriented traditions such as Techno or Electro-House. This uniqueness can be seen in the use of multiple EMPIs playing different but synchronised looped sequences, which are manipulated in real-time to produce spontaneous and often complex improvisations. In many Dance-oriented genres, including Techno, House, and Trance, this technique was (and often still is) the primary way for artists to perform their music live without DJing. The technique is often also used to compose and record songs without DAWs.

In our project, we used this procedure with the music therapists in training, rather than with the clients who had therapeutic needs. Therefore, we did not assume that the procedure would provide participants a way to explore their own identity. Rather, it was designed as a way for students to explore and foster appreciation for the aesthetics and music-making traditions of many contemporary popular musical genres, which can be seen to contrast the musical traditions many students were trained in. We intended for the outcome to be enhanced listening, communicating, and cooperation with each other to generate a cohesive sound.

The Australian cohort of students we worked with found this procedure challenging since the act of music making required was quite different from a Euro-centric model of music creation that centres on a musical score, where notes are played in real time to create a linear narrative (Hein, 2018). In contrast, beat-based genres centre on looped rhythms. The role of the musician in *MIDI-Linked Jamming* is to sculpt sounds in (often) pre-programmed phrases or sequences. Here, effects, sound envelopes or other synthesis controls,⁶ are used to build and release tension by increasing and decreasing the volume of different sounds, or taking different parts of the beat in or out. In this way, many beat-based music genres are described as Afro-centric rather than Euro-centric, given the focus on a cyclical sense of time (Lightstone, 2012) and the layering of poly-rhythms used in traditions such as West African drumming (Hein, 2018; Hill-Cantey, 2013; Lightstone, 2012), where 'the repetition of a well chosen rhythm continually reaffirms the power of that rhythm' (Keyes,

⁴Trap music is a style of Hip Hop music that originated in Atlanta, Georgia, United States. Notable characteristics include repurposing sounds from the original Roland TR-808 drum machine (i.e., emphasising the sub-bass of the kick drum and re-pitching snares). Typically, Trap focuses more on electronic sounds than samples, and has a tempo of approximately 140 bpm with major kick and snare hits placed at half time, and 16th note triplet hi hats.

⁵These clips can either be audio or MIDI clips; however, only audio clips were used in this project.

⁶In this context, 'effects' refer to processing applied to an existing sound source, such as echo, reverb, delay, or tremolo. 'Sound envelopes' refer to adjustments that can be made to the attack, decay, sustain, and release of a note. Typically, these can be controlled via dedicated dials, sliders, or buttons on EMPI interfaces (particularly synthesisers), and serve to alter a sound or its character in real time. When combined with things like frequency modulation, this process can be referred to as sound synthesis and the dedicated controls as 'synthesis controls'.

1996, p. 236). Others argue that while beat-based music is heavily informed by Afro-centric (and other non-Western) traditions, and remains in contrast to Euro-centric forms, it represents a distinct tradition in itself (Said, 2016).

MIDI-Linked Jamming also allows artists to connect their EMPIs together in a series so that they can play together in time. The first EMPI in this series can stop, start, and control the tempo for all connected EMPIs. A visual diagram of the set-up used in sessions is depicted in Figure 4. Before each session, the first author would programme a pattern into each EMPI (sometimes using a given scale, sometimes not), and ensure that all were connected successfully so that when play was pressed on the first EMPI, students could focus on sculpting sounds. The set-up required EMPIs with inbuilt sequencers, and that could receive (and preferably send) MIDI information specifically related to timing.⁷ This functionality requires EMPIs to have an internal clock which can be set at, or synced to, a specific bpm value (as a general guide, if an EMPI does not have a function that allows you to set the bpm, it likely does not have an MIDI clock). Once again, a wealth of understanding of both the technology and associated genres was needed to facilitate access to this procedure.

Considerations and Recommendations

From these experiences, we have identified a number of key considerations and recommendations for integrating beat making technologies into therapeutic programmes with young people. Whilst many of the facilitation techniques related to improvisation are similar to using traditional percussion or electronic band instruments, a number of considerations emerged that were directly related to the beat making technologies, which was our focus in this project.

Facilitation

When using EMPIs in therapy, it seems important that at least one facilitator has the necessary familiarity with the equipment, and associated musical cultures, to maximise benefits. If choosing to integrate these technologies, it may require therapists not already familiar with these genres to dedicate significant time to becoming familiar with their chosen EMPIs, and the key artists and stylistic elements of different beat making music cultures. Many of the available technologies are not immediately intuitive and therefore require practice beyond sessions. Although we utilised the more sophisticated EMPIs available in our studio, Garageband on smartphone and tablet devices could be equally suitable and have a number of pre-loaded templates that sufficiently represent different genres. These may provide a more accessible and less time-consuming alternative for therapists who do not use more nuanced programmes such as Ableton Live in their own practice as artists.

Alternatively, we encourage therapists to engage beat makers as co-facilitators. This approach not only aligns with the growing salience of culture-related music therapy standards (Hiller & Gardstrom, 2018), but may also promote client engagement and offer opportunities to acknowledge, engage, and support the work of practitioners from beat making communities

⁷There are numerous online resources which explain the different types of MIDI information, a good place to start are with the articles and tutorials available on the MIDI Manufacturers Association (MMA) website <https://www.midi.org/articles/tutorials>.

(Crooke, 2018). Co-facilitation seems particularly valuable in group work that utilises technology. Managing the technicalities of multiple EMPIs (particularly with complex set-ups) can be demanding and often requires dealing with technical difficulties in the moment. We suggest that managing these technicalities while maintaining presence and commitment to the therapeutic process represents a significant challenge. This supports previous observations that such technical difficulties can disrupt the therapeutic 'flow' (Magee & Burland, 2008).

We also found it necessary to dedicate time before sessions to prepare equipment. This included both physical set-up (connecting cords, testing sound), and preparing sounds to be used. Oftentimes, this required time searching for and loading certain sounds into software and hardware in ways that made them immediately accessible to participants. We recommend integrating this preparation into usual session planning. Whilst somewhat onerous for facilitators, this front end work seemed to make it easier for the young people to access active music making than traditionally popular styles like Rock, since guitar and drum playing can be more difficult to learn than carefully prepared EMPIs.

Choosing Sounds

As speakers were responsible for emitting all sounds from EMPIs, yet had limited frequency range, considering which sounds were made available became critical. For example, playing two or more bass-heavy sounds simultaneously resulted in unpleasant 'muddy' sounds in the low frequencies that could overwork or damage speakers. Playing too many sounds in any frequency range can also make it hard to differentiate between them aurally, meaning that clients might struggle to distinguish which sound is theirs (see also *Speaker Set-up* below). Therefore, we believe that it is important to choose complementary rather than competing sounds.

To this end, we often considered a typical small-band arrangement: one bassist plays low frequencies; a handful of instruments play chords in the mid-range; and one or more play lead melodies or solos, often in higher frequencies. Drummers play across all frequencies and negotiate lower frequency bass drums with the bassist. A vocalist may occupy mid- or high-frequencies, but instruments often soften or stop during verses to allow vocals to sound through. This is the way bands (often intuitively) negotiate the frequency spectrum. When all instruments share the same speakers, this need increases. We therefore found assigning band roles to EMPIs helpful. For example, we arranged equipment and sounds so that only bass sounds were available on EMPI, while only mid-range sounds were available on another, and higher pitched sounds or vocal samples another.

Sound choice is also important for exercising the unique opportunities EMPIs offer in playing diverse sounds. Thus, we found dedicating time and thought to curating sounds helped enrich the therapeutic experience. This included choosing sounds consistent with clients' preferred musical styles, or with certain qualities that might reflect different feelings or moods.

Adding Extra Instruments

Adding extra instruments for the procedures described is possible. During improvisation in the therapy programme, we regularly offered the young people opportunities to play electric guitar, piano, and a drum kit alongside beats made or played with EMPIs, and we found this worked well. During

teaching, we often had up to eight EMPs playing simultaneously. While this often began chaotically, with no-one listening to each other and some disengaging altogether, all groups came together over the course of a session (or sessions) and were able to play together for long periods, resulting in group improvisations that some participants suggested were 'profound'.

In our experience, using five or more EMPs in *Approach'n'Play* required careful planning in device and sound choice, as well as speaker set-up (see below). It also seems EMPs that rely on keyboards or step sequencers, and thus require more confidence or familiarity with the equipment, are more challenging in this context. Implementing turntables in both client and trainee sessions proved particularly challenging given the time required to build familiarity and basic skills.

While we trialled the *Clip-Jamming* procedure with only one client and one EMP at a time, group participation should be possible. However, this would require a more complex set-up, such as another controller like the APC Keys 25 connected to a second computer with Ableton Live (or similar software capable of triggering loops), where both computers are linked via MIDI or another form of timing synchronisation. It would also be possible to connect a hardware sampler capable of triggering loops (such as a Roland SP-404) to a computer via MIDI. However, facilitating *Clip-Jamming* with multiple EMPs would again involve careful sound choice considerations.

Adding extra instruments, acoustic or electronic, to a *MIDI-Linked Jamming* set-up is entirely possible. However, EMPs not connected via MIDI would be best played in the moment, as syncing pre-programmed patterns without MIDI can be challenging. Again, sound choice should be considered.

Speaker Set-up

We discovered that strategic speaker set-up could considerably enhance group improvisation with EMPs. Our initial studio set-up had speakers placed side-by-side at the far end of the room. However, during improvisations, it became apparent that this placement made it difficult for participants to know which sounds they were making, and thus distinguish their musical contributions from the rest of the group. To address this, we moved the speakers closer to the participants; separated speakers, placing opposite each other on either side of the desks; and panned different EMPs to different speakers. The panning function, available on most physical mixers and DAWs, allowed us to direct the output of particular EMPs to the left, or right speaker only. When using four EMPs, for example, this meant the sound of two EMPs came out of the right speaker, the other two from the left speaker. This set-up allowed us to partially separate sounds coming from different EMPs and position these sounds much closer to those playing them. The benefits were immediately noticeable to all participants, and significantly reduced issues with sound differentiation.

Panning left and right does have limitations. When using more than two EMPs, there will always be some sharing of speakers between participants. However, when strategically combined with speaker placement, panning can significantly enhance the musical experience.

Conclusion

Music technology has long been used in music therapy practice, yet there remains few practical descriptions for

practitioners wanting to incorporate it in their practice. This article has aimed to inform discourse, teaching, and practice in this area. The authors present three procedures for facilitating music therapy improvisation that are positioned within the cultural framework of beat making, a tradition rooted in Hip Hop culture that centres on music technology in both composition and performance. To do so, we have drawn on our own experiences exploring the integration of beat making in music therapy practice and teaching. As a result, each of the three improvisation procedures presented employ common equipment and musical practices indigenous to beat-based music cultures. Some procedures afforded opportunities for young people to explore their own musical identities or affiliations with these cultures, while others introduced students to practices and aesthetics central to many contemporary music cultures. In presenting these three improvisation procedures, we make several suggestions for implementation in practice, including equipment, group size, sound choice, room set up, and facilitation. We argue that integrating beat making into contemporary music therapy practices is not an option, but rather essential. However, several challenges are also presented for readers' consideration. We suggest that the three improvisation procedures presented are capable of exercising many of the unique benefits of beat making and have considerable potential for integration into contemporary music therapy practices. It is argued that practice which centres such music traditions are important for therapists, and the field in general, in order to remain connected to contemporary music cultures. The accounts of equipment, set-up, procedures, and key considerations in this paper aim to provide music therapists a tangible resource for developing teaching materials and session plans to this end.

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