APPROACHES

ARTICLE

Utilising musical microanalysis and phenomenology to enhance understanding of the impact of improvisational music psychotherapy on self-efficacy for a client with depression and anxiety

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ABSTRACT

The purpose of this mixed methods study was to understand how a client's self-efficacy, defined as their perception of their own capability to achieve goals, is impacted by improvisational music psychotherapy conducted using MIDI instruments. Data was collected from session transcripts, several interviews with the client (Sara), and musical data. The musical microanalysis used the Music Therapy, MIDI, and MIR toolboxes within MATLAB. The collaborative data analysis incorporated the client's perspective. Results showed that the client's self-efficacy was influenced through multiple experiences within music psychotherapy including experiences of self-awareness and self-care; being confident and ready for change; growth and expansion outside of therapy; development and use of coping skills; and mastery and joy. By using musical microanalysis, results also indicated that certain musical features were linked to the client's imagery, mood states, and experiences of self-efficacy. The research gives an example of how to utilise musical microanalysis to enhance the understanding of therapeutic change and processes.

AUTHOR BIOGRAPHIES

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Sara Petrie benefited significantly from music therapy and wanted to share her experience for the sake of the profession and future music therapy clients. [sarapetrie26@gmail.com] **Heidi Ahonen**, Ph.D, RP, MTA, FAMI. Professor of Music Therapy. Director of Manfred and Penny Conrad Institute for Music Therapy Research. [hahonen@wlu.ca]

INTRODUCTION

The motivation for this study came from Laura's clinical music psychotherapy work with a client, Sara. As a clinical research team, we became curious about how and why her self-efficacy was changing within music psychotherapy. By conducting a study in which self-efficacy could be viewed through musical microanalysis, we hoped to understand what it looked like and sounded like in improvised music analysed with musical microanalysis. The research questions included: (1) How can music psychotherapy influence the self-efficacy of a client with anxiety and depression? (2) How can musical microanalysis enhance the understanding of therapeutic processes and change? (3) What is Sara's perspective on meaningful moments that influenced her self-efficacy during music psychotherapy improvisations? (4) What are the important features of improvisational music psychotherapy that contribute to the development of Sara's self-efficacy?

LITERATURE REVIEW

There is a dearth of literature covering the topic of the influence of music therapy or music psychotherapy on self-efficacy. The term is defined by Gallagher (2012) as "people's perceptions of their capability to execute the actions necessary to achieve a desired goal" (p. 314). Bandura suggests that self-efficacy has a significant impact on an individual's coping ability, particularly by promoting motivation (Bandura & Locke, 2003). According to Gallagher (2012), self-efficacy can be developed through five different mechanisms: "mastery experiences, modeling/vicarious experiences, imagined experiences, social persuasion, and somatic/emotional cues" (p. 315). Reeve (2015) similarly wrote about how self-efficacy is developed, discussing four experiences from which it can originate. These four, similar to Gallagher's five mechanisms, are: personal experiences of a particular task, observation of others' experiences with similar tasks, verbal persuasion from others, and one's physiological state.

While there is limited research on the effects of music psychotherapy on self-efficacy, there are studies indicating that other music activities have a positive effect on self-efficacy (Hohmann et al., 2017; Hovey, 2013; Yun & Kim, 2013). Hovey's (2013) study assessed how aesthetic therapy including musical activities influenced the self-efficacy of patients with schizophrenia. A parallel is drawn between the present study and Hovey's (2013) research in which it was noted that "those with higher levels of self-efficacy are likely to take on more challenging tasks" (p. NP3).

Self-esteem is similar to, though not exactly the same as, self-efficacy. Rolvsjord (2010) describes the difference between the two concepts, suggesting that "self-efficacy is concerned with judgments of personal capability, whereas self-esteem is concerned with judgments of self-worth" (p. 119). Branden (2006) wrote that self-esteem is "the disposition to experience oneself as being competent to cope with the basic challenges of life, and as being worthy of happiness" (p. 238). With these two definitions of self-esteem, it could be interpreted that self-efficacy is an element within self-esteem. Ryan and Deci (2017) wrote about two different types of self-esteem: contingent self-esteem, which fluctuates depending on whether one meets standards and expectations that have developed in the self; and true self-esteem, which is more stable and reliant on one's intrinsic sense of worth. One's contingent self-esteem, due to its fluid nature, would be easily influenced by experiences of mastery in music psychotherapy.

In various quantitative studies, music therapy has been shown to increase self-esteem in a variety of client populations, including academically stressed adolescents (Sharma & Jagdev, 2012), Chinese prisoners (Chen et al., 2016), and adolescents who have been sexually abused (Clendenon-Wallen, 1991). A qualitative study was used to demonstrate similar results in young adults with learning disabilities (Pavlicevic et al., 2014). Rolvsjord (2010) presented and analysed a case study in which music therapy was shown to contribute to the development of self-esteem in a young female client diagnosed with borderline personality disorder. Chang et al.'s (2018) research demonstrated that a music creation programme, in which participants created and performed meaningful music and songs, had a positive impact on the self-esteem of participants who had severe mental illness. It has also been indicated that a combination of creative arts therapies can be used to increase the self-esteem levels of college students (Yücesan & Şendurur, 2018). In a review of literature, Bungay and Vella-Burrows (2013) found that engagement in creative activities boosts self-esteem and confidence in young people.

Lawendowski and Bieleninik (2017) conducted a literature review of music therapy's influence on identity and self-esteem, and found that music therapy has a positive impact on both. A meta-synthesis of music therapy service users' experiences in mental health care, described that music therapy can aid in the development of identity, self-esteem, and self-confidence (Solli et al., 2013). Shin (2011) conducted a study to assess how participation in a particular music program influenced students' self-esteem. The results of this study showed that self-esteem was positively influenced by participating in the program and found four important factors that contributed to the development: the safety and positivity of the environment, encouragement from the music teachers, easy access to accomplishment, and the final performance. All four of these features can easily be translated into a therapy situation and could be taken into consideration when the therapist aims to bolster the self-esteem of a client, thereby also increasing the client's self-efficacy.

METHODOLOGY

The epistemological viewpoints of this abductive study were inspired by Van Manen's (1990) phenomenological inquiry in which the researcher can only know about the participant's lived experience through what the participant shares about the experience and through the researcher's observations. Data collected were approached with Van Manen's (1990) phenomenological lens in order to deeply understand Sara's rich, lived experience, and to enhance the depth of detail in the final interpretation of the qualitative data. A mixed-methods approach combining qualitative, phenomenological aspects of Sara's experience and quantitative, musical microanalysis was chosen to provide the most accurate analysis of musical qualities and self-efficacy while also staying true to Sara's perspectives and ideas. A convergent parallel design was used to collect and interpret the quantitative and qualitative data at the same time (Burns & Masko, 2016). By using both quantitative and qualitative research, this study is both empirically discovering data and creating new knowledge from the researcher's and participant's lived experiences.

Data collection

Sara was self-referred to Wilfrid Laurier University's music therapy clinic with Laura, the music therapist, because she was struggling with anxiety and depression and wanted to develop her self-confidence and become more comfortable in new situations. Therefore, these became the goals of the music psychotherapy process. After ten initial sessions, the clinical research team decided to conduct a case study based on her improvisational clinical work and ethical approval was granted by the Wilfrid Laurier University Research Ethics Board. During the sessions, integrative improvisational music psychotherapy (Erkkilä et al., 2011) was conducted, using a treatment plan developed specifically for Sara and aiming to achieve goals that were laid out by her and Laura together. Sessions often began with a verbal check-in to allow Sara to share anything which was important to her that had happened since the last session. Usually a theme for the session would arise from the check-in. Based on the theme, Laura and Sara began improvising. Sara would choose an instrument that she felt best represented the theme and would also choose an instrument for Laura to play which she felt would best complement her playing.

Data were collected through multiple methods. The improvisations were conducted using equipment in the Manfred and Penny Conrad Institute for Music Therapy Research Improvisation Laboratory. This included MalletKat instruments (digital xylophones) and MIDI keyboards. However, other acoustic and percussion instruments were also present in order to allow the therapeutic process to continue in a way that encouraged Sara to express herself anyway she wanted. However, Sara preferred to play the midi-instruments and djembe drums. Improvisations conducted on Improvisation Laboratory instruments were first recorded on the computer using Logic Pro software that provided audio recordings of improvisations, including the possibility to separately play back the therapist's and client's playing, generate notation of the music, and export the audio to various digital forms. Each of the sessions were video and audio recorded to provide another qualitative source of data. After each session, Laura, music psychotherapist, wrote detailed clinical notes regarding her own feelings, interpretations, and reflections about the session. The sessions were discussed with clinical supervisor, Linda Gambell and research supervisor, Heidi Ahonen. Upon completion of six sessions, Sara was engaged in an open-ended, in-depth interview about her experiences of music psychotherapy. Laura asked her to describe the meaningful moments she experienced within the therapy and to explain why they were significant to her. This interview was transcribed for ease of analysis. Based on this interview, four improvisations which were the most meaningful to Sara were selected for further investigation. After this Sara was asked to conduct an adapted version of Ferrara's (1984, 1991) analysis which will be described in detail in the next section. After this Sara, Laura, and Heidi met several times to discuss Sara's images and their meaning for her.

Data analysis and interpretation

Data from interviews, session transcripts, and session notes were analysed using phenomenological coding techniques, including the collection of themes, categories, and important quotes. Categories were found by indicating multiple quotes with similar topics or meanings. These categories were then collated to create more general themes. The finding of themes and categories relating to Sara's self-

efficacy and her music making was a vital aspect of the data analysis in order to understand the relationship between the two. This analysis involved a process of reflecting on the essential themes which characterised Sara's lived experience and observing each significant moment from multiple perspectives. Session notes, recordings, and interview/session transcripts were reviewed multiple times. As for the further analysis of the session and interview material, the research team chose four improvisations that were most relevant, meaningful, and significant for Sara's therapeutic process. The improvisations were chosen based on the discussion that came after the improvisations and their contribution to Sara's goal achievement. These improvisations were then listened to and analysed by Sara, utilising an adapted version of Ferrara's (1984, 1991) musical analysis technique (Ahonen & Houde, 2009).

Photograph 1: Equipment in the Manfred and Penny Conrad Institute of Music Therapy Research Laboratory

Open listening	Write down or draw your responses, including any impressions, feelings, images, body sensations.
Listening for semantic meaning	What is the mood? What is the atmosphere? How does it make you feel?
Listening for ontological meaning	What, as a composer are you saying with this music?
Open listening	What do you hear now after the four listenings? What are your thoughts and feelings? What is the meaning? What could be a title of this improvisation?

Table 1: Adapted from Ferrara 1984, 1991 by Heidi Ahonen for the purposes of this study

Sara was first asked to write down or draw her subjective responses, including any impressions, feelings, images, or body sensations. After that she was encouraged to describe the meaning of the music, such as its mood or atmosphere, and what the composer may have been trying to say with her music. In the end, she was asked to summarise her thoughts, for example, by giving the improvisation a title and theme.

As a result of Ferrara's analysis Sara generated more data and particular themes while describing her images, feelings and body sensations, stories, and drawings. When experiencing her imagery, Sara was able to express them using markers, pencil crayons, wax crayons, pen or pencil, and verbally (which the therapist would notate). Sara's themes were further discussed together in the research team meetings and explored through musical microanalysis which was conducted by utilising the Music Therapy Toolbox (Erkkilä, 2007; Erkkilä et al., 2004), MIDI toolbox (Eerola & Toiviainen, 2016), and MIR toolbox (Lartillot, 2019) within MATLAB. The purpose of microanalysis was to investigate if and how the most significant elements of Sara's most important themes were also visible in the improvised music, and if musical analysis could enhance the understanding of therapeutic change and therapeutic processes. By analysing musical elements including pitch, rhythm, and dynamics within both the therapist's and Sara's music, the research team could observe features of the therapeutic relationship and musical dialogues, as well as changes across time in Sara's music.

The following results first introduce descriptions of Sara's images, the musical microanalysis of the improvisations, and the clinical significance of each. The results section is followed by Discussion and Integration in which the characteristics of the descriptive phenomenological therapeutic process are integrated with musical analysis.

RESULTS

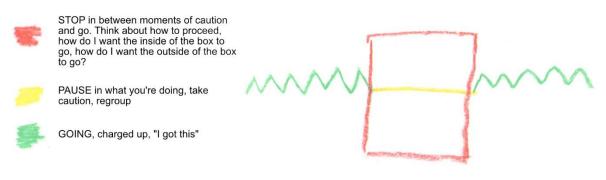### Image 1 − "The battles of give and take"

Image 1: Sara's imagery of a moment in improvisation #1

While listening to the recording of this first improvisation, Sara described her imagery and the feelings that went along with it in the following way:

It would be like that outside of the box thing where you're feeling tension and you don't know if you really want to do it but then you also feel like you want to take the leap of faith and give it a try. You have a little tension with you because you're not sure how it's going to go but then when you give it a try you're like 'oh that wasn't so bad' and you're releasing the tension. It's kind of like that give and take thing.

While creating this image, during Ferrara's analysis, Sara emphasised the significance of the traffic light colours; each one held particular meaning. The red rectangle represented the "outside the box" concept of which Sara frequently spoke. While inside it, she could go slow, take caution, and breathe deeply, as represented by the yellow line. The green jagged line represented the moments Sara pushed herself to be outside her box, trying new things that she felt less comfortable with and the following realisation that it was not "so bad". This image was derived from a moment in the improvisation in which there was a brief silence. Sara felt that this silence was a safe zone in which she stepped back into her box to regain control before emerging again into less familiar territory. While the image was drawn based on one brief moment of the improvisation, Sara's give and take imagery was representative of the overall listening experience.
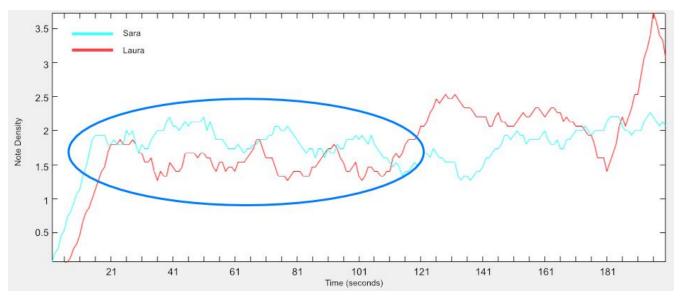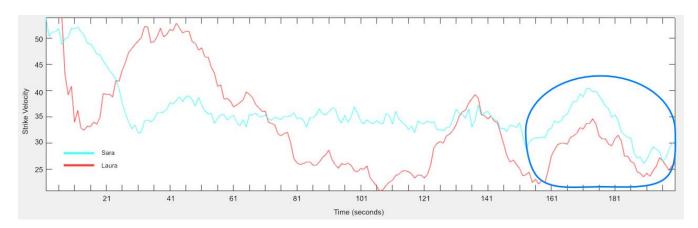
Musical analysis – Therapeutic relationship
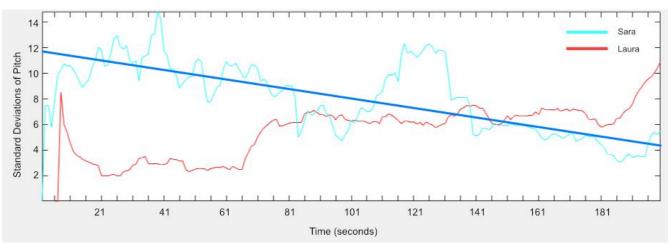

Figure 1: Note density in improvisation #1

One can see clearly in Figure 1 that there is dialogue, communication, and connection between therapist (red) and client (blue) as the two lines demonstrate similar but offset undulating patterns. Perhaps this is the give and take connection that Sara references in the title that she gave to the improvisation. This experience of connection, dialogue, and communication between therapist and client suggests an experience of social persuasion in which "the encouragement or discouragement of others can help shape our beliefs about our capabilities" (Gallagher, 2012, p. 316). The therapist uses the musical dialogue to encourage Sara to explore and try new things, to step out of her box.

Sara's imagery of being inside or outside of the box appears to correspond with her desire to become more comfortable in new situations, a recurrent theme of her therapeutic process, and an important element of her self-efficacy.

Figure 2: Mean velocity in improvisation #1

In Figure 2, one can see that Laura (red) follows Sara (blue) as she leads an increase in dynamics and then Sara follows as Laura leads a decrease in dynamic level. This happens at the end of the improvisation and prior to that there appeared to be a lack of connection in velocity (the strength with which the mallet struck the marimba key or the finger pressed the piano key) as Laura varied her dynamics throughout and Sara did not respond, staying relatively stable. It could be that once Sara became free enough after having tried "something and realised it's good", she felt safe now to explore and to form that connection with the therapist. According to Gallagher (2012) experiences of mastery are one of the most effective methods for the development of self-efficacy. Sara's image in which she overcame a fear of trying something new and successfully completed a task indicates an experience of mastery which would in turn boost her self-efficacy. Perhaps the dialogue that occurred earlier in the improvisation in the density window (Figure 1) allowed Sara to feel secure enough to try something new with velocity, thus contributing to her experience of mastery.

Musical analysis – Musical elements

Figure 3: Pitch variance in improvisation #1

One can see that the variability of pitch (Figure 3) starts relatively high and overall decreases throughout the improvisation. According to Snape (2019), "the more agitated and nervous a participant felt, the wider the pitch range they used whilst improvising" (p. 147). Based on Snape's findings, Sara's decrease in pitch variance could suggest a decrease in tension as she became more comfortable and confident in the situation. These physiological cues are also thought to contribute to a sense of efficacy or inefficacy, as tension and discomfort can influence a person's beliefs about their own ability to achieve certain tasks (Gallagher, 2012; Reeve, 2015). Sara experienced those same somatic cues while listening to the recording of her own improvisation. She described feeling aching muscles along with tension and release. Sara's tension, illustrated by pitch variance, gradually decreased throughout the dialogue referenced in Figure 1 and then increased significantly at the time when that form of dialogue ended around 116 seconds. As Sara finds that the particular dialogue has come to an end, this loss of connection increased her anxiety and pitch variance. Sara quickly became comfortable in the new situation and her overall pitch variance continued to decrease.

In her description of her imagery for this improvisation, Sara discussed communication skills, which, when she believes in her ability to use them effectively, are an important part of her self-efficacy. She said,

> Communication is going so well, and then maybe it stops going so well and you have to work through it to get it to be better again. Communication is a really good word and you have to have communication. If you communicate better with someone, you're obviously going to have a better outcome than if you don't. You can have music therapy to work on your goals in the communication area to then maybe put your communication skills into use outside of music therapy.

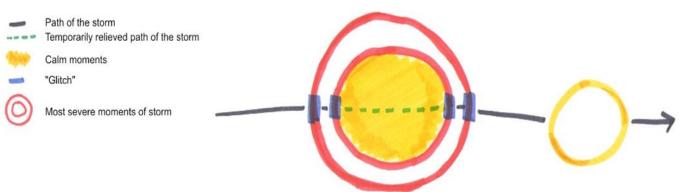## Image 2 – "Life adventures in a storm"

Image 2: Sara's imagery of improvisation #5

While listening back to this recorded improvisation, Sara described the image of a storm, during which her anxiety rose, her mood changed, her heart raced, and her breathing became heavier. The storm travelled along a path and could be seen to have multiple distinct areas. In the centre or the "eye" of the storm there was a sense of calm where the storm abated, surrounding the eye was the most severe portion of the storm where anxiety was highest. In Image 2, one can see the blue lines which are described as "glitches". Sara described these moments as the occurrence of an event, emotion, or
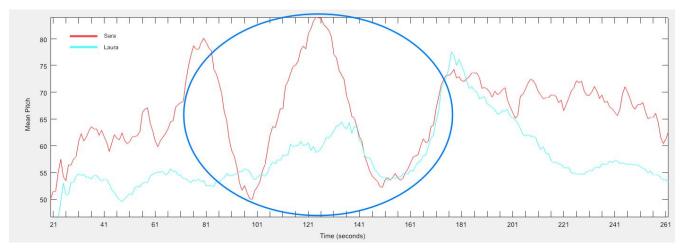
coping skill which would trigger a change for the worse or for the better.

Sara described the onset of a storm in the following way:

> I know something's happening in my body, but maybe I need to pinpoint more of how my body feels and the symptoms of when it's coming. Instead of 'wham, it's here', noticing signals in the body that says the storm is coming.

In this instance, Sara described the phenomenon discussed by Reeve (2015) who wrote that "an abnormal physiological state is a private, yet attention-getting, message that contributes to one's sense of inefficacy" (p. 275). Sara began to understand that her physiological state could influence her perceived ability to cope with difficult situations, such as storms. Music psychotherapy assisted Sara in understanding what signals her body was sending to her and knowing what this meant for her self-efficacy.

Musical analysis – Therapeutic relationship

Using MATLAB, very little was found in the way of musical connection between therapist and client in this improvisation. In this case it is considered apparent that Sara was likely displaying the kind of musical expression described by Jackson (2013) who wrote that depressed and anxious clients "may exhibit difficulty in musically interacting with others, and may only mimic others' playing, or even play in a manner that is completely disconnected and unresponsive to others" (p. 340). In this improvisation, Sara described being in a storm during which her anxiety is at its highest. In describing the storm Sara suggested that it "goes with the anxiety and the depression where it's kind of fearful and you feel alone". When storms occur, Sara feels that she wants to close herself in her basement or sleep through it, both being situations in which she would be alone and isolated. Perhaps the lack of musical connection between Sara and Laura is representative of the aloneness that Sara feels during literal and metaphorical storms.

Musical analysis – Musical elements

Figure 4: Mean pitch in improvisation #5

While listening to this recording, Sara described higher pitch notes as instilling calm and happiness, and low notes as being representative of dark grey colours and gloomy feelings. This interpretation of the meaning of various pitch ranges is supported by Snape's (2019) findings which suggest that "when depressed clients improvised, if they felt sad they played lower, darker notes, […] when they felt affectionate, they played higher, brighter notes" (pp. 149-150). In her image, the storm passes through two particularly severe moments with a period of calm in between them. In Figure 4 one can see that there are two particularly low valleys, representing lower average pitch, with a significantly high peak in between them – the eye of the storm.
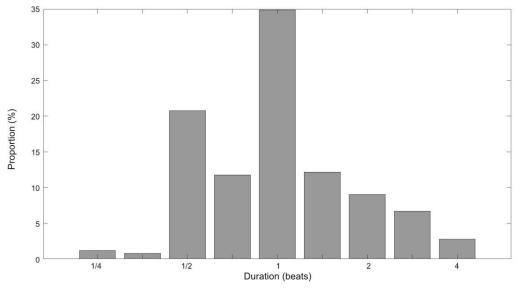

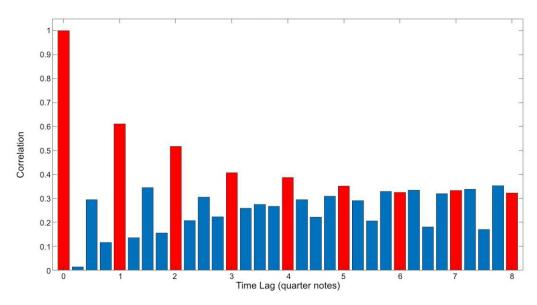**Figure 5:** Distribution of note durations in improvisation #5

Figure 6: Autocorrelation of onset times in improvisation #5

In Figure 5 one can see that Sara played proportionally more quarter notes and eighth notes than other note durations. (Quarter notes and eighth notes were used as the measure of rhythm based on the capabilities of the MIDI toolbox software.) This indicates a steady pulse and a sense of security in

rhythm. In Figure 6 one can see that the onset of Sara's notes fell predominantly on the beat (represented by the red bars) and on off-beats (represented by the middle of the blue bars) as determined by the software. The fact that this trend begins to become less clear around 5 quarter notes could indicate that although Sara played a steady repeating pulse, it was not a consistent tempo, perhaps gradually slowing or speeding up. Sara's steady rhythmic pattern including quarter notes and eighth notes could be seen as indicative of her mood state as, according to Snape (2019) "depressed participants tended to play in a more stable rhythm than healthy participants when they were describing their current feelings" (p. 38). Kenneth Bruscia (1987) made an interpretation as to why this may be the case, suggesting that

> pulse gives security, stability, predictability, and a reassurance that instinctual forces or energy will not become overwhelming or disappear. The pulse provides a 'ground' that holds, supports, controls, and equalizes energy and drives. In doing so, pulse serves to ward off primal anxiety and fears of overstimulation. (Bruscia, 1987, p. 451)

In Sara's case, a storm is a time in which primal anxiety tends to dominate, and so by playing with a steady pulse she was remaining in a place of security and stability, ensuring that she will not be overwhelmed by fear and anxiety.

Image 3 – "Love wins in miracles"

Image 3: Sara's imagery of improvisation #6

While listening to this recording, Sara described feelings which reminded her of the death of her grandmother. Sara's grandmother passed away a few weeks before this session and coping with her grief became a significant part of the therapeutic process. This recording returned Sara to many of the same feelings she was experiencing at the time of its creation. Sara experienced several negative emotions, typical of people suffering a loss, including sadness, anxiety, confusion, exhaustion, frustration, speechlessness, and loneliness. She also experienced some positive emotions while listening and working through her grief, including togetherness, pride, determination, support, and focus.

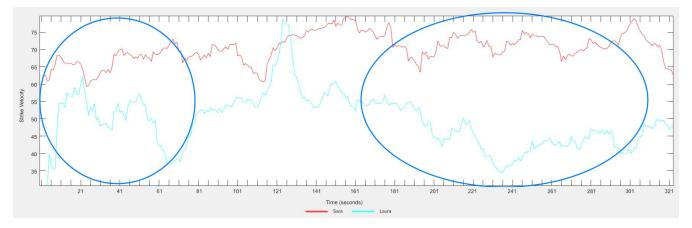*Musical analysis – Therapeutic relationship*

Figure 7: Mean velocity in improvisation #6

In Figure 7, Sara's music is represented by the red line and Laura's music is represented by the blue line. When observing how the two lines of music interact with each other, one can interpret the relationship between the two musicians. One can see in the two circled areas that both lines are following similar contours, seeing peaks and valleys occurring between them simultaneously. This indicates a significant level of connection between therapist and client, particularly because it is difficult to tell who is leading each of the changes in velocity. It is not simply that one is imitating the other; there is two-sided dialogue and connection. Rolvsjord (2010) discussed the importance of relational aspects when it comes to the development of self-efficacy. She wrote that "together with others it is possible to reach into the zone of proximal development and to develop and achieve better than you thought you could" (p. 118).

These two particular instances may be the moments in which Sara felt the positive feelings of support and togetherness.
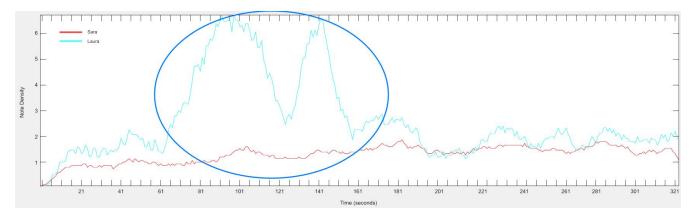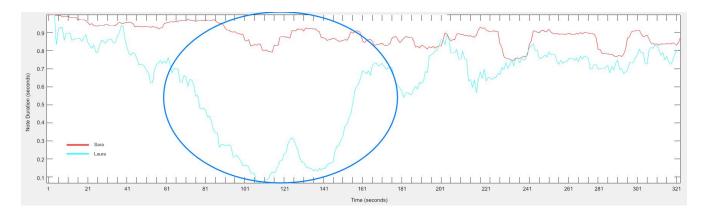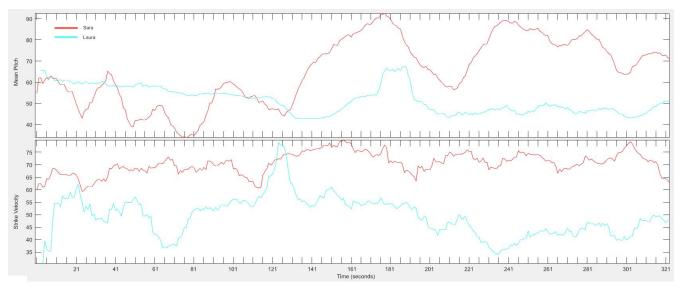

Figure 8: Note density in improvisation #6

Figure 9: Mean note duration in improvisation #6

In Figures 8 and 9, Laura's music (blue) goes to extremes and Sara (red) follows with only very minor changes in the density and mean duration of her music. Gallagher (2012) suggested that modelling is one way that an individual can develop self-efficacy. By observing the changes that others are able to make, one's beliefs about one's own ability to make similar changes is influenced. In this case density and duration were both very stable traits in Sara's music and drastic change in rhythmic style was considered an unfamiliar task. The observation of Laura's changes allowed Sara to attempt change in her own music.

Musical analysis – Musical elements

Figure 10: Mean pitch and mean velocity in improvisation #6

It can be seen in Figure 10 that Sara's mean pitch and velocity (red) follow a similar contour, although the variation in the mean velocity is significantly reduced in amplitude. Bruscia (1987) suggests that volume "can symbolize force, power, strength, size, and commitment" (p. 454). With this interpretation combined with Snape's (2019) findings that mean pitch can represent a person's mood state, it could be understood that when Sara's pitch is low and her mood state is sadder, she would be more quiet and timid, feeling less power and strength; and when her pitch is higher, her mood state

happier, her self-efficacy would be higher and therefore beliefs in her own force and commitment would also increase. Of course, this is not necessarily the case with all clients.
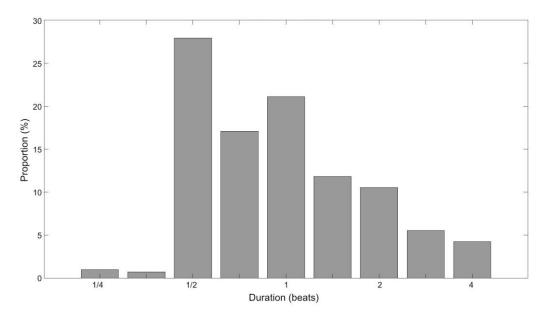

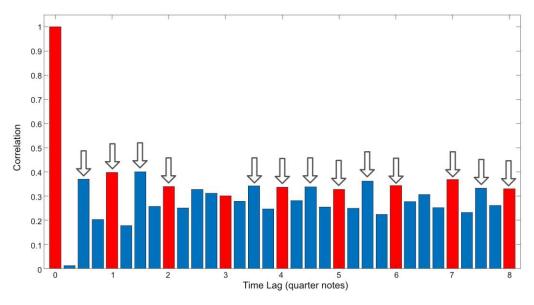**Figure 11:** Distribution of note duration in improvisation #6

Figure 12: Autocorrelation of onset times in improvisation #6

Rhythm was an important musical element in Sara's music, and Bruscia (1987) wrote about the significance of sameness in rhythm:

> Keeping what one has, and not accepting every change or new idea that comes along builds a secure foundation for the present and a clear direction for the future. However, when sameness is preserved rigidly and urgently, there is no security in the present and no direction for the future. (Bruscia, 1987, p. 432)

Sara's rhythmic sameness was a key feature of the therapeutic process. In the beginning stages, she played the same rhythmic patterns repeatedly throughout improvisations and over time. This sameness verged on rigid and urgent, a lack of confidence in her ability to explore change and a desperate need to feel secure in the present. As Sara's therapy process continued, her sameness gradually shifted, beginning to find balance and change.

While listening to this improvisation, Sara thought about the loss of her grandmother. When coping with a loss so significant, it is important to feel grounded and secure in the present moment, which Sara allowed herself to feel by creating a steadying rhythmic pulse. With Bruscia's ideas in mind it can also be seen that by holding on to her steady pulse and not changing it, Sara developed an image of the future, looking towards coping mechanisms that she can use to navigate her way through a time of grief and loss.

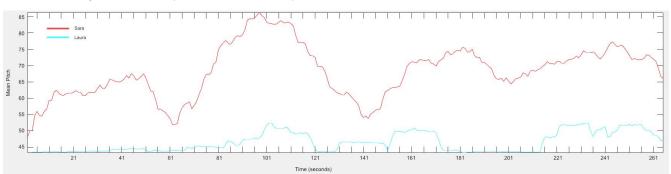## Image 4 – "Life's magical processes"

Image 4: Sara's imagery of improvisation #7

As I go into the happy place, I'm by myself trying to regroup but as I get more comfortable I allow others into it or allow myself to try new things. I'm lying by the pond, finished lunch, relaxed. I put my feet in the pond. Next time I'm more confident to go a bit deeper, and eventually I'm comfortable enough to swim and move to the fountain to let it shower over me like washing the bad stuff away and then I can swim which has good vibes. I feel like a different person when I leave this meadow place than when I came to it. Each time I go to the meadow

and each time I leave the meadow it's that much easier to deal with and handle situations and achieve the things I'm trying to accomplish.

This image is like my happy place. When I'm going through the storm or a difficult place is coming, I know that I can reach to this place. Like a light at the end of the tunnel. I always know that this is available to me.
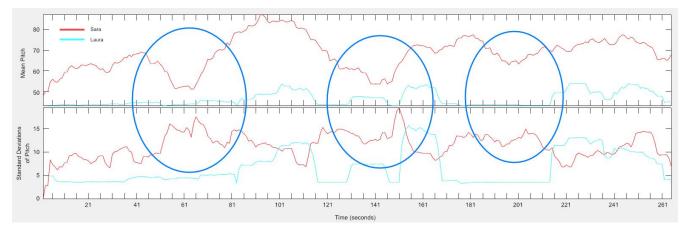
This image, which was created by a graphic artist during the data analysis phase according to Sara's detailed instructions about her imagery, could also be interpreted to represent the entire therapeutic process. Sara described a process in which she gradually submerges herself deeper into the pond, and entering and leaving the meadow. The meadow could be representative of the therapy environment and each time she leaves a therapy session "it's that much easier to deal with and handle situations and achieve the things I'm trying to accomplish". The pond could be representative of her personal experiences as she digs deeper and deeper into them, exploring emotions, feelings, struggles, and successes which will all allow her to achieve her therapeutic goals. Eventually she will reach the source (the fountain) and will be able to release herself from the things that are holding her back.

Musical analysis – Therapeutic relationship

Figure 13: Mean pitch in improvisation #7

Improvisation "provides a means of establishing contact with another person, identifying with him/her, experiencing empathy, exchanging ideas, and sharing feelings" (Bruscia, 1987, p. 560). This type of relationship is clear when looking at the mean pitch of improvisation #7 (Figure 13) as Laura's and Sara's music follow the same contour, changing and adjusting with each other; leading, following, and communicating. In this case, Sara's image was one in which she enters her happy place and emerges in a different state, feeling more confident in her abilities to cope with difficult situations and to achieve her personal goals. She gradually allows other people to enter her oasis, suggesting an increase in self-efficacy and the building and strengthening of relationships such as this one.

Musical analysis – Musical elements

Figure 14: Mean and standard deviation of pitch in improvisation #7

When observing mean pitch and pitch standard deviation or range together, one can see that as mean pitch decreases, pitch range rises and vice versa. There are three moments in particular where this was the case, indicated in the circled areas of Figure 14. Based on Snape's (2019) findings which suggest that low average pitch is representative of sadness and wide pitch range is indicative of tension, we wonder if these were three moments in which Sara's tension and sadness were heightened. This also correlates to her image as she described gradually walking deeper into the pond in the middle of the meadow. As she wades deeper into the pond, her anxiety becomes more pronounced, however each time she enters the pond and returns to shore, she becomes more confident in her ability, her self-efficacy is slightly increased. One's knowledge of one's own experiences with a particular task is one of many factors that can influence self-efficacy (Gallagher, 2012; Reeve, 2015). In this case, as Sara successfully enters the pond and copes with the anxiety it induces, her own ability to cope becomes clearer to her, thereby increasing her self-efficacy.
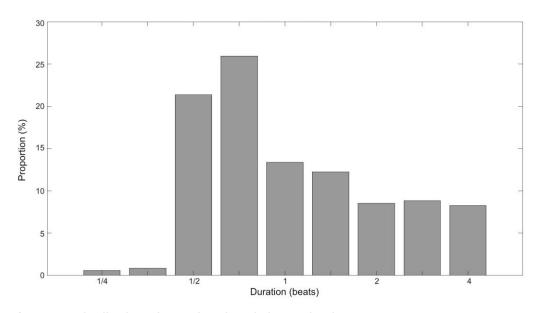

Figure 15: Distribution of note durations in improvisation #7

In Figure 15 one can see that Sara was predominantly playing notes that are between the length of an eighth note and a quarter note, which suggests that she was playing more complex rhythms than simply the basic beat (and while the fourth column does not represent dotted eighth notes as one might expect due to the use of a logarithmic scale, it represents notes that are between the length of an eighth note and a quarter note). This suggests rhythmic freedom and confidence to play more than just the basic beat. And although Sara was playing with more rhythmic freedom, one can see from Figure 16 that she was still playing within a two-beat measure structure as most of her onsets occurred on the beats. In Figure 17 one can see that the strongest autocorrelation within the beat gradually shifted, suggesting that the tempo was not steady, but the pulse was still clear.
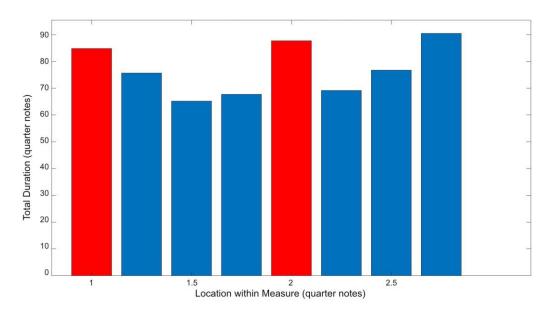

Figure 16: Distribution of note onsets in improvisation #7
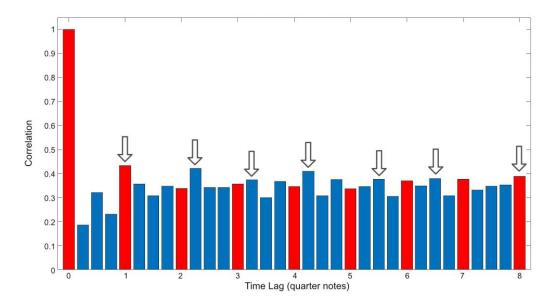

Figure 17: Autocorrelation of onset times in improvisation #7

In her imagery, Sara described a desire to move toward the fountain at the far edge of the pond which she knows will help improve her mental health. In order to do so however, Sara must allow herself to go deeper into the pond, eventually requiring her to swim. Bruscia (1987) described the meaning of rhythmic patterns, suggesting that "the patterns disturb the state of equilibrium or homeostasis, and therefore stimulate tension and the need for resolution. […] Safety is also not a matter of embeddedness, and therefore must be maintained by moving towards objects or away from objects" (p. 451). Sara now felt safe enough in the therapeutic environment to allow herself to take risks and move away from the security of a basic pulse and towards her fountain at the edge of the pond.

DISCUSSION AND INTEGRATION: REFLECTING ON THE THERAPEUTIC PROCESS

Image 5 illustrates the phenomenological themes, codes, and categories within the image of a tree that was created by the researchers to illustrate the different characteristics of Sara's therapeutic process and the qualitative data-analysis results from transcripts of sessions, the final interview, and the therapist's session notes. For Sara's therapeutic growth of self-efficacy to occur within a therapeutic environment, three factors needed to be present: flexibility, safety, and a therapeutic relationship. Within the nutritious soil, not yet visible to her outside world, grow the roots or the interventions, both verbal and musical. From these roots begins to grow the tree itself, observable by all outside of the therapy environment. The trunk of the tree represents the key factors of Sara's music therapy experience which contributed to a development of self-efficacy. These are noted within each of the five main branches. They are: self-awareness and self-care, being confident and ready, growth and expansion, coping skills, and mastery and joy. In the space surrounding the tree, one can see the subcategories within each of the five key factors of Sara's experience. These subcategories represent smaller groups of codes that were extracted from the data and provide detail and context for the main branches of the tree. In this chapter, the descriptive phenomenological characteristics of Sara's therapeutic process will be reflected and integrated with the musical microanalysis.

The soil – The therapeutic environment

Sara identified the following elements of the therapy process which influenced her self-efficacy and allowed it to grow: the therapeutic environment, specific interventions, and music. During the therapy process, Sara often discussed her appreciation for the flexibility of the sessions. Each day the activities occurring within the therapy session were adjusted based on her current state. Sara's moment-to-moment needs were addressed by working together to create each therapy session in the way most suited to her current state. A non-directive attitude was thereby achieved, and the roots of Sara's self-efficacy were able to grow.

Another nutrient within the soil of the therapeutic environment was a feeling of safety. Sara felt that the music therapy space was a safe environment which was important to her because, as she said, "I always like to try new things in a safe environment before I try them in a bigger maybe a little

bit of a scary environment". It is important for an individual to feel safe before they can begin to develop their self-esteem or self-efficacy, thereby suggesting that bringing safety to every session is a vital part of the therapist's role. Having a safe place in which to learn, explore, make mistakes, and develop coping skills allowed Sara to satisfy the human need for safety and go on to address her need for self-esteem and self-efficacy.
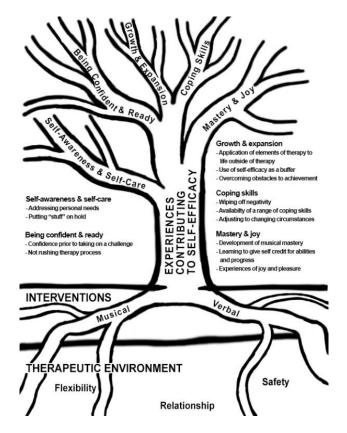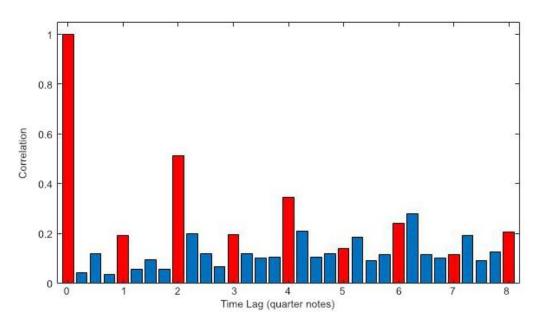

Image 5: Representation of themes and categories

Figure 18: Autocorrelation function of Laura's onset times in improvisation #5

A therapeutic relationship is one of unconditional positive regard in which the client feels validated by and important to the therapist. It is clear from Sara's descriptions of the therapeutic relationship that it enhanced the therapeutic environment and allowed self-efficacy to grow. Sara stated in the interview "I always value having someone that's outside of your friends' circle, your family circle". One can see in Figure 18 that Laura holds a steady 2/4 rhythm throughout improvisation #5 ("Life Adventures in a Storm"). In this case Laura's steady meter provided grounding and holding for Sara during the improvisation in which she felt isolated while dealing with a storm. Bruscia (1987) suggested that "when the rhythms fit into the measure, the meter provides reassurance that the energy states, drives, and impulses are occurring in the right place at the right time, and their significance is contained within an overall value system" (p. 452). The therapist's music held a relationship with Sara's by creating this metrical structure and providing reassurance that Sara was successfully coping with the anxiety caused by the storm.

The roots – The interventions

The next category that was considered relevant was Sara's descriptions of interventions that were used within the music psychotherapy process. Sara discussed the relationship between, and relative importance of, music and words in music psychotherapy. Although Sara felt that music psychotherapy "helps you in a different way than just talking to somebody", she also appreciated the sessions in which no music was made and the time was spent in conversation. By analysing Sara's description of an ideal balance between words and music, it was noted that she felt the most benefit when the two modalities were used to compliment and feed off each other. Sara described two particular styles of intervention which contributed in equal parts to the development of her self-efficacy. The first is "you do the therapy by using music", which implies that the music itself is the agent of change. The second is "doing the therapy and trying to find it musically", which implies a method involving verbal interventions followed by music to enforce concepts discussed.

The trunk and branches – The experiences contributing to self-efficacy

The tree itself represents the experiences that Sara had through music psychotherapy, which contributed to the growth of her self-efficacy. Five branches sprout from the trunk of the tree, each of them representing one of the five key experiences: self-awareness and self-care, being confident and ready, growth and expansion, coping skills, and mastery and joy.

The first branch of the tree of Sara's growing self-efficacy is *self-awareness and self-care*. These were important experiences in Sara's music psychotherapy journey. When she first started music psychotherapy, Sara had realised that "I can't just keep doing what I'm doing, because if I keep doing what I'm doing I'm not going to succeed in the way that I need to". She had begun to realise that she was not addressing her own needs enough and that this was influencing her ability to achieve her personal goals. Sara also demonstrated significant self-awareness while listening to improvisation #5 when she described the importance of understanding physiological symptoms and how they can affect her self-efficacy. These realisations were significant to Sara's growth because it emphasises that she was aware of her own needs and acknowledged that it was important to address them. In the

final interview, Sara stated "I'm choosing to work on myself finally and do the whole soul searching and figure out what's best for me". For Sara, working on herself included the goals that were addressed in music psychotherapy: improving self-efficacy and developing confidence in new situations, such as can be seen in improvisation #1. Part of this process included learning to prioritise what was most important to her mental health. Many times throughout sessions and the interview, Sara discussed the idea that she was putting "stuff" on hold to work on herself and that she had put her own "stuff" on hold for too long. By prioritising her mental health over things such as employment, Sara was boosting her belief in her own capabilities.

The next branch of the tree is *being confident and ready* before making any change or progress. It was important for Sara to experience feelings of confidence in her ability to succeed before she would take something on. She says that "if you're not ready and you're being forced to do something, you're going to react totally different than if you're confident and ready". There were times in her life that Sara felt forced, either by internal or external sources, to do something that she was not confident and ready for, such as finding a job. Sara came to realise that she had not been fully prepared for the job she held and that it was negatively affecting her mental health. She said, "I'm just not confident enough that if those unexpected things happen that I can pull through it". Until she had built up the self-efficacy to be able to handle any such events, she would not pursue a job. This need for confidence prior to taking on a challenge can also be seen in Image 1 when Sara described the significance of each of the colours. The green jagged line represents a moment in which Sara was feeling challenged as she has pushed herself outside of her comfort zone. However Sara needed time to prepare for those moments by breathing deeply and taking caution, represented by the red and yellow lines.

Another important branch of Sara's self-efficacy is her *growth and expansion*. This category includes all of Sara's experiences of applying elements of the therapy sessions to her life outside of the therapy, her use of self-efficacy as a buffer for when traumatic events happen, and overcoming obstacles to achievement. Sara shared that there were moments of learning and experimentation that she explored in the music psychotherapy space that felt good to her in a safe environment but would take further development of self-efficacy to explore in another environment. In the final interview she stated*: "My home would be my next safe place, and then certain great friends' places would be my next safe place, and then eventually it would just trickle out, and then eventually I'm in the middle of the city and then randomly I would feel comfortable doing stuff."*

A significant example of this is represented in Sara's quotation regarding communication in Image 1. She suggested that she used music psychotherapy as a safe environment in which to practice communication skills before putting them to the test outside of music psychotherapy. Gallagher (2012) suggested that individuals are more likely to approach perceived threats if they believe they are able to handle the situation, in other words, if they have a higher level of self-efficacy. In Sara's case, stepping outside of her comfort zone was less difficult to achieve within the therapy situation, and became more difficult as she went into each of the earlier mentioned locations. However, as her level of self-efficacy increased, Sara was able to expand her improved communication skills into other areas of her life.

Sara also felt that achieving her goals and developing her self-efficacy would be beneficial in situations in which her confidence and self-esteem are tested. Sara shared that she had experienced

traumatic events in the past and these events caused her confidence and self-esteem to "go backwards". She said, *"right now if it hits me, I'm getting pushed back and there's no resistance to it"*. By achieving her goal of developing her self-confidence and self-esteem, Sara understood that *"even if I get pushed back it won't affect me that much and I can still move forward"*. In image 3, Sara described how she dealt with both the loss of her grandmother, and the anniversary of the loss. These were both very difficult situations for her and yet the development of her self-efficacy allowed her to avoid being "pushed back" too far when the anniversary arrived.

Associated with growth and expansion is also the experience of overcoming obstacles and coping with what Sara considered to be mistakes. One obstacle to Sara's growth of self-efficacy was her fear of failure. Music was an ideal way to assist Sara in overcoming this obstacle to her growth. For example, during a particular improvisation, Sara felt that she played some wrong notes. In the discussion following this improvisation, Sara was pleased to realise that she had been able to continue playing after these accidental extra notes. Sara shared how this situation can be related to non-musical life events and how her reaction to mistakes had changed since she started music psychotherapy. The following is Sara's description of that improvisation in session 3.

> I usually get frazzled and then my walls come up. I'm like 'oh, I don't want to do this, it's too overwhelming, I don't know how to push through it'. And then I shut down and then I'm like 'OK now I have to go back to it a little bit later to figure out the solution'. Well, this time I just went on head-on without any breaks and kept on going and it turned out well. So that was actually pretty cool. I did a couple other notes than the stickers that we have on this thing but it's kind of like it did it on purpose because it could show me that 'you know what? You did do that, but you also didn't stop. Because you could have stopped the recording and said OK, well, whatever, we'll start again'. But no, I kept on moving. Ya, that is kind of like life too because you have a little glitch or a pause or a situation, like a death, like my Granny I guess, and how you push through. Before we started working together, I probably would have handled that death situation totally differently.

Nachmanovitch (1990) wrote a book chapter on the power of mistakes. He wrote that "the quirks and mishaps that one might be tempted to reject as 'bad data' are often the best" (p. 91). It was because of this musical "mistake" that Sara came to realise that she had grown to be able to cope in a more positive way with unforeseen situations.

Throughout the therapeutic process, Sara also discussed the development and use of various *coping skills.* Not only did she feel that music psychotherapy was valuable for the development of her coping skills, Sara appreciated that she was learning to combine various techniques, to choose the best coping skill for the situation, and to adapt to changing situations. One of the coping skills that Sara discussed most during her time spent with music psychotherapy was the ability to "wipe off" negativity. Sara spoke of a situation in which she asked for a friend's opinion of something and she was prepared for any response.

> Maybe what they're saying is true, maybe it's not, or maybe they're just giving you an idea to think about. But ultimately, you know you best. So if you think it's true, well then it's true because that means you're agreeing with it. If you don't and you think it could be true, then what are some steps that you could do to make it true? And if it's totally not a true statement, then it's kind of cool that you can learn to just wipe it off. And then as you're learning the different skills, it will determine if you can wipe things off faster and if it will bother you for less time than other things.

Sara demonstrated not only an awareness of the coping strategies she held, but also an awareness of how to effectively use those skills in the moment. She said, "it's just trying to figure out in those frustrating times when one coping skill doesn't work, how quickly can you add in one of your other ones to fix it?". This heightened level of self-awareness regarding coping strategies suggests also an increased belief in her own ability to implement an appropriate strategy when facing a difficult situation.

The final branch of Sara's tree of self-efficacy is experiences of *mastery and joy*. "Mastery experiences are the most effective method of developing self-efficacy beliefs" (Gallagher, 2012, p. 315) and therefore Sara's feelings of pride in her musical mastery were important indications of the development of her self-efficacy. In the interview, Sara stated "I knew a little bit of music stuff when I started but can you imagine now what I have? I might not be playing [the instruments] the right way, but I certainly know a lot more". On the drum, which was not used in the data collection sessions due to the inability to collect MIDI data, Sara went from simple exploration of sounds with no rhythmic stability to complex and creative rhythmic drumming over the course of the music psychotherapy process. On the xylophone or mallet instruments, she began the process with little willingness to explore the instrument and by the end of the sessions had a capacity to play melodically and rhythmically, using the entirety of the instrument's range. At the outset of music psychotherapy Sara did not use the keyboard or piano, however eventually she began using the instrument with stickers to dictate which notes she would use in each improvisation, thereby keeping it accessible and non-threatening

In the concluding interview, Sara and the researcher listened to two recordings of musical improvisations conducted on the MIDI instruments. The first recording they listened to was the very first one created in the research lab, and the second was the very last (which was not microanalysed in this study). Sara was then asked to describe what she noticed that was different between the two. Sara's response was as follows:

> I found that the second one was a little more put together than the first one. I think we were more together in what we were making than the first one, where it was a little more choppy. The first time I was more on one sound only, which is loud, which is kind of funny for me because I don't like being loud at all, but I guess with that I did. And then this one, it's that confidence thing right? I was way more confident, and I was able to put more into it. Whether it was more levels of loudness, like there was some quiet in there, some medium sound, and it's not

> just one tone, there's more levels to it which is pretty cool. I just thought the
> second one was a little more put together, like what an actual instrumental piece
> could have been like.

In this statement, Sara indicated that not only did the experiences of mastery contribute to her self-efficacy, but confidence contributes to what she considers to be more aesthetic musical performances. In this way, musical mastery and self-efficacy can be seen to develop simultaneously in a positive cyclic manner, continually contributing to the growth of the other.

Through music psychotherapy, Sara came to realise that there are times that she does not "give herself enough credit" for her abilities and for her progress. In the third session she said

> I actually am improving, more than I actually think sometimes. That's not a bad
> thing. That really is not a bad thing. So me thinking I'm taking little steps, but
> maybe I'm actually more on a medium or larger step and I'm just not really
> picking up on it. But maybe that is actually happening and it's not so much the
> small steps all the time; maybe I am doing those other ones too.

Sara broke away from a tendency to doubt her own progress when she realised the extent to which her musical mastery had developed. She acknowledged that "maybe in some areas that I think are lacking, maybe I'm just not giving myself enough credit". This statement indicated an improvement in self-efficacy as Sara realised that she had more internal resources and mastery than she was originally accounting for.

Another important element of the therapy process and contributor to self-efficacy are experiences of joy and pleasure. Sara clearly enjoyed making music and listening to the recordings of her own improvisations, stating "wow! I could dance to some of those!" after listening to a recording from the first session and a recording from the last session. Sara's choice of image 4 is also a significant example of her experiences of pleasure during music therapy. She described this image as her happy place, a place where she feels calm and relaxed. Gallagher (2012) wrote about the manner in which emotional cues can contribute to the development of self-efficacy, suggesting that "the extent to which individuals are emotionally/physiologically aroused can have minor effects on the level and strength of self-efficacy beliefs" (p. 316). Therefore, when Sara was in a positive and joyful state, it can be understood that this would have a positive impact on her self-efficacy.

CONCLUSION

The aim of this research study was to develop an understanding of how improvisational music psychotherapy influenced Sara's self-efficacy and how musical analysis of the improvisations could shed light on Sara's therapeutic process. The research questions were (1) What is Sara's perspective on meaningful moments that influenced her self-efficacy during music therapy improvisations? (2) What are the important features of improvisational music psychotherapy that contribute to the development of Sara's self-efficacy? (3) How can music psychotherapy influence the self-efficacy of a client with anxiety and depression? (4) How can musical microanalysis enhance the understanding of therapeutic processes and change?

Throughout the music psychotherapy sessions and the interview following her therapeutic process, Sara discussed several moments which influenced her self-efficacy. The main themes that Sara discussed regarding this topic were addressed in the discussion and integration section and were represented by the image of a tree. The five core experiences within music psychotherapy that contributed to Sara's self-efficacy were self-awareness and self-care, being confident and ready, coping skills, growth and expansion, and mastery and joy.

The most important features of improvisational music psychotherapy that contributed to the aforementioned experiences included the therapeutic environment and musical and verbal interventions. With the occurrence of flexibility, safety, and a positive relationship within the therapeutic environment, Sara was able to use the interventions in the way most suited to her needs.

The use of microanalysis tools allowed for an understanding of how Sara's meaningful moments and self-efficacy were represented in the music. Microanalysis of Sara's improvisation showed musical features which were interpreted as accurate representations of her imagery and interpretation of the music. However, some limitations do arise from this process as well. For example, any meaningful moments that occurred during improvisation with acoustic instruments could not be analysed in this way; and certain metrical analysis features may provide slightly skewed results due to an inability to detect tempo changes.

When considering the impact that these music psychotherapy sessions had on Sara, it should be taken into consideration that six sessions were conducted using MalletKats and MIDI keyboards. These instruments may not be readily accessible to most music therapists; however they could also contribute to therapeutic growth for clients. By using the MIDI music therapy toolbox to analyse the musical data in the MATLAB software and allowing the client to view the results, it can offer the client opportunities for self-confidence, pride, and empowerment. The software can also allow a considerable amount of data to be shown during the therapy session whereas a microanalysis by hand would take a long time before it could be accessible to the client. With the software, the client can see concrete data about the music they created and feel pride in how it looks and how it sounds. They may be able to notice differences in the analysis of their music as they progress in their therapy.

With a new understanding of a client's self-efficacy within music psychotherapy, one might be interested in future studies which consider how musical microanalysis might represent other elements of a client's therapeutic goals. It could also be interesting to explore how musical microanalysis could be used within the therapeutic process with the client during the process to assist with therapeutic change, as opposed to being used on completion of the therapeutic process to understand the changes that occurred for the client. It could also be interesting to use microanalysis as a clinical tool by the therapist themselves to inform how they interact in the session.

It is important to note that the results of this study may be influenced by the primary author's stance as both therapist and researcher. This could lead to confirmation bias in which the researcher interprets data in a way that confirms the hypothesis. In this study we tried our best to avoid this through peer review and regular clinical and research supervisions. Sara's perspective on this strengthened the validity of the research findings.

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Αξιοποιώντας τη μουσική μικροανάλυση και την φαινομενολογία για την βαθύτερη κατανόηση του αντίκτυπου της αυτοσχεδιαζόμενης μουσικής ψυχοθεραπείας στο αίσθημα αυτοαποτελεσματικότητας ασθενούς με κατάθλιψη και άγχος

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ΠΕΡΙΛΗΨΗ

Σκοπός της παρούσας έρευνας μεικτής μεθοδολογίας ήταν να μελετηθεί το πώς η αυτοσχεδιαζόμενη μουσική ψυχοθεραπεία που διεξάγεται μέσω της χρήσης ψηφιακής διεπαφής μουσικών οργάνων (MIDI) έχει αντίκτυπο στο αίσθημα αυτο-αποτελεσματικότητας ενός πελάτη, όπως αυτό ορίζεται σύμφωνα με την αντίληψή του πελάτη ως προς την ικανότητά του να επιτυγχάνει στόχους. Συγκεντρώθηκαν δεδομένα από τις μεταγραφές των συνεδριών, από αρκετές συνεντεύξεις με την πελάτισσα (Σάρα) καθώς και από μουσικές πληροφορίες. Στη μουσική μικροανάλυση έγινε χρήση των δεδομένων από τη μουσικοθεραπεία, τα MIDI και τα MIR εργαλεία εντός του MATLAB. Η συνεργατική ανάλυση των δεδομένων συμπεριέλαβε και την προοπτική της πελάτισσας. Τα αποτελέσματα έδειξαν ότι η το αίσθημα αυτο-αποτελεσματικότητας της πελάτισσας επηρεάστηκε από ποικίλες μουσικοθεραπευτικές εμπειρίες συμπεριλαμβανομένων των εμπειριών αυτεπίγνωσης και αυτο-φροντίδας, της αυτοπεποίθησης και της ετοιμότητας για αλλαγή, της ανάπτυξης και εξέλιξης εκτός θεραπευτικού πλαισίου, της ανάπτυξης των δεξιοτήτων αντιμετώπισης προβλημάτων και της αυτοκυριαρχίας και της χαράς. Μέσα από τη μουσική μικροανάλυση, φάνηκε ότι συγκεκριμένα μουσικά χαρακτηριστικά ήταν άμεσα συνδεδεμένα με τη φαντασία της πελάτισσας, τη διάθεσή της και τις εμπειρίες αυτο-αποτελεσματικότητάς της. Η έρευνα προσφέρει ένα παράδειγμα του πώς μπορεί να αξιοποιείται η μουσική μικροανάλυση για τη βαθύτερη κατανόηση της θεραπευτικής αλλαγής και των θεραπευτικών διαδικασιών.

ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ

κατάθλιψη, άγχος, ψυχική υγεία, αυτο-αποτελεσματικότητα, μουσική ψυχοθεραπεία