

Video micro analysis in music therapy research

a research workshop

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Video Micro Analysis in Music Therapy Research, a Research Workshop

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Introduction, shared

This presentation is based on three Ph.D. dissertations about music therapy interplay with children with severe functional limitations, including children with severe autism (Plahl 1999/2000; Holck 2002; Oldfield 2004). These children are typically socially withdrawn and also have considerable difficulties in the area of communication, verbal as well as nonverbal.

Because it can be very difficult to register communicative behaviour of these children in normal real-time observation, video can be an extremely useful tool for recording music therapy interplay, thus making it an object for analysis and reflection. Often it is necessary to analyse on the micro level, in order to register who is doing what, and when.

On the other hand, in practice only segments of a series of music therapy sessions can be micro-analysed. This means that an extensive selection process is required, whether by criteria of time or specific qualities. All research requires focus, and thus selection, but this process has great weight in video microanalysis.

By choosing video microanalysis, one chooses a method that will provide certain types of knowledge and not others. But with music therapy's many facets, such as client variation, approach and relationships to medical, social and psychological fields, different research approaches are needed to cover the whole area (Aldridge 1996).

The delineation between quantitative and qualitative research refers to quantitative and qualitative data and methods, respectively. However, in practice many studies contain both data types. Therefore it is more meaningful to distinguish between types of knowledge that are accessible within a given subject or method (epistemology).

In quantitative video research, the effect of music therapy is typically shown, through analysis using a series of predetermined and operationalised items. Here the aim is generalisations that are

(relatively) above time and context. For example, in medical research, people are classified and analysed in relation to numerical representations of norms (Aldridge 1996). A test that shows a child's normal development can therefore reveal deviations from the norm in the individual child.

In qualitative video analysis, which is highly influenced by ethnographic research, the aim is to reveal connections, patterns or phenomena not previously described, and often implicit for the people being observed. As the patterns found are always related to the specific historical and cultural frame in which they take place, here the interpretation is dependent on the context (Lincoln & Guba 1985).

In the following we will each present our own approach to Micro Video Analysis, and involve the workshop participants as well, in exploring different examples of how these analysis can be done.

Video Micro Analysis – from a qualitative approach

Ulla Holck

Introduction; the population and the aim of my research

In music therapy interventions for children with severe functional limitations, including children with severe autism, one of the primary goals is to develop the children's ability to participate in social interaction and communication. Quantitative research has proven music therapy to have a positive effect in helping children with severe communication difficulties to improve their capacity for social and pre-verbal skills such as response, initiative, turn taking, imitation and vocalisation (Müller & Warwick 1993; Bunt 1994; Edgerton 1994; Aldridge et al. 1995; Plahl 2000; Elephant 2002; Oldfield 2004).

While often the relative quantity of communicative behaviours increases, it can still be hard for the therapist to interpret and respond to them as such in an ongoing interaction. Analysis of interactions between adults and young disabled children (among others those with autism and Down's Syndrome) show that even the child's own parents can have problems in understanding responses because of their frequently weak, random, or ambivalent character (see Rogers 1988 for a review). At worst the problem is twofold; the child shows no sign of understanding the adult's initiative, and the adult cannot read the child's reactions as meaningful because they seem to occur without context.

Developing an isolated child's desire and ability to engage in communication requires creating an interaction form that both partners find meaningful and enjoyable (Klinger & Dawson 1992; Schuler et al. 1997). At moments when this succeeds, both partners seem to perceive and follow each other's actions, and a mutual and playful interaction can be created (Rogers 1988). In this way, meaningfulness refers to interactions where *both partners contribute to the continuation of the interaction* because it seems to be meaningful to do just that – even when we cannot know what precise meaning the interaction has for the child (see Holck 2002, 2004).

From this perspective, *one* reason for music therapy's capacity to engage these children could be the way it can facilitate the creation of *frameworks for meaningful interaction*. In a qualitative doctoral study involving video analyses of music therapy interventions with this population (Holck 2002), I explore some of the conditions through which this happens, combined with extended micro analyses

of patterns of interactions, showing mutuality, expectations, and other signs of meaningful interactions.

It is important to be aware that if the aim of the research is to prove music therapy's effect on the child, only clearly communicative expressions should be measured. However, if the aim is to analyse the interactive process *between* child and music therapist, one must consider whatever the participants themselves react to as communicative in the situation.

Qualitative Observation Research

Following this pragmatic approach to communication it makes sense to use Qualitative Observation Research, with reference to the ethnographic research tradition and Naturalistic Inquiry (Lincoln and Guba 1985). Generally, the main question in Qualitative Observation Research can be formulated as "What do people in this setting have to know (individually and collectively) in order to do what they are doing?" (H. Wolcott in Silverman 1993, p. 37). 'Knowledge' does here include implicit knowledge as well as purely procedural experience.

In answering this question, the aim of Qualitative Observation Research is to investigate the 'practices' of the persons being observed (Silverman 1993). 'Practices' are the (often implicit) ways in which persons do things together, habits, etc., that are built up gradually through many meetings over time. Therefore the object of Qualitative Observation Research is typically the repeated actions, themes or interaction patterns of every day situations. Pattern-generalisation is one of several qualitative ways of addressing the question of validity (Lincoln & Guba 1985; Silverman 1993), as repeated interactions between child and music therapist, for example, show that these actually are interactions and not arbitrary parallel incidents.

Let me give an example from music therapy: In the beginning of every session a child climbs up on the trampoline, after which he sits and waits for the music therapist to be ready at the piano and start playing. What does he have to have experienced in order to do this? First of all his actions show that he is familiar with the trampoline but also that he knows that his own actions and the therapist's actions are connected to each other somehow. Reversely, the music therapist's actions indicate that she knows what the boy expects and that she can be sure that he will wait for her – which is not a matter of course for these children!

Even though this example may seem commonplace, it shows a small 'practice', that has been built up from session to session and therefore contains a series of more or less implicit expectations between the partners. In this way, the practices are the 'local' context for interplay, because they make it possible for the partners to 'read' each other's expectations as pragmatically meaningful in the context.

Practices can be found at many levels in interplay. In my doctoral study I discovered a general practice form in music therapy with these children, which I have called the Interaction Theme (see Holck 2004 for an English presentation). Within each of the Interaction Themes one can find several 'practices' – some of them are obvious at first sight, others require micro analyses to be found and described explicitly.

Workshop; finding 'practices'

In the following I will invite you to try to discover some of these 'practices' within a specific Interaction Theme, that I'll present below.

But first a brief explanation of the data collection and method of analysis used in my research. My investigation included five music therapists' individual work with six children in all. In order to analyse the interactions between child and therapist, I recorded their interplay with two cameras and edited the recordings subsequently, so that both the child and the therapist appear in the same frame. Then I first transcribed the auditory material and then the visual. After that I analysed the material horizontally and vertically. In the horizontal analysis, the material is divided into a series of episodes, which then are analysed parallel to the temporal axis in the material. In the vertical analysis the interactions are compared across the material, for the purpose of finding interaction patterns – or 'practices'.

Video clip:

'Michael' is a 5 year old retarded boy with atypical autism, and a vocabulary of ten words only. The Interaction Theme between him and the therapist consists of the following; Michael jumps on the trampoline to the therapist's piano accompaniment, after which she makes an (expected) 'sudden' break in the music. He stops jumping, and after a few seconds, she plays a little calling motif on the deep dominant note. As he smiles, says "two" and starts jumping again, and the therapist ends the break by counting "one – two – three – now".

Within this Interaction Theme, there are several practices that vary a little each time. As for example, when the therapist doesn't start playing again after Michael's first "two", but looks at him teasingly. He smiles and repeats the word "two", sometimes accompanied by an as-if jump on the trampoline.

These common 'practices' makes it possible for the therapist to vary her expressions and challenge the boy's autistic need for sameness – in a way that he can manage within the structure, and that he enjoys!

Conclusion

Qualitative music therapy research is most often focused on constructed narratives told by informants being interviewed. In contrast, very little qualitative music therapy research is based on the observational approach described above. Aldridge (1996) has mentioned the ethnographic approach as useful for music therapists, but regarding music therapy research with clients without language, as far as I know no music therapists have used the approach described above. This is a shame, since I believe this research method to be very valuable in developing new concepts for describing music therapy interplay.

If the observed people can speak, Qualitative Observation Research can of course be combined with interviews after the process of analysis, for example as an expanded form of member check (Lincoln & Guba 1985). But the implicit character of many 'practices' makes it impossible to gather that kind of knowledge directly through interviews.

A famous example of combined observation (here both quantitative and qualitative methods) and interview comes from Stern, Hofer, Haft & Dore (1985), who investigated the *phenomenon* Affective Attunement. First they asked 10 mothers to play with their baby, while they were recorded on video. Afterwards Stern et al. viewed the recordings together with the mothers, and asked them to explain in their own words, what they were doing with their babies, and why.

This combination of video observation and interview is very useful in investigating new concepts. But interviews of the mothers right from the beginning would not have given much new knowledge, since Affective Attunement is pretty implicit as a phenomenon.

The same combination of observation (here purely qualitative) and interview (member check) was used when I found the general ‘practices’, which I have called Interaction Themes. The five music therapists included in the research would not have been able to point to this phenomenon, if I had asked them right away, but when they saw the different Interaction Themes presented together, they could give me a lot of feed back and comments to clarify my definition and delimitation of the phenomenon (Holck 2002, 2004).

The video analysis of 222 half-hour music therapy sessions - what did I learn?

Amelia Oldfield

The investigation, general overview

The general aim of this study was to find out more about my music therapy work with young children on the autistic spectrum and their parents. I wanted to confirm that my particular music therapy approach in this clinical area was effective and also to define this approach more specifically. This investigation was one of two music therapy outcome studies described in my PhD thesis (Oldfield 2004 and Oldfield *et al*, submitted).

I studied ten pre-school children on the autistic spectrum and their parents who received weekly, individual music therapy sessions over a period of 18 to 26 weeks each. The sessions were video-taped and all the videos were analysed in detail. The parents were interviewed and asked to fill in questionnaires both pre- and post-treatment. In addition, I took routine clinical notes after every session as well as writing the usual music therapy reports. These notes and reports were also included in the investigation.

I gained a great deal of important information from these notes and reports as well as from the interviews and questionnaires with the parents. In this presentation, however, I will focus specifically on the information I gained from the video-analysis.

The video analysis

The research assistant, Emma Carter, videoed all the music therapy sessions. Once treatment with a particular child was over, she started to analyse the videotapes of that particular child. She analysed the videos in random order, so that her possible expectations of progress would not influence her results. She analysed a total of 222 videos, which took her around 200 hours.

The video analysis system she used was the one that had been developed for my two previous music therapy research projects. (Oldfield and Adams 1995; Oldfield, Bunce and Adams, 2003).

For each of the children, the treatment objectives were translated into observable behaviours that could be counted and timed. These codes were then marked down in a time grid where every square represented five seconds. Important behaviours by the parents as well as by myself were also coded in a separate row of five-second time grids.

As the treatment objectives varied for each parent and child, the codes used for each dyad were different. Before starting analyses on a ‘new’ child the music therapy research assistant would meet

with me to determine exactly what she should be looking out for and work out which codes she should use. Some codes, particularly those relating to the music therapist, were similar across all the children, others were only used for some of the children depending on what the specific aims for each child were.

I was aware that with only one camera some aims such as 'increasing eye contact' would not be possible to measure in a reliable way. Similarly, it was not always possible to gauge the child's eye direction towards myself or the parent as we all moved around and all three people were not always in the picture. However, I felt that there were enough behaviours that we could measure to be able to get some idea of how the child and the parent were progressing in the sessions.

To help her to keep track of time as she watched the video, the research assistant used an electronic metronome set at five beats to the bar, where a beat occurred every second. On every fifth beat a bell would sound indicating that she needed to move on to the next grid. The use of the metronome to help with video-analysis was developed by Bunce in my previous music therapy project with mothers and young children and had previously been a reliable and accurate way to gather data, (Oldfield, *et al*, 2003). The video analysis started at the same time for every child, on the 'lo' part of the first 'hello' in the music therapist's greeting song.

After the research assistant had analysed around fifteen videotapes the research consultant, Malcolm Adams, checked three different videotapes chosen at random to confirm agreement on the consistent use of the codes. After all the videotapes had been analysed he randomly analysed two videotapes and found that he agreed with her results, indicating that her analyses had been reliable. Because of the experience gained using these methods in two previous investigations (Oldfield and Adams 1995, and Oldfield *et al* 2003) and also because of lack of time, it was not felt necessary to check inter-observer reliability in a more formal way.

The video analysis system developed by Plahl (2000) which she has called 'Kamuthe', has some similarities with the system I use here. However, her very detailed coding system is the same for all the children she analyses and is not tailored to the individual aims of the children. In her research project, she only analyses the first and the last five minutes of every thirty minute session. It is interesting to note that even though Plahl was able to use a computer programme to help with the video analyses, she still found that each minute she analysed took thirty minutes to complete. Although the music therapy research assistant did have to take additional time at the start of each new child to practise using the new codes, she then found that she could analyse each half-hour tape in one to one and a half hours.

Burford (1988) used video analyses to look at repetitive movements of children with profound learning disabilities and their carers. Recordings were made via a two camera system. The videos were analysed using an electronic time counter inserted on the screen to record real time to 1/100 second and frame by frame analysis. Unfortunately, this system would not have been viable for our analyses as we were trying to observe many different behaviours both for individual children and across the ten different experimental subjects. It was also unnecessary for us to time the behaviours we were analysing as accurately as in Burford's study.

Interpreting the video analysis data

Once the music therapy research assistant had analysed all the videotapes, she and I counted all the codes for the children and the parents. This counting was very time consuming and took around half

an hour per video. This meant that a total of around 110 hours was spent counting codes. These figures were then converted to percentages of total time codes recorded in each session in order to take account of the fact that each session varied in length. The percentages were subjected to statistical analysis.

In addition to counting up total numbers of each of the codes, I also counted up the length of some of the children's playing bouts in order to find out whether the amount of time children could focus on any one activity increased or decreased. I looked at the mean length of the playing bouts and the longest playing bouts for each of the sessions.

For the children and the parents I focused on how each of the behaviours we counted changed over time, because one of my hypotheses had been that I would be able to see such changes. When looking at the data on my behaviour in the sessions, I looked at mean percentages in order to get an idea of how I distributed my time and how this varied across the ten children.

Results from the video analysis

- Nine out of the ten dyads achieved some or all of individual aims set out before treatment began.
- Music therapy seemed to be particularly effective at increasing the children's levels of engagement. With a number of children, as the levels of engagement increased, the amount of playing and music making decreased.
- Music therapy was also good at increasing some of the children's use of words and reducing echolalic speech or vocalisations.
- For the three children who had difficulties managing their behaviour, music therapy did not reduce the children's amount of negative behaviours. However, these three children all had a honeymoon period at the beginning of treatment when they showed very few or no negative behaviours.
- A study of the way I spent my time in music therapy sessions revealed that I was generally very active. The amount of time I was 'not playing or attempting to engage' was small (average of 12%) and was similar for most of the children.
- I spent a high proportion of my time vocalising.
- I played the clarinet for similar amounts of time with each of the children. However, the amount of 'playful movement' varied more from child to child.

Conclusion

These were very positive and interesting results. When combined with the information from my music therapy notes and reports as well as the parents questionnaires and interviews, my findings confirmed that the work that I was doing was effective. I also gained some new insights into the work that I was doing and was therefore better able to describe and define my particular approach with this client group.

When I first set up this investigation, I had also hoped to be able to look in detail at how what I did as a music therapist in the session affected the child's responses. Unfortunately, because of the huge

amount of data we had to analyse I did not have time to do this. This meant that some aims such as ‘increasing turn taking’ or ‘encouraging imitation’ could not be evaluated specifically in this thesis. However, in the future, the clinical psychologist, Malcolm Adams, and I, hope to find some more funding to enter all the video analysis data (and not just total codes and length of bouts as we have done at present) into the computer. We would then aim to devise a special computer programme to analyse how each of the children’s individual actions correlated with my actions, or those of their parents.

Video Micro Analysis – quantitative and qualitative aspects

Christine Plahl

Background

Music is known to have a potential of establishing preverbal emotional and social communication and music therapy successfully uses this potential for establishing a musical contact and developing a musical dialogue.

Aims

To evaluate how and to what degree music is able to foster the development of preverbal social-emotional communication of multiple handicapped children – this means to evaluate both the effect of the music therapy treatment and to analyse the process of the music therapy treatment – I conducted a clinical intervention study in the Centre for Social Paediatrics in Munich, Germany. 12 multiple handicapped children, aged 2 to 6 years – with a developmental age from 8 to 32 months – received a two phase music therapy treatment comprising 10 sessions.

The focus of the analysis has been on the preverbal communication through joint attention, turn taking and intentional reference. Criteria for the outcome evaluation – which represent quantitative aspects – have been structural parameters of preverbal communicative abilities like frequencies and percentages of joint attention, turn taking and intentional reference. For the process evaluation of the music therapy sessions – representing the qualitative aspects – the interaction of child and music therapist has been analyzed for fostering communicative patterns – thus identifying those behavioural and musical aspects that create a zone of proximal development (Vygotsky, 1978).

Method

There has been a multi-method research design with a detailed micro analysis of music therapy video tapes by a computerized category system. Additionally the music therapists gave their estimation of experienced contact, emotional state and communicative activity on a rating scale completed after each music therapy session. The status of preverbal communicative development has been tested at the beginning and at the end of each treatment by the Early Social Communication Scales (ESCS) (Seibert & Hogan, 1982). In a semi-structured interview the parents reported the children’s communicative development at home.

All music therapy sessions have been videotaped and for the computerized microanalysis of music therapy sessions a category system has been developed. This category system is called KAMUTHE which means ‘Category System for Music Therapy’ and consists of four categories for the analysis of the child’s behavior and three categories for the analysis of the music therapist’s behavior (Plahl, 2000). The communicative behavior of the child is categorized into gaze, musical activity, vocalizations and gestures. The behavior of the music therapist is categorized into musical, verbal

and nonverbal communicative behavior. To achieve a differentiated behavior analysis the technique of real time event coding has been used. From each session the first and the last five minutes have been selected for both comparing the beginning and the end of each session and the course of the whole treatment.

Results

The results show significant improvements in the ability of preverbal social-emotional communication. This has been demonstrated for all kind of data and is especially impressive for the ability to regulate emotion and behaviour. Here all children developed more intentionality, more intensity and more self-confidence. The studied children improved their basic preverbal communicative competences: shared attention and behaviour regulation - the two dimensions of the ESCS. The figure shows the mean scores for the treatment group, that increase significantly on the 0.01 level in between one treatment phase and in the course of the whole treatment (Plahl & Voigt submitted).

The video micro analysis revealed that the observed frequencies in the communicative modalities of gestures, vocalizations, and activities with music instruments increase significantly at the 0.1 level comparing the beginning and the end of each session both for the first and for the second treatment phase.

The most important finding, however, is the growing percentage of intentional communication. Intentional communicative acts are defined as all communicative activities on musical instruments that are followed by a gaze to the music therapist - thus signalling communicative reference after a communicative contribution. The figure shows the clear decrease of non intentional communication combined with a simultaneous significant increase of intentional communication.

The results of the study show, that the examined children significantly improved their ability to express their needs and desires, to regulate their own emotions and the behaviour of their social partners in a more intentional and therefore more effective way and to gain by this way more self-confidence, independence, and more intense relationships to other persons. This not only helps to prevent secondary disorders caused by deficits in communicative competences but represents an improvement of living quality for the multiple handicapped children as well as for their parents and other relating persons.

Workshop

The interesting question now is how these results can be explained and how they are created in the course of the music therapy treatment.

The details of the video micro analysis reveal how the music therapist creates the fostering musical environment. This special feature of interaction is called zone of proximal development by Vygotsky (1978) and is characterised by a specific set of musical activities and a special form of therapeutic co-regulation that enables the child to perform activities that would not be possible without this specific structuring and enabling frame of musical interaction.

Example 1: The figure shows the result of the interaction analysis of a dance where the music therapist is creating a specific frame of coherence: She is accompanying her own dancing with a song, she is praising the child after each dance session, and she is asking her before the next session if she wants a repetition. The child, a four year old girl with Cornelia-de-Lange-Syndrome, who is

not able to use language for communication, obviously is expecting the question and is signalling her wish for repetition by a gesture that is referring to the music therapist.

These interactions are characterized through a coherent pattern of child and therapist communications, which means they provide a situation that is structuring an enabling frame for the social and emotional regulation of the child.

Example 2: In the following figure three patterns of synchronizing can be revealed: First the music therapist is accompanying the child's play on the guitar by a song. Then the music therapist is playing herself the guitar and the child is gesturing her wish to have the guitar again. Finally the gaze of the child to the therapist is responded by the confirming gesture of nodding her head.

It is this responding structure of the music therapist's behaviour – in rhythmically accompanying and answering the child – that not only creates a fostering frame but also reinforces the child through synchronized resonance.

Example 3: A still more detailed analysis of reciprocities reveals the elements of a musical dialogue. This figure shows the interaction pattern of a sequence from the ninth session with a five year old autistic boy. The communication pattern of this sequence clearly demonstrates a dialogical structure. The boy is signalling his communicative reference by directing his gaze to the hands of the music therapist after finishing his contribution.

This musical dialogue is characterized by reciprocal turn taking, that is very well tuned and by musical contributions, that are shaped both by the own preceding contribution and the contribution of the partner.

Conclusions

The analyzed interaction patterns of different music therapy sequences are characterized by an impressive pattern of coherence, symmetry and reciprocity. Rhythmic changes in the communicative behaviour of the music therapist facilitate joint attention and reciprocal reference. Synchronicity created by several musical and behavioural means allows for resonating actions and affections of the child. Finally reciprocity in the communication of music therapist and child enables a mutual exchange of turn taking – the ground for behavioural and social regulation.

Music can be understood as a transforming co-constructed process between two or more persons or as a transforming constructed process in one person. To support this transforming effect and to succeed in fostering the social emotional communication of multiple handicapped children the music therapy context has to be characterized by 'good' coordinated interactions (Tronick, 1989).

This kind of musical context enables the child to move frequently from affectively positive, mutually coordinated states to affectively negative not coordinated states and back again and is thus providing a central condition for therapeutic change. A specific mixture of repetition and variance in musical patterns combined with elements of recognition and surprise in the musical dialogue motivates the child for emotional expression and social behaviour regulation.

The combination of both quantitative and qualitative aspects of video micro analysis in music therapy research demonstrates that music therapy is successful in fostering preverbal development and can provide more insight in the process of how development is fostered through music.

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Christine Plahl: Video Micro Analysis – quantitative and qualitative aspects
Category system called KAMUTHE ‘Category System for Music Therapy’ (Plahl, 2000).

Categories of the music therapist

Musical behavior	Verbal behavior	Nonverbal behavior
MUS1 Vocalizing	VER1 Verbal comment	NON1 Gesturing
MUS2 Playing on instruments	VER2 Praising the child	NON2 Offering an instrument
MUS3 Singing a song	VER3 Asking the child	NON3 Moving an instrument
MUS4 Singing a song and accompanying on instrument	VER4 Inviting the child	NON4 Moving the child

Categories of the child

Gaze	Play/Musical activity	Vocalizations	Gestures
BLI1 Gaze to instrument	SPI1 Moving on instrument	VOK1 Vocalizing	GES1 Conventional gesture
BLI2 Gaze to therapist’s face	SPI2 Creating sound with an instrument	VOK2 Singing	GES2 Unconventional gesture
BLI3 Gaze to an object	SPI3 Playing with objects	VOK3 Talking	
BLI4 Gaze to therapist	SPI4 Moving with the instrument	VOK4 Laughing	
BLI5 Gaze to mother/father	SPI5 Moving rhythmically	VOK5 Moaning	
BLI6 Gaze to the room	SPI6 Moved by therapist	VOK6 Crying	

Plahl, C. (2000). *Entwicklung fördern durch Musik. Evaluation Musiktherapeutischer Behandlung*. [Development through Music. Assessment of Music Therapy Treatment.] PhD thesis from 1999, publ. in Münster: Waxmann.

Finland - abstract

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Video Micro Analysis in Music Therapy Research, a Research Workshop.

Three music therapy researchers from three different countries who have recently completed their PhD theses will each briefly discuss the role of video analysis in their investigations. All three of these research projects have involved music therapy work with children, some of whom were on the autistic spectrum.

Brief video clips will be shown and workshop participants will be invited to use different micro analysis approaches to record information from the video recordings. Through this process the participants will explore some of the advantages and disadvantages of quantitative and qualitative approaches to data collection. In addition, participants will be encouraged to reflect on what types of knowledge can be gained from video analyses and to explore the general relevance of video analysis in music therapy research.

Max 40 workshop participants

Equipment required: VHS-Video (with good picture and sound quality), overhead