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ORIGINAL ARTICLE

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Body Movement Music Score – Introduction of a newly developed model for the analysis and description of body qualities, movement and music in music therapy

BACKGROUND

In music therapy, there is a range of music therapy concepts that, in addition to music, describe and analyse the body and movement. A model that equally examines the body, movement and music has not been developed.

The Body Movement Music Score (BMMS) is a newly developed and evaluated music therapy model for analysing body qualities, movement, playing style of musical instruments and music and to describe body behaviour and body expression, movement behaviour and movement expression, playing behaviour and musical expression in music therapy treatment. The basis for the development of the Body Movement Music Score was the evaluation of the analytical movement model Emotorics-Emotive Body Movement Mind Paradigm (Emotorics-EBMMP) by Yona Shahar Levy for the analysis and description of the emotive-motor behaviour and movement expression of schizophrenic patients in music therapy treatment.

PARTICIPANTS AND PROCEDURE

The application of the Body Movement Music Score is presented in a videotaped example from the music therapy treatment of one schizophrenic patient.

RESULTS

The results of applying the Body Movement Music Score are presented in the form of Body Qualities I Analysis, Body Qualities II Analysis, Movement Analysis, Playing Style Analysis and Music Analysis Profiles.

CONCLUSIONS

The Body Movement Music Score has been developed and evaluated for the music therapy treatment of schizophrenic patients. For the development of the model, a proof of reliability is necessary to verify the reliability and limitations of the model in practice and show that the Body Movement Music Score could be used for both practical and clinical work, for documentation purposes and to impact research in music therapy.

KEY WORDS

Body Movement Music Score; Emotorics-Emotive Body Movement Mind Paradigm; music therapy with schizophrenic patients; body qualities analysis; movement analysis; playing style of musical instruments analysis; music analysis

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BACKGROUND

In music therapy, there are a variety of music therapy concepts and methodologies following the developmental psychology, depth psychology, analytical, integrative behavioural therapy-learning theory, systemic, anthroposophic and holistic-humanistic approaches equally (Decker-Voigt, 2001; Wigram, Pedersen, & Bonde, 2002; Decker-Voigt & Weymann, 2009; Wheeler & Murphy, 2016). All these approaches consider the body and its movement in a specific practical context for each of these concepts.

The historical roots of music therapy, especially in relation to the body, lie in the reform movements of the late 19th and early 20th centuries (Timmermann, 1994; Fitzthum, 2003, 2008; Skrzypek, Schmidt, & Timmermann, 2016).

Music therapy approaches that involve the body and its movement – in addition to the specific use of music – in practical music therapy work draw equally from music education and physical therapies and body psychotherapeutic methods. The theoretical foundations with respect to the body and movement in music therapy are based on the theories of Gestalt therapy, integrative therapy, on philosophical considerations and the results of infant research (Skrzypek et al., 2016). Accordingly, music therapy approaches, scales and assessment instruments that consider the body and/or movement in music therapy treatment are diverse. The following scales and approaches have been developed:

1. "Rating Scales for Improvisational Individual Music Therapy" by Paul Nordorff and Clive Robbins. In the Rating Scales of Nordorff and Robbins, musical communication, including three different types of activities (instrumental, vocal and physical activity), are investigated and judged. The scales are designed for music therapy in children with multiple disabilities and autism. Physical activity estimates movement during dancing and instrumental play in the context of communication in the entire musical activity between the child and the therapist (Nordorff & Robbins, 1980).
2. "Improvisation Assessment Profiles" from Kenneth Bruscia integrate scales that assess changes in the use of body parts, body posture, body tension, body language, movement patterns, facial expressions and breathing during musical improvisation. Bruscia first focused the model on mentally handicapped patients. The model was subsequently extended to other populations (Bruscia, 1987).
3. "Beobachtungsskalen des Lübecker Musiktherapiemodells" ("Observation Scales of the Lübeck Music Therapy Model") by von Thomas Maler, Jörn von Wietersheim; Eike Schurbohm; Andreas Nagel, Hubert Feiereis, Günter Jantschek describe changes in musical expression and behaviour in music therapy with psychosomatic and psychiatric patients. The "Energy" scale assesses the tension force of the body and the "Body" scale assesses the resonation of the body in instrumental play (Maler et al., 1994).
4. "Analysis of Notated Music Examples Selected from Improvisations of Psychotic Patients" from Jos De Backer und Tony Wigram observed, in addition to the choice of instruments, the musical parameters, the musical intervention and interaction, the tension in the body posture and facial expression in the music therapy treatment of psychotic patients (De Backer & Wigram, 2007).
5. An "Ethnographic Descriptive Approach to Video Microanalysis" by Ulla Holck is an approach to the observation of social interaction and communication between children with developmental disorders (including autism) and includes the observation of physical movement, gesture and facial expression (Holck, 2007).
6. "Microanalysis of Preverbal Communication in Music Therapy" by Christine Plahl analyses preverbal communication in children aged between 2 and 5 with various developmental disorders and incorporates the categories "Gestures and Movement" into the analysis (Plahl, 2007).
7. "Microanalysis of Interaction in Music Therapy" (MIMT) by Julia Scholtz, Melanie Voigt and Thomas Wosch is a system of categories for behavioural observation of the interaction between children with developmental disorders and disabilities and music therapists. The system includes – in addition to the observation categories "Gaze" and "Vocal Activity" – the category "Gestures and Movement Activity" (Scholtz, Voigt, & Wosch, 2007).
8. A "Phenomenologically Inspired Approach to Microanalysis of Improvisation in Music Therapy" by Gro Trondalen is a phenomenological analysis of improvisation. Trondalen considers body awareness and body expression during movement as an important aspect in music therapy treatment (Trondalen, 2007).
9. "MUSAD – Musikbasierte Autismusdiagnostik" (Music-based autism diagnosis) by Thomas Bergmann, Tanja Sappok, Albert Diefenbacher and Isabel Dziobek is a diagnostic procedure for adults with mental retardation and suspected autism which observes, inter alia, the form of body contact while dancing and the look and eye contact between the patient and music therapist (Bergmann, Sappok, Diefenbacher, & Dziobek, 2012),
10. Das "EBQ-Instrument" ("ARQ-Instrument", Assessment of the Quality of Relationship) by Karin Schumacher and Claudine Calvet provides an observation assessment of the relationship quality between autistic children and music therapists. The ARQ-Instrument includes four scales. One of the scales, the PEQR scale (physical and emotion-

al relationship quality), mainly observes the development of body experience, physical contact, the emotion expressed in facial expressions and body language and behaviour as well as the gaze and eye contact (Schumacher & Calvet, 2007).

Although all of these music therapy instruments, scales, techniques and methods, in addition to the music, in different contexts and objectives as well as in different populations with bodily characteristics such as bodily contact, body language, use of body parts, body attitude, body tension, body-self, body feeling, physical strength, body awareness, body experience, breath, facial expressions and gestures, gaze and eye contact and/or movement characteristics such as movement patterns, dance and movement while playing instruments are useful, there is a lack of specific analysis and description of processes that subsume all or as many of these physical and motion characteristics as possible.

For the author this fact was an opportunity to develop a new model, the Body Movement Music Score (BMMS). The BMMS originated from a 12-year practical, clinical, music therapy practice with adult psychiatric – in particular those suffering from schizophrenia and depression – patients who were not able to be communicate and express themselves musically and/or verbally.

The BMMS is based on the following theoretical sources:

- Music pedagogy and music education: Èmile Jaques-Dalcroze (1994), Elfriede Feudel (1926/1996), Mimi Scheiblauer (1973; Brunner-Danuser, 1984), Carl Orff (1976), Gunild Keetman (1981), Wilhelm Keller (1975) and Lilli Friedemann (1973),
- Body therapy and body psychotherapy: "Eutonie" by Gerda Alexander (1981), "Sensory Awareness" by Charlotte Selver (Brooks & Selver, 1997), "Feldenkrais Method" by Moshé Feldenkrais (1994a, 1994b, 1996), "Bioenergetic Analysis" by Alexander Lowen (1977, 1989, 1992, 2007), Integrative Dance Therapy, Integrative Movement and Body Therapy, by Hilarion Petzold, Ilse Orth, Johanna Sieper (Petzold, 1974, 1977, 1985, 1988, 1994, 2003, 2009; Petzold & Berger, 1977, 1994; Petzold & Orth, 1990; Petzold & Sieper, 2012), Dance Therapy by Trudi Schoop (1958, 1981), "Rolfing" by Ida Rolf (1989), "Ideokinese" by Mabel E. Todd (2003) and Body Therapy by Ken Dychtwald (1982),
- Movement analysis: Rudolf von Laban (1966, 1988, 2001), Judith Kestenberg Amighi (Kestenberg Amighi, Loman, Lewis, & Sossin, 1999), Yona Shahar-Levy (2001a, 2001b, 2004, 2009, 2012), Susanne Bender (Koch & Bender, 2007; Bender, 2014) and Petra Kugel (2000, 2008),
- Musicology: Zofia Lissa (1953; Chomiński & Lissa, 1957; Lissa & Lindstedt, 2007), Franciszek Wesołowski (2004) und Curt Sachs (1971, 1972; Sachs & Olędzki, 2005),
- Music therapy: Gertrud Orff (1974, 1976, 1984), Gertrud Katja Loos (1994, 1996a, 1996b; Zimmer, 2006), Tonius Timmermann (Engert-Timmermann & Timmermann, 2001; Timmermann, 1994, 2001, 2004), Fritz Hegi (1996, 1997, 1998; Hegi & Rüdisüli-Voerkel, 2011) Isabelle Frohne-Hagemann (1996, 1999, 2001a, 2001b); Monika Nöcker-Ribaupierre (1995, 2003, 2009), Karin Schumacher (1995, 2000a, 2000b, 2000c; Schumacher & Calvet, 2007, 2008; Schumacher, Calvet, & Reimer, 2011), Udo Baer (2012) and Gabriele Frick-Baer (Baer & Frick-Baer, 2001, 2004).

As a basis for the development of the BMMS, the movement analytical model – Emotorics-Emotive Body Movement Mind Paradigm – for music therapy with schizophrenic patients was evaluated. The Emotorics-Emotive Body Movement Mind Paradigm (Emotorics-EBMMP) was developed by Yona Shahar Levy, an Israeli movement/dance therapist and movement analyst (Shahar-Levy, 2001a, 2001b, 2004, 2009).

Emotorics-EBMMP is "a paradigmatic, psycho-diagnostic and movement analytical model for the observation, description and interpretation of emotive-motor behaviour" (Shahar-Levy, 2009, p. 268).

The basic aim of the development of BMMS was to create an instrument with an appropriate vocabulary for describing bodily behaviour and bodily expression, movement behaviour and the expression of movement, along with playing behaviour and the musical expression of the patient, without interpreting it, based on a phenomenological perspective, as Max van Manen defines it:

> "Phenomenology differs from almost every other social and human science in that it attempts to gain insightful descriptions of the way we experience the world prereflectively, largely without taxonomizing, classifying, codifying, or abstracting it. So phenomenology does not offer us the possibility of effective theory with which we can now explain and/or control the world; rather, it offers us the possibility of plausible insights that bring us in more contact with the world." (van Manen, 2014, p. 66)

BMMS was developed and evaluated in the context of my dissertation within the Philosophy and Social Sciences Faculty at the University of Augsburg in Augsburg/Germany.

PARTICIPANTS AND PROCEDURE

The application of BMMS is presented in the example of a videotaped scene from the music therapy treatment of a schizophrenic patient – Mr C.[1]. After a stay in hospital. Mr. C. was prescribed outpatient music therapy with the diagnosis according to ICD-10 F20.0 ("paranoid schizophrenic disorder") (Dilling, 2011, p. 131f.) in November 2004.

Within 13 months, he participated in a total of 33 individual music therapy sessions as an outpatient. The treatment took place in the Department of Mental Health at Braunau am Inn Hospital (Austria) between 24th November 2004 and 22nd December 2005.

Mr. C. is an Austrian citizen and at the time of being prescribed outpatient music therapy he was 40 years old. The following pharmacological agents were administered to him: Olanzapin 10 mg, Sertralin 50 mg and Prothipendyl 40 mg.

The patient comes from a family that runs a farm. He lives with his mother and sister, who also suffer from a paranoid schizophrenic disorder, and her young son and his brother's family on the farm. The first symptoms of paranoid schizophrenic disorder occurred in his 20s.

Before his clinical stay in our hospital, Mr C. suffered from paranoid ideas, refused food and fluid intake, caused a car accident and withdrew entirely from social life. He was anxious, withdrawn, closed off and idle for several months. He lay in bed and did not speak with his family members.

In the first music therapy sessions, he gave me no answers to my questions. Later on in the music therapy treatment he formed neologisms, which made verbal communication between us difficult and incomprehensible. His contact ability was significantly limited, he was slowed down, in a depressed mood, absent, withdrawn, pensive, anxious and shy. His emotions seemed non-existent. In his facial expressions he reacted sceptically or with grimaces and mannerisms, he wrinkled his nose and frowned. He made small gestural expressions, and when he wanted he brought the music to a halt with a gesture. He was significantly reduced in drive and suffered from catatonic symptoms and attitude stereotypes. During the second music therapy session, he played a vibraphone for 20 minutes and his body was frozen and he was striking in psychomotor terms, he was standing on one leg and balancing while playing the xylophone. His body seemed fragmented and not to be coherent, his head fell forward as if it were separated from his neck, he pushed his jaw forward. His musical expression was almost absent.

With time, he was able to concentrate better, was emotionally balanced, accessible and better in contact. After we finished the individual music therapy on 22nd December 2005, he moved to the outpatient music therapy group and participated in a group with five other chronic schizophrenic patients.

Eight of the 33 individual music therapy sessions were videotaped. From these eight videotaped music therapy sessions, three video sequences were selected in the course of the rating process. The selection of video sequences took place in 2012, seven years after the termination of music therapy treatment and one year before the beginning of the evaluation. The rating process involved a total of four raters: three certified music therapists from Germany and a movement analyst from Israel.

The raters had the role, independent of the music therapist, to look at all the films and select relevant video sequences for evaluation. The rating process should ensure objectivity in the selection of scenes.

Each of the four raters received videoed music therapy sessions (films) and a list of characteristics with the following items:

Body Movement Music Score

a) Symptoms,
b) Intrapersonal relationship,
c) Interpersonal relationship,
d) Synchronous moments.

For the symptoms: By symptoms we mean the physical symptoms of schizophrenia: fixation or solidification in the body and its intensity, visible incoherence in physical and movement behaviour (e.g. fragmentation of the body) (Scharfetter, 1995; Röhricht & Priebe, 1998),

For the intrapersonal relationship: The patient starts to have contact with and explore his body (Schumacher et al., 2011),

For the interpersonal relationship: Visible (in physical behaviour) and audible (musical, vocal and instrumental) dialogues, also offers of dialogue and attempts (e.g. question-answer games, picking up, reproducing or amplifying musical and/or physical movements) (Schumacher et al., 2011),

For synchronous moments: This refers to moments of coincidence in time also in the sense of "joint attention", common and prolonged concentration of attention on a common activity – instrumental play, singing, moving or dancing (Schumacher et al., 2011).

From the eight films, the raters selected a total of twenty video sequences corresponding to the characteristics. As part of the doctoral colloquium at the University of Augsburg, the results of the rating process were reviewed in detail, discussed and the selection of video sequences limited to three sequences.

In the evaluation procedures, the following video sequences were analysed:

- Video sequence 1 from film no. 1 of 25th November 2004,
- Video sequence 2 from film no. 3 of 31st March 2005,
- Video sequence 3 from film no. 7 of 8th September 2005.

These three selected video sequences were evaluated by 33 observers (seven certified music therapists, 23 music therapy students, three motion analysts) using evaluation forms. The statistical results of the evaluation were presented, described and discussed in my dissertation.

In this article, video sequence 3 is analysed to illustrate the application of the BMMS. This video sequence lasts 2 minutes and 56 seconds.

METHODS

BMMS

The BMMS is a newly developed and evaluated music therapy model for analysing body qualities, movement, playing styles of musical instruments and music and to describe body behaviour and body expression, movement behaviour and movement expression, playing behaviour and musical expression in music therapy treatment.

The BMMS consists of four parts: the Body Part, Movement Part, Playing Styles of Musical Instruments Part and Music Part. Each part consists of two parts: a theoretical and a practical part. The theoretical parts include theoretical foundations, concepts and definitions. The practical parts include the body qualities analysis, movement analysis, playing styles analysis and music analysis profiles of the patient and his bodily, movement and musical expression using a notation system (Figure 1 presents an organigram of BMMS).

In the first part of the BMMS, the Body Part, body qualities I and II are analysed.

Body qualities I include the personal and bodily characteristics of a patient, it being understood that the body structure, body posture, body plane, body axis and the use of the kinesphere can be observed in the use of body parts. Table 1 shows an overview of Body Qualities I Analysis.

The analysis of body qualities allows the music therapist to describe the bodily behaviour and bodily expression of the patient.

Body qualities II define the body splitting, the bipolar and unipolar shape flow, the spatial references, bodily proximity and distance, the bodily contact and the function of touching (Table 2).

The second part of the BMMS, the Movement Part, concerns movement analysis with the Emotorics-Emotive Body Movement Mind Paradigm. Emotorics-EBMMP analyses and describes the emotive-motor behaviour, including any movement factors, psychomotor markers and their binary potentials, as can be seen from Table 3.

Movement analysis allows the music therapist to describe the movement behaviour and movement expression of patients.

In the third part of BMMS – the Musical Instruments and Playing Style Part – musical instruments are classified and characterised by their specific playing methods in music therapy. In the Playing Style Part, types of body instruments, sound gestures and musical gestures are also described. Table 4 illustrates the Playing Style Analysis.

The results of the observation and analysis of playing styles form the basis for creating Playing Styles Profiles and allow the music therapist to describe which musical instruments the patient selects and what physical movement he uses while playing them.

The Musical Instruments and Playing Style Part forms a transition between the Body and Movement Parts and the Music Part. The body qualities and the movement correlate with the playing styles and with the kinds of musical instruments and are audible in the music.

In the Music Part, the fourth part of BMMS is based on the analysis of music and its specific elements – rhythm, measure, time signature, melody, sound, harmony, tempo, agogics, articulation, phrasing, form, dynamics and tonality – and their poten-

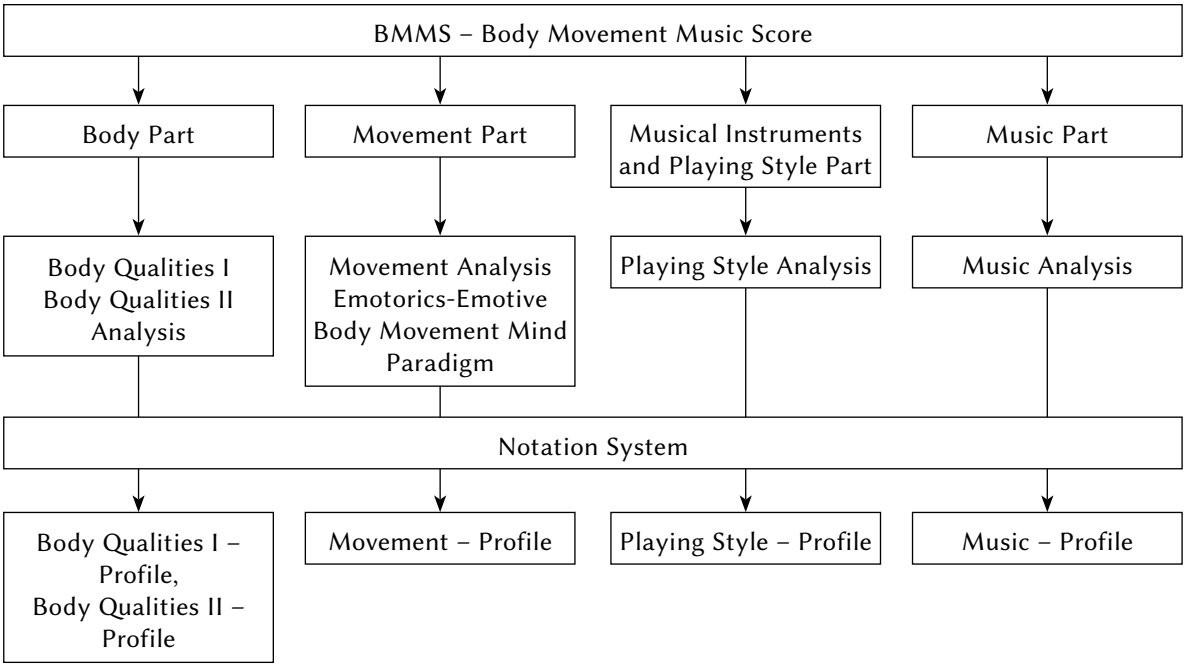


Figure 1. Body Movement Music Score – Organigram.

Table 1

Body Part. Body Qualities I Analysis

I. Body-Part										
I.1 Body qualities I – Matrix										
			I.1.1a Right side of the body			I.1.1b Body center			I.1.1c Left side of the body		
I.1.1	Body parts	1	shoulder/shoulder joint			1	head	1	shoulder/shoulder joint		
		2	upper arm			2	neck	2	upper arm		
		3	elbow joint/elbow					3	elbow joint/elbow		
		4	lower arm			3	trunk	4	lower arm		
		5	wrist/hand	6	finger/fingers			5	wrist/hand	6	finger/fingers
		7	hip joint/thigh			4	pelvis	7	hip joint/thigh		
		8	knee/knee joint					8	knee/knee joint		
		9	lower leg					9	lower leg		
		10	ankle joint/foot	11	heel/toes			10	ankle joint/foot	11	heel/toes
I.1.2	Body posture	1	stand	2	sit	3	squat	4	kneel	5	lie
I.1.3	Body plane	1	horizontal			2	vertical			3	sagittal
I.1.4	Body axis	1	horizontal			2	vertical			3	sagittal
I.1.5	Kinesphere	1	near			2	middle			3	FAR

Table 2

Body Part. Body Qualities II Analysis

I. Body-Part								
I.2 Body qualities II – Binary Matrix								
Marker/Potentials			P0-Potentials	P0	TI	P1	P1-Potentials	
I.2.1	Musical/ Motor activity	0	playing music, singing	⊙		⊙	move, dance	0
I.2.2	Body splitting	1	left	⊙		⊙	right	1
		2	front	⊙		⊙	back	2
		3	up	⊙		⊙	down	3
		4	trunk	⊙		⊙	limbs	4
I.2.3	Bipolar shape flow	5	shrinking	⊙		⊙	growing	5
		6	narrowing	⊙		⊙	widening	6
		7	shortening	⊙		⊙	lenghtening	7
		8	hollowing	⊙		⊙	bulging	8
I.2.4	Unipolar shape flow	9	medial narrowing	⊙		⊙	lateral widening	9
		10	cephalad shortening	⊙		⊙	cephalad lengthtening	10
		11	caudal shortening	⊙		⊙	caudal lenghtening	11
		12	hollowing anterior	⊙		⊙	hollowing bulging	12
		13	hollowing posterior	⊙		⊙	bulging posterior	13
I.2.5	Spatial references	14	spatial allowing	⊙		⊙	spatial avoiding	14
I.2.6	Bodily proximity and distance	15	intimate distance	⊙		⊙	personal distance	15
		16	social distance	⊙		⊙	public distance	16
I.2.7	Bodily/Physically contact	17	avoid	⊙		⊙	refusal	17
		18	ambivalence	⊙		⊙	passiv acceptance	18
		19	urges, wishes, initiation	⊙		⊙	touching another person	19
		20	self-explorativ touching	⊙		⊙	aggressive, self-destructive self-touching	20
I.2.8	Function of touching	21	communicative, interactive touching	⊙		⊙	aggressive, possessive touching	21
		22	bodily/physically supportive touching	⊙		⊙	emotionally supportive touching	22

Note. P0 – P0 potentials, T – transition, I – interweaving, P1 – P1 potentials.

tials in music therapy treatment. Table 5 presents an overview of the Music Analysis.

The music analysis allows the music therapists to describe the musical/instrumental and vocal expression of the patient.

NOTATION SYSTEM

The graphic system for displaying the results of the analysis with the BMMS was taken from the movement analysis with Emotorics-EBMMP and revised for the BMMS (Shahar-Levy, 2001a, 2001b, 2004).

The entire graphic system of the BMMS is composed of:

- a Matrix for Body Qualities I Analysis,
- a Binary Matrix for Body Qualities II Analysis,
- a Binary Matrix for Musical Instruments and Playing Styles Analysis,
- a Binary Matrix for Music Analysis, and
- four circle diagrams.

Table 3

Movement Part. Movement Analysis

II. Movement-Part								
Emotorics-Emotive Body Movement Mind Paradigm								
Movement Analysis – Binary Matrix								
Psychomotoric marker		P0	P0-Potentials	P0	TI	P1	P1-Potentials	P0
motor activity	Movement modifiers	0	no visible movement	⊙		⊙	visible movement	0
muscle tone		1	muscle relaxation	⊙		⊙	muscle contraction	1
motor activity cycles	Energy Intensity Tension Force	2	motor flow	⊙		⊙	motor inhibition	2
use of body force		3	weightiness/ use of weight	⊙		⊙	forcefulness/use of force	3
intensity degree		4	low intensity	⊙		⊙	high intensity	4
body attitude to gravity		5	with the force of gravity	⊙		⊙	against the force of gravity	5
relation of body parts to body center		6	inward movement	⊙		⊙	outward movement	6
trunk-limbs activation		7	trunk activity	⊙		⊙	limbs activity	7
joint activity/shape		8	flexion	⊙		⊙	extension	8
archetypal body shapes		9	round-curved shapes	⊙		⊙	straight-linear shapes	9
relation of body parts to body axis		10	symmetrical	⊙		⊙	asymmetrical	10
emotive-motor discharge	Form Space	11	wavy, trembling, vibrating movements	⊙		⊙	ballistic, impulsive, progressive movements	11
motor flow		12	rotation, rotating movement in limbs	⊙		⊙	regulated movement progression	12
movement direction		13	bi-directional, side to side, back and forth	⊙		⊙	uni-directional	13
movement range		14	small range	⊙		⊙	wide range	14
spatial body position		15	horizontal position	⊙		⊙	vertical position	15
movement tempo	Tempo	16	quick movement	⊙		⊙	slow movement	16
movement articulation		17	fragmented, interrupted movement	⊙		⊙	continuos movement	17
movement regulation		18	transition	⊙		⊙	fixation	18
movement modulation		19	repetition	⊙		⊙	variation	19
movement differentiation	Regulation Modulation	20	non-differentiation	⊙		⊙	differentiation	20
movement intentionality		21	non-directional movement	⊙		⊙	direct movement	21
attention types		22	diffused/distracted attention	⊙		⊙	focused, concentrated attention	22

Note. P0 – P0 potentials, T - transition, I – interweaving, P1 – P1 potentials.

Table 4

Musical Instruments and Playing Style Part. Playing Style Analysis

III. Musical Instruments and Playing Style-Part								
Musical Instruments and Playing Style – Binary Matrix								
Marker/Potentials			P0-Potentials	P0	TI	P1	P1-Potentials	
III.1	Instrumental choice	0	body as instrument	⊙		⊙	musical instruments	0
III.2	Musical instruments	1	idiophones	⊙		⊙	membranophones	1
		2	string chordophones	⊙		⊙	plucked chordophones	2
		3	keyboard chordophones	⊙		⊙	aerophones	3
		4	electrophones	⊙		⊙	self-made musical instruments and sound objects	4
		5	body instruments	⊙		⊙	other objects	5
III.3	Playing style	6	knock/strike	⊙		⊙	blowing into	6
		7	strike	⊙		⊙	sing	7
		8	put on	⊙		⊙	blow	8
		9	mute	⊙		⊙	press	9
		10	to flutter tongue	⊙		⊙	glide	10
		11	grip	⊙		⊙	strum	11
		12	clink/clank	⊙		⊙	tap	12
		13	scratch	⊙		⊙	rattle	13
		14	clatter	⊙		⊙	to make a resping noise	14
		15	scrape	⊙		⊙	trickle/ripple	15
		16	stir	⊙		⊙	clang	16
		17	shake	⊙		⊙	stroke	17
		18	tip	⊙		⊙	swipe	18
		19	pull	⊙		⊙	pluck	19
		20	with the finger/fingers	⊙		⊙	with the hand/hands	20
		21	with the food/feet	⊙		⊙	with the bow	21
		22	with mallets	⊙		⊙	with the sticks/brush	22
III.4	Sound gestures	23	clapping	⊙		⊙	slapping	23
		24	stamping	⊙		⊙	snapping	24
		25	tongue clicking	⊙		⊙	tapping	25
		26	stroking	⊙		⊙	rubbing	26
III.5	Musical gestures	27	to direct time	⊙		⊙	to conduct	27

Note. P0 – P0 potentials, T – transition, I – interweaving, P1 – P1 potentials.

The matrix for Body Qualities I Analysis subsumed the potentials in the form of a table (Table 1). The representation of the binary matrix in the form of a circle diagram illustrates the overview of the relationships – transition (T) and interweaving (I) – between the P0 potentials (P0) and P1 potentials (P1).

In the analysis of body qualities and movement, P0 potentials are represented by circles with a centre point. These small circles form the inner circle of the circular diagram. The outer ring summarises the P1 potentials; these circles are larger. The numbers in the circle diagram correlate with the numbers in the binary matrix. The circle diagram makes it possible to

Table 5

Music-Part. Music-Analysis

IV. Music-Part								
Music Analysis – Binary Matrix								
Music analysis marker		P0	P0-Potentials	P0	TI	P1	P1-Potentials	P1
musical activity	Musical elements	0	inaudible music	⊙		⊙	audible music	0
rhythmic structure	Rhythm	1	arrhythmic/ pre-rhythmic	⊙		⊙	rhythmic pattern	1
		2	simple	⊙		⊙	polyrhythmic	2
		3	rest	⊙		⊙	syncopation	3
	Measure	4	ametric, irregular, changing	⊙		⊙	metric, steady, pulsating	4
	Time signature	5	simple time signatures	⊙		⊙	compound time signatures	5
melodic development	Melody	6	pre-melodic	⊙		⊙	melodic theme	6
melodic form I		7	motive	⊙		⊙	contrast motive	7
melodic form II		8	sequence/phrase	⊙		⊙	sentence/proposition	8
melodic motion I		9	skips/jumps/leaps	⊙		⊙	steps	9
melodic motion II		10	ascending movement/ question	⊙		⊙	descending movement/answer	10
range of melodic line		11	note repetition	⊙		⊙	ambitus/range	11
time characteristic		12	diminution	⊙		⊙	augmentation	12
quality of sound I	Sound	13	warm, resonant	⊙		⊙	cold, dry, rejecting/ dismissing	13
		14	sweet, lovely	⊙		⊙	saddened, bitter	14
		15	mild, tender, soft	⊙		⊙	shrill, sharp, rough	15
		16	passionate, fervent	⊙		⊙	trembling, vibrating	16
		17	imaginative	⊙		⊙	boring	17
quality of sound II		18	frivolous, flirtatious, with relish	⊙		⊙	empty, rigid, stiff	18
		19	steady, constant	⊙		⊙	random	19
		20	simple, modest, shy	⊙		⊙	accented/stressed, highlited	20
		21	uncertain, unsure	⊙		⊙	pompous, pathetic	21
quality of sound III		22	scared, shaky, supressed, reserved	⊙		⊙	impulsive, aggressive, explosive, combative	22
		23	vital, lively, voluminous	⊙		⊙	sad, weak	23
		24	bright, glowing, funny	⊙		⊙	dark, dull, grim	24
		25	light, easy, free	⊙		⊙	grave, depressed, melancholic	25

(Table 5 continues)

Table 5

(Table 5 continued)

IV. Music-Part								
Music Analysis – Binary Matrix								
Music analysis marker		P0	P0-Potentials	P0	TI	P1	P1-Potentials	P1
quality of sound IV	Sound	26	consoling, calming	⊙		⊙	resignated, lamenting, sorrowfull	26
quality of sound V		27	cheerful, hopeful	⊙		⊙	longing, nostalgic	27
kinds of intervals	Harmony	28	consonant intervals	⊙		⊙	dissonant intervals	28
type of voice-leading		29	homophony	⊙		⊙	polyphony	29
tempo marking I	Tempo	30	very slow, broadly	⊙		⊙	moderate	30
tempo marking II		31	very fast	⊙		⊙	quick, lively	31
transition between tempo	Agogics	32	become faster/accelerando	⊙		⊙	become slower/ritardando	32
kind of sound articulation I	Articulation	33	staccato	⊙		⊙	legato	33
kind of sound articulation II		34	portato	⊙		⊙	portamento or glissando/slide	34
phrase building	Phrasing	35	accentuated, emphasized, abrupt	⊙		⊙	held, carried, flowing	35
organisation of formal structure elements I		36	ostinato	⊙		⊙	kanon	36
organisation of formal structure elements II	Form	37	imitation	⊙		⊙	counterpoint	37
form building I		38	children's song/nursery rhymes	⊙		⊙	song	38
form building II		39	free improvisation	⊙		⊙	thematic-specific improvisation	39
low intensity		40	very soft/pianissimo	⊙		⊙	medium soft/mezzo piano	40
high intensity	Dynamics	41	very loud/fortissimo	⊙		⊙	medium loud/mezzo forte	41
transition between intensity levels		42	become louder/crescendo	⊙		⊙	become softer/decrescendo	42
scale I	Tonality	43	atonal/chromatic	⊙		⊙	tonality: major or minor	43
scale II		44	pentatonic scale	⊙		⊙	blues scale	44

Note. P0 – P0 potentials, T – transition, I – interweaving, P1 – P1 potentials.

analyse both the smallest details and the pattern as a whole. Graphically, it represents the convergence of P0 and P1 potentials.

The small dot in the circle means that the potential is temporarily inactive. If the right conditions are created for it, it can be reactivated.

The activity of the potential for Body Qualities II and Movement Analysis is marked by the symbol in question – in this case the circle diagram.

Next, the dominant potentials and the emerging dominance are analysed. Dominance may mean that the affected potential is striking through its intensity

or is marked by its complete absence. The dominance of the P0 potential is indicated by a red circle, with that of the P1 potential being indicated by a red rectangle.

Furthermore, the relationship and integration of the individual potentials are examined. The transitions and interweaving between the potentials can be flowing, blocked, fragmented or complementary.

The circle diagram that represents Body Qualities II and Movement Analysis is completed with the help of the following notation. Table 6 presents the notation signs of Body Qualities II and Movement Analysis.

For the Analysis of Musical Instruments and Playing Styles, as well as for Music Analysis, the notation character is adjusted. The circles, which are marked in Body Qualities II and in the Movement Analysis as P0 and P1 potentials in Playing Styles and Music Analysis are represented by note-shaped ovals. Table 7 shows the notation signs of Playing Style and Music Analysis.

The coloured lines between the potentials highlight clustering. The clusters indicate recurring patterns. The clusters are formed from the connections between the individual potentials.

RESULTS

The results of the BMMS analysis of the videotaped sequence of the music therapy treatment of a schizophrenic patient are presented in the form of profiles. A Body Qualities I, Body Qualities II, Movement, Playing Style and a vocal and instrumental Music Analysis Profile are created.

The creation of profiles with the BMMS is a systematic process: First, the active potential is highlighted in the respective matrix and the circular diagram. The second step is to determine which active potentials are dominant and in what way the dominance of the potential is presented: Are the potentials dominant because they stand out or because they seem utterly inactive? Thereafter it is observed which transition or

Table 6

Notation Signs. Body Qualities II and Movement Analysis

Notation Body Qualities II and Movement Analysis		
Function	Notation signs	Explanation
P0- and P1-potentials activity	⊙	inactive potential
	○	dominant P0-potential
	●	active potential
	□	dominant P1-potential
transition and interweaving between P0- and P1-potentials	Φ	blocked TI
	~	flowing TI
	ϟ	fragmentary TI
	∞	complemtentary TI
connectivity between P0- und P1-potentials		cluster-building

Table 7

Notation Signs. Playing Style and Music Analysis

Notation Playing Style and Music Analysis		
Function	Notation signs	Explanation
P0- and P1-potentials activity	⊙	inactive potential
	○	dominant P0-potential
	●	active potential
	□	dominant P1-potential
transition and interweaving between P0- and P1-potentials	Φ	blocked TI
	~	flowing TI
	ϟ	fragmentary TI
	∞	complemtentary TI
connectivity between P0- und P1-potentials		cluster-building

interweaving types and/or interconnectedness exist between the potentials: Are the transitions blocked, flowing, fragmented or complementary? Finally, the clustering is examined.

BODY CHARACTERISTICS I PROFILE

The results of the observation and the analysis of Body Qualities I are shown in the form of a matrix (Table 8). These results form the basis for the creation of the Body Qualities I Profile for the description of use of body parts, body posture, body planes, the body axis and the kinesphere.

To express themselves physically, the patient uses the fingers of both hands (I.1.1a_6 & I.1.1c_6), both wrists and hands (I.1.1a_5 & I.1.1c_5), both lower arms (I.1.1a_4 & I.1.1c_4), both elbows and elbow joints (I.1.1a_4 & I.1.1c_4), both upper arms (I.1.1a_2 & I.1.1c_2), both shoulder joints and shoulders (I.1.1.a_1 & I.1.1c_1), their head (I.1.1b_1), their neck (I.1.1b_2), the trunk (I.1.1b_3) and their pelvis (I .1.b_4).

The patient is seated (I.1.2_2) on a chair at the table opposite the music therapist and performs his movements in the horizontal body plane (I.1.3_1) along the vertical axis of the body (I.1.4_2). The body movement takes place in the middle (1.5_2) and partly in the far (1.5_3) kinesphere.

BODY QUALITIES II PROFILE

The starting point of the Body Qualities Analysis is the observation of whether motor activity takes place. The patient can move, dance, play musical instruments and/or sing.

The results of the observation and analysis of Body Qualities II form the basis for the creation of the Body Qualities II Profile to describe motor activity, the body splitting, the bipolar and unipolar shape flow, the spatial references, the bodily proximity and distance, the body contact and the function of touching (Figure 2).

The patient plays a musical instrument and sings (P0_0).

A body split exists between the up (P0_3) and down (P1_3).

In bipolar shape flow in the horizontal dimension, the patient tends to narrow (P0_5) and to widen (P0_6).

In unipolar shape flow, he is hollowing his body posterior in the sagittal dimension (P0_13). A backwards movement in this case is the typical response to a shock (too loud vocal utterance of the music therapist), which comes from the front.

He tends to allow the space (P0_14).

The distance between the patient and the music therapist has the dimension of personal space (P1_15). The need for bodily contact is visible (P0_19). The patient touches the music therapist with his palm (P1_19).

Both body qualities profiles summarise the bodily behaviour and the bodily expression of the patient together.

MOVEMENT ANALYSIS PROFILE

The movement analysis begins with the observation of whether there is visible movement or not.

The results of the observation of the Movement Analysis are the basis for the creation of the Movement Analysis Profile to describe the movement behaviour and movement expression of the patient (Figure 3).

The patient's movement is visible (P1_0).

The trunk is contracted with high intensity: Cluster 1 – P0_7 P1_4 & & P1_1.

There are flowing transitions between relaxation (P0_1) and contraction (P1_1) of the muscles, the motor flow (P0_2) and motor inhibition (P1_2) of motor impulses, between the movement that follows gravity (P0_5) and the movement which goes against gravity (P1_5), between inward movements (P0_6) and outward movements (P1_6) from the body axis of the torso and the extremities, between symmetrical (P0_10) and asymmetrical (P1_10) movements, between small (P0_14) and wide (P1_14) extensive movements, between quick (P0_16) and slow (P1_16) movements, between transitions (P0_18) and fixation (P1_18) and between repetition (P0_19) and variation in the movement (P1_19).

Rotating movements occurring in the extremities (limbs) (P0_12).

The transitions between flexion (P0_8) and extension (P1_8), between wavy, trembling, vibrating (P0_11) and ballistic, progressive (P1_11) movements and between bi-directional (P0_13) and uni-directional (P1_13) movements are fragmented.

The patient uses his own body weight (P0_3) and applies his own force (P1_3) to perform the movements with low (P0_4) and high intensity (P1_4). The body is in the vertical (P1_15) position.

The movement is differentiated (P1_20), directly and directed (P1_21). The attention is focused and concentrated on the musical instruments, on their own actions and the music therapist (P1_22).

PLAYING STYLE PROFILE

The playing analysis begins with the observation of whether the patient chooses a musical instrument or uses his body as an instrument.

The results of playing analyses are used to create the Playing Style Profile (Figure 4).

Table 8

Body Qualities I – Profile

I. Body-Part												
I.1 Body qualities I – Matrix												
		I.1.1a Right side of the body					I.1.1b Body center		I.1.1c Left side of the body			
I.1.1	Body parts	1	shoulder/shoulder joint				1	head	1	shoulder/shoulder joint		
		2	upper arm				2	neck	2	upper arm		
		3	elbow joint/elbow						3	elbow joint/elbow		
		4	lower arm				3	trunk	4	lower arm		
		5	wrist/hand	6	finger/fingers				5	wrist/hand	6	finger/fingers
		7	hip joint/thigh				4	pelvis	7	hip joint/thigh		
		8	knee/knee joint						8	knee/knee joint		
		9	lower leg						9	lower leg		
		10	ankle joint/foot	11	heel/toes				10	ankle joint/foot	11	heel/toes
I.1.2	Body posture	1	stand	2	sit		3	squat	4	kneel	5	lie
I.1.3	Body plane	1	horizontal				2	vertical			3	sagittal
I.1.4	Body axis	1	horizontal				2	vertical			3	sagittal
I.1.5	Kinesphere	1	near				2	middle			3	far

Note. The activity of the potentials is marked in red colour.

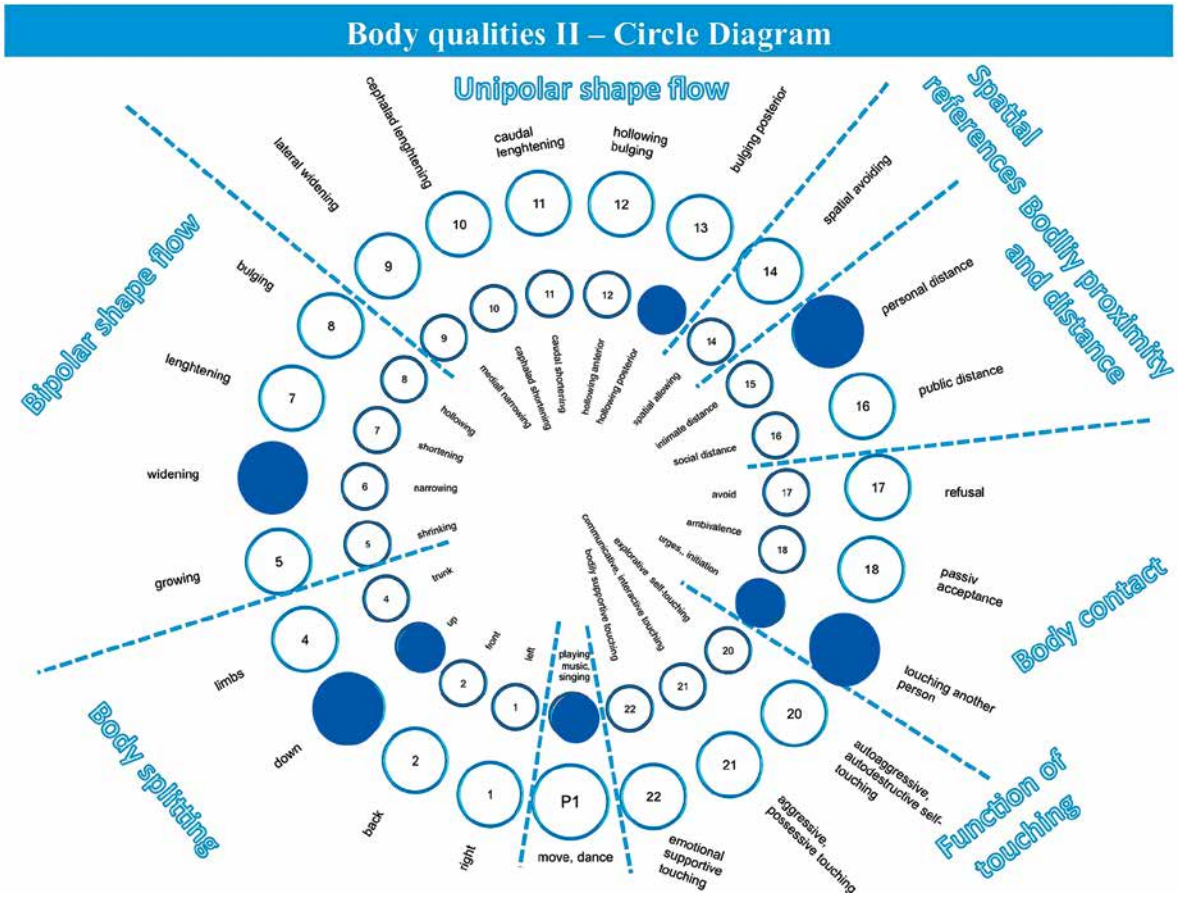


Figure 2. Body Qualities II – Profile.

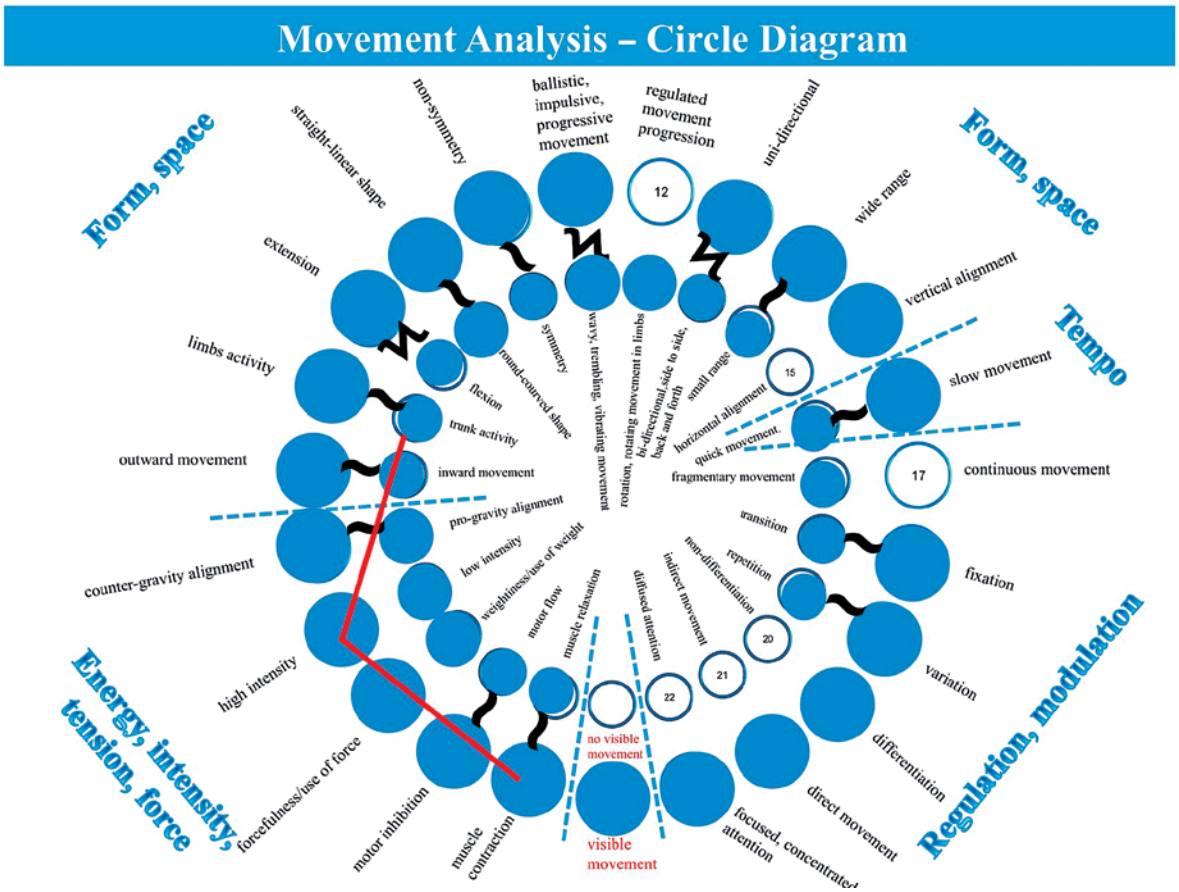


Figure 3. Movement Analysis – Profile.

The patient first selects a musical instrument (P1_0), the cabasa. But he does not want to play this. He gestures an instrument change to the therapist and plays the caxixi. The cabasa and caxixi belong to the idiophone group (P0_1).

The patient shakes (P0_17), rattles (P0_13) and bangs (P1_16) the caxixi with both hands (P1_20).

Finally, the patient changes instrument and briefly swaps (P0_17) the stirdrum. The stirdrum is another instrument from the idiophone group (P0_1).

INSTRUMENTAL MUSIC ANALYSIS PROFILE

The starting point for analysing the music begins with the observation of whether the music can be heard or not.

The music analysis contains two sections: the instrumental and the vocal music analysis profile. First, the instrumental Music Analysis Profile is presented (Figure 5).

The instrumental music is audible (P1_0). In instrumental play, the patient's rhythm oscillates between arhythmicity (P0_1) and the formation of rhythmic patterns (P1_1). The transition between them is fragmented. The rhythm is simple (P0_2). The line of rhythm is lengthy and dominated by tense pauses (dominant P0_3).

The measure is temporarily ametric, irregular and changing (P0_4), and at times the measure goes through free improvisation (P0_39) metric and pulsating (P1_4). The transitions between the measure potentials are fragmented.

The time signature is simple (P0_5).

The sound of the instrumental expression changes between scared and shaky (P0_22), combative and impulsive (P1_22), and lively and vital (P0_23). The transition between the sound qualities (P0_ 22) and (P1_22) is fragmented.

The tempo changes, it alternates between quick and lively (P1_31) and very fast (P0_31). The transition between the tempi is fragmented.

The articulation is staccato (P0_33). The phrases begin with an accented or abrupt accent (P0_35).

The shaping, rhythmic pattern (P1_1) under free improvisation (P0_39) is recognisable.

The dynamic range extends between medium soft (P1_40), medium loud (P1_41) and very loud (P0_41). The transition between very loud and medium loud is fragmented.

VOCAL MUSIC ANALYSIS PROFILE

The vocal Music Analysis Profile is presented below (Figure 6).

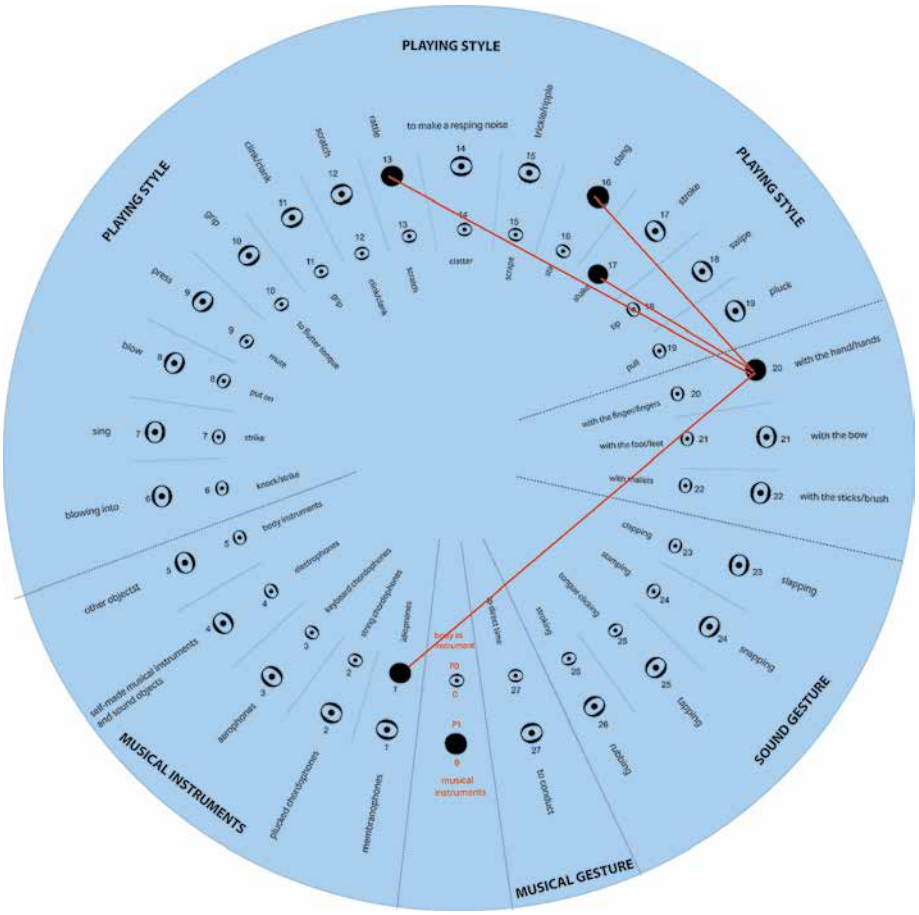


Figure 4. Playing Style – Profile.

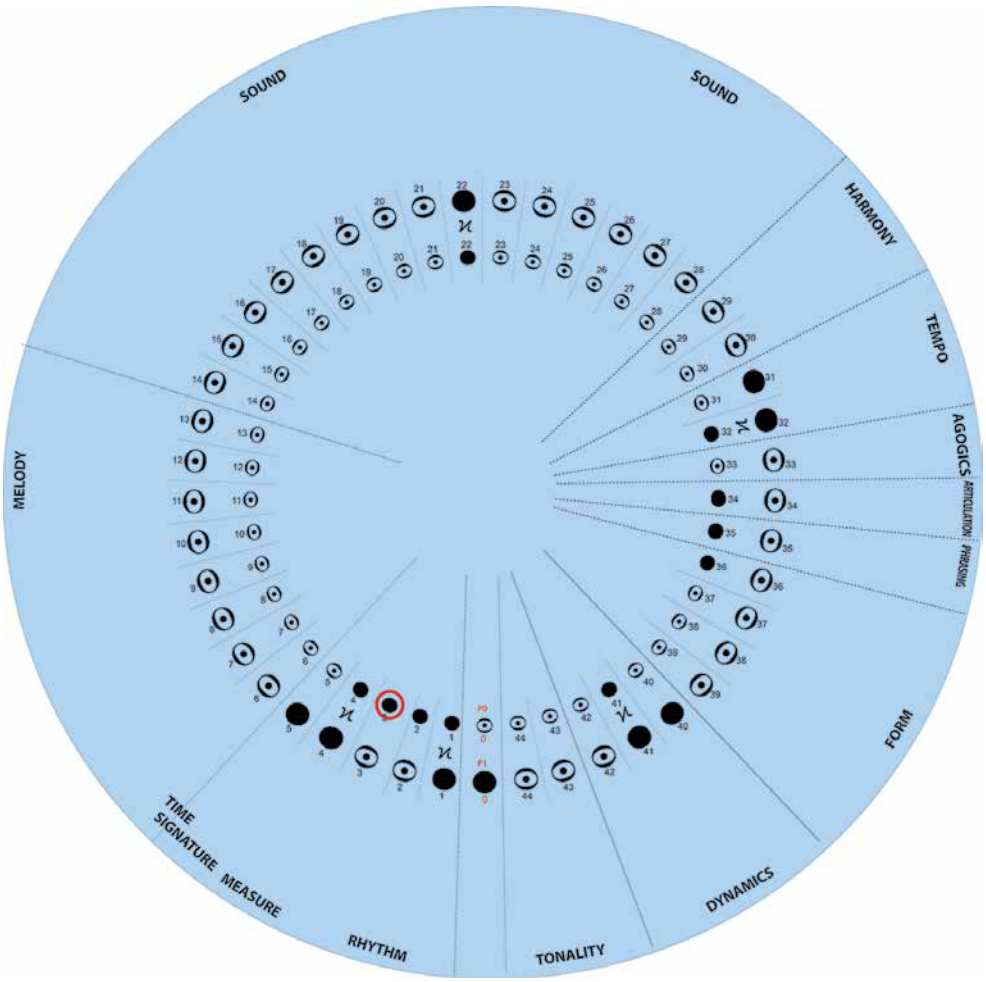


Figure 5. Instrumental Music Analysis – Profile.

The vocal music is audible (P1_0).

In the vocal expression of the patient, a melodic theme (P0_6) of the rhythmic patterns (P0_1) is recognisable. The rhythm is simple (P0_2). The melody line is formed from sound jumps (P0_9), sound steps (P1_9), consonant intervals (P0_28) and repeated notes (P0_11). The ambitus is medium (P1_11). The course of the melodic line consists of an ascending movement/question (P0_10) and a descending movement/answer (P1_10). The transitions between melodic leaps and steps, between the melodic question and answer and between the repeated note and the ambitus are flowing.

The sound is sometimes simple, modest and shy (P0_20) and sometimes vital and lively (P0_23). Dynamically, the melody is initially louder (P0_42) and finally quieter (P1_42). Considered agogically the first two tones are faster (P0_32) and the last three tones slower (P1_32). The transitions between louder and softer and between fast and slowing down are flowing.

The articulation is staccato (P0-33) and legato (P1_33). The transition between staccato and legato is flowing. The phrase is also flowing (P1_35).

The vocal utterance is tonal (P0_43) and in the major. It has the form of free improvisation (P0_39).

INSTRUMENTAL AND VOCAL MUSIC ANALYSIS PROFILES. A COMPARISON

The analysis of the instrumental and vocal profile of the patient reveals that the two expressions differ (Table 9).

The music is audible in two expressions – instrumental and vocal. Neither expression is uniform throughout, but they show similarities and differences in the instrumental and vocal expression of the patient (Table 10).

The music can be heard in both expressions. In both the vocal and the instrumental expression, there are rhythmic patterns. The rhythm is simple. The measure is regular and pulsating. The time signature is simple. The sound is lively and vital. The tempo oscillates between faster and slowing down in a rapid, agile manner. The articulation is staccato. The form is a free improvisation. The dynamics is mezzo piano.

The instrumental play is characterised by pauses while the vocal utterances form closed phrases. In instrumental play, the measure is alternately ametric and regular. In the vocal utterance, the measure is regularly pulsating.

The patient plays musical instruments on which no melody formation is possible. His singing consists

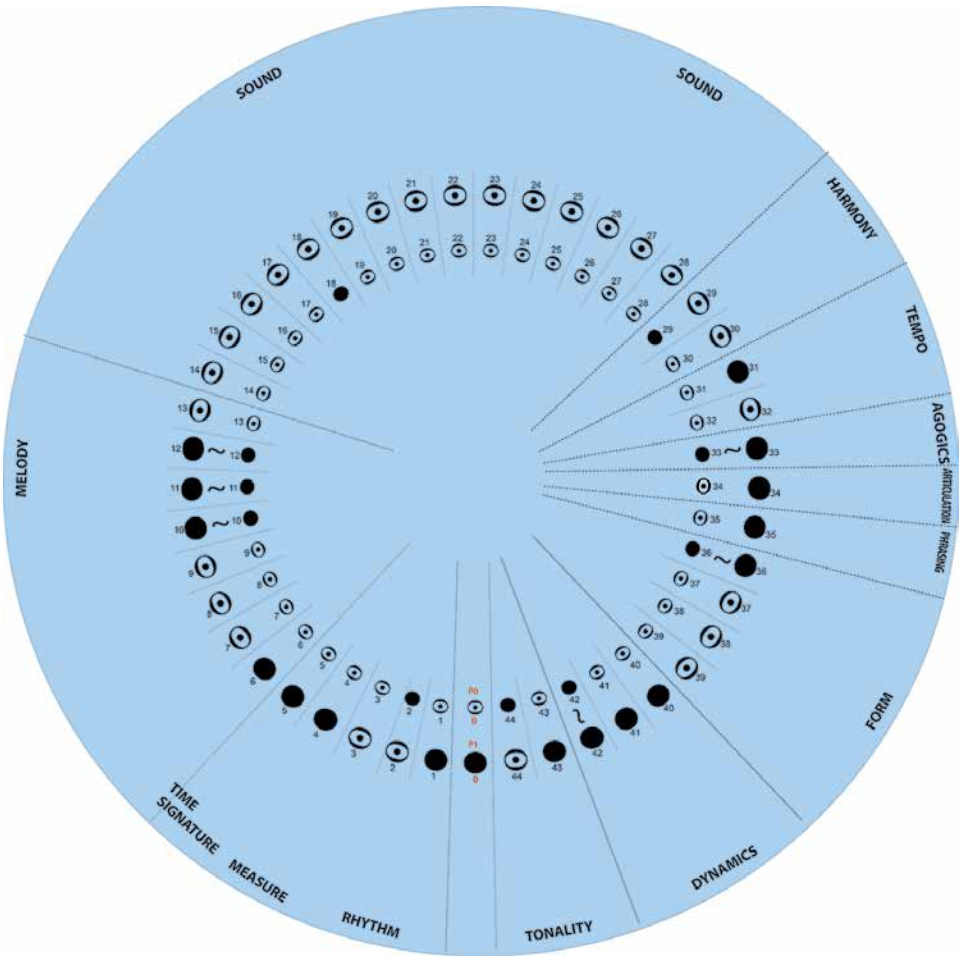


Figure 6. Vocal Music Analysis – Profile.

Table 9

Instrumental and vocal Music Analysis Profiles

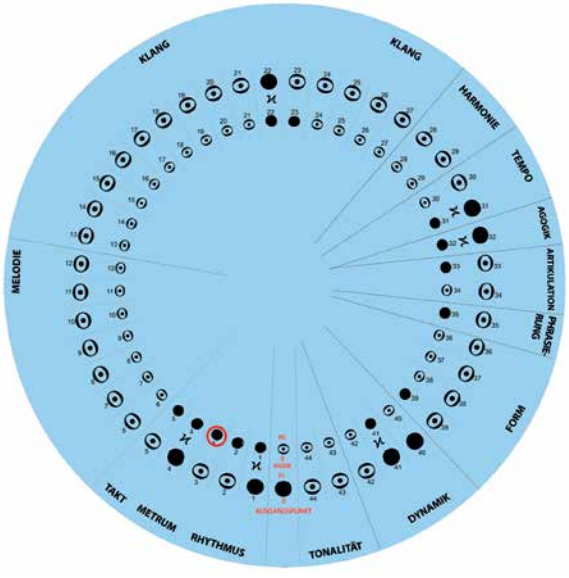
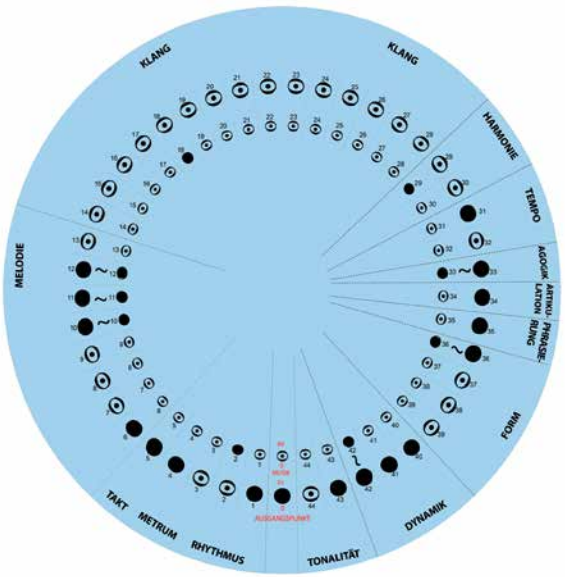
Instrumental Music Analysis – Profile	Vocal Music Analysis – Profile
	

Table 10

Instrumental und vocal music. Similarities and differences

Instrumental music	Potentials	Vocal music
audible music	P1_0	audible music
arrhythmic/pre-rhythmic	P0_1	
rhythmic pattern	P1_1	rhythmic pattern
simple rhythm	P0_2	simple rhythm
rests	P0_3	
ametric, irregular, changing	P0_4	
metric, steady, pulsating	P1_4	metric, steady, pulsating
simple time signature	P0_5	simple time signature
	P1_6	melodic theme
	P0_9	skips/jumps/leaps
	P1_9	steps
	P0_10	ascending movement/question
	P1_10	descending movement/answer
	P0_11	note repetition
	P1_11	ambitus/range
	P0_20	simple, modest, shy
scared, shaky	P0_22	
impulsive, aggressive, explosive, combative	P1_22	
vital, lively, voluminous	P0_23	vital, lively, voluminous
	P0_28	consonant intervals
	P1_30	moderate
very fast	P0_31	
quick, lively	P1_31	quick, lively
become faster/accelerando	P0_32	become faster/accelerando
become slower/ritardando	P1_32	become slower/ritardando
staccato	P0_33	staccato
	P1_33	legato
accentuated, emphasized, abrupt	P0_35	
	P1_35	held, carried, flowing
free improvisation	P0_39	free improvisation
mezzo piano	P1_40	mezzo piano
fortissimo	P0_41	
mezzo forte	P1_41	
	P0_42	become louder/crescendo
	P1_42	become softer/decrescendo
	P1_43	tonal: major or minor
fragmentary transition	transition	flowing transition

of a melodic theme with jumps, steps and consonance. The melody is in the form of a song that consists of an upward movement/question and a downward movement/answer. The notes of the melody are repeated. The melody has an average ambitus. It sounds simple, modest and shy.

However, the instrumental play sounds impulsive, explosive and combative and turns anxious and shaky at times. In both forms, the sound changes and is alive and vital.

The pace when singing is sometimes moderate, moderato and then rapid, agile. When playing, the pace alternates between very fast and quick.

When singing, the notes are legato and staccato, and the playing is staccato.

The phrase starts accentuated and emphasized; the singing is flowing.

The patient sings medium soft and is thereby initially louder and softer at the end. The music is played medium low, medium loud and very loud.

The tonality of the song is in a major key.

The transitions when playing are fragmented and flowing when singing.

DISCUSSION

The inclusion of the body, its qualities and the movement in music therapy treatment enhances diagnostic capabilities, which in some patient populations do not exist beyond the purely musical level.

The previously developed research approaches place the music at the centre of the observation and analysis. The body and movement can be studied in addition to the music.

BMMS analyses and describes the following bodily movement phenomena alongside musical elements: use of body parts, body posture, body planes, body axes, the kinesphere, the body split, the unipolar and bipolar form flow, the spatial reference, the physical proximity and distance, the body contact, the touch function, motor activity, the state of the muscles, the flow of movement, the use of strength and the level of intensity of the movement, the relationship of the body to gravity, the movement form, the body forms, the movement pattern, direction, radius, tempo, articulation, mode, differentiation, and the targeting of the movement as well as the varieties of musical instruments. At the musical level, the following musical elements are analysed: rhythm, measure, timing, melody, sound, harmony, tempo, agogic, articulation, phrasing, form, dynamics and tonality.

With the current BMMS model, bodily behaviour and expression, movement behaviour and the expression of movement, the varieties of musical instruments and musical expression can be analysed and described in the music therapy treatment as three equivalent components of the investigation: body, movement and music.

With the BMMS, the facial expression, the gaze and eye contact and breathing and its expression are not analysed.

This article describes the application of BMMS using an example of music therapy treatment. To verify the applicability of the model in practice, it would be useful to examine an entire music therapy process to determine what caused changes in bodily, movement aspects and the musical expression of the patient.

For the development of the model, a proof of reliability should be provided to verify the reliability and limitations of the model in practice and to demonstrate the use of BMMS both for practical and clinical work, for documentation purposes and to impact research in music therapy.

CONCLUSIONS

Music therapy treatment – in addition to the music – involves working with the body and with movement. Therefore, it would make sense to give greater importance to the analysis and description of the physical and movement expression, in conjunction with the musical expression in music therapy. This would encourage interdisciplinary and practice-relevant research. It would also be interesting to carry out an investigation analysing the body, movement and music based on correlates and differences explaining how important this could be for music therapy.

In the training of music therapists, integrated training in BMMS could contribute to the improving clinical perception and differentiation of budding music therapists with regard to the body, its features and bodily expression, and the expression of movement in connection with the musical expression. Describing and understanding what is reflected in the bodily, movement behaviour, in playing behaviour and the musical expression of the patient, allows the music therapist to understand the patient and to come in contact with them to provide them with music therapy.

Further research is indicated to ensure proper application and development of the BMMS for music therapy practice, not only for schizophrenic patients but also to be extended to other populations and future applications.

ACKNOWLEDGMENTS

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My special thanks to Yona Shahar-Levy from Jerusalem (Israel), where I studied the Emotorics-Emo-

tive Body Movement Mind Paradigm model intensively. The article is dedicated to Yona Shahar-Levy.

Endnote

1 The patient's name has been changed.

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