

Observing processes reflected in and through music: a coding scheme to monitor music therapy

A. Raglio¹, D. Traficante^{2,3}, O. Oasi²

1 Music Therapy School “Glass Harmonica”, Anni Verdi Association, Rome, Italy

2 Department of Psychology, Catholic University, Milan, Italy

*3 CRIdee – Research Center on Developmental and Educational Dynamics Technologies ,
Catholic University, Milan, Italy*

Introduction

Two main approaches to the treatment research in psychotherapy emerged: *efficacy research* and *effectiveness research*. The former is carried out to verify if a specific therapeutic approach leads to a remission of the patient's symptomatology. It is based on the experimental research design, in which a control group and an experimental group, randomly selected (*Randomized Controlled Trial-RCT*), are compared. This method rises the internal validity of the research, but does not allow the generalization of the results to the usual clinical practice.

The later investigates the usefulness of "new" treatment to the circumstances of clinical practice. In this field quasi-experimental designs and/or systematic naturalistic observations are used. These methods show a degree of internal validity lower than RCT, but give results more easy to be generalized to the clinical practice.

From this point of view, the goal is to quantify data from clinical practice in such a way as to derive scientifically valid generalization across cases (Westen, Novotny & Thompson-Brenner (2004) Westen et al., 2004).

The aim of our work was to present an instrument to observe and to evaluate changes in the interactive behavior between patient and therapist during music therapy sessions. The theoretic framework which we referred to is the psychodynamic theory, in particular, the Stern's theory of *affect attunement* and the Benenzon's approach to music therapy.

The psychodynamic framework

According to Stern, the dance and the music are examples of the expression of the vitality affects (Stern, 1985) and contribute to determine the conditions of the affect attunement, on which a primitive sense of Self is built on.

The Benenzon's music therapy approach

This approach (Benenzon, 1981) is based on the use of the sonorous-musical improvisation in a non-verbal context. The sonorous-musical element is conceived as the expression of the sonorous identity (“iso”), whose roots are deep and archaic: they are “essential” sounds, sonorous-musical elements used by the MT and by the patient in an expressive and relational key.

Our hypothesis is that the sonorous element takes much part in the process of the mutual regulation of the emotions between patient and music therapist (MT) as well as between the infant and its caregiver (Tronick, 1989).

From the attunement, favoured by the use of the music-sound element, the intersubjective relationship emerges. The indicators of this relationship are the following (Stern, 1985): the **attentive compartecipation**, the **intention compartecipation** and the **affects compartecipation**.

The three indicators are present even in the music therapy process: if music therapist and patient focus their attention on the music-sound event, the attentive compartecipation is gradually reached. The intention compartecipation implies the intentionality of the music-sound gesture, through which the patient falls in relationship with the MT. Finally, the music-sound event can induce an emotional and affective involvement in the dyad, leading to the affects compartecipation.

Indicators of attunement

The attunement, in a music therapy session, is present when:

- in the productions of MT and patient the profile of the sound intensity is analogous;
- the music-sound interchanges have the same rhythm;
- the rhythm is followed in a synchronic or in an antiphonal way by patient and MT;
- it is possible to identify a relationship between the latencies of the two productions;
- there is a shape analogy in rhythmic and/or melodic framework.

The Music Therapy Coding Scheme

(Raglio, A., Traficante, D., Oasi, O. (2006). A coding scheme for the evaluation of the relationship in music therapy sessions, Psychological Reports, 99, 85-90)

The attunement process between MT and patient seems to be the most important index of the quality of the therapeutic process. To assess this interactive modality, we built a coding scheme that can be applied to videorecordings.

We developed the **Music Therapy Coding Scheme (MTCS)** as assessment method for videorecordings of music therapy sessions. The MTCS is a video-based, patient-therapist interaction assessment method measuring both the affective and behavioral characteristics expressed by the patient and the therapist in a dyadic interaction during a music therapy session.



We identified 4 behavioral classes:

- 1) ***Non Verbal Communication***, that includes the spatial collocation in relation to the other and to the musical instruments, the actions made in relation to the other and to the musical instruments, the expression of the emotions;
- 2) ***Countenance***, referring to looking at each other, at the musical instruments, and at the environment;
- 3) ***Verbal communication*** in terms of presence or absence. In case of presence, the interactions are coded as pertinent or not to the music therapy interaction;
- 4) ***Sonorous-Musical communication***, referred to the quality and the shape of the musical interactions.

To code the videorecordings we used ***The Observer Video-Pro 5.0*** software. We chose a continuous recording method.

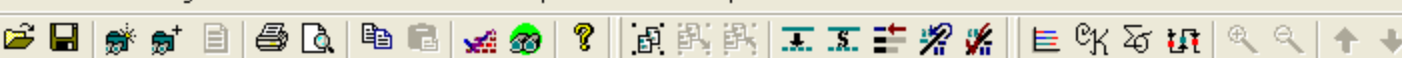


Dialogo sonoro

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- interazioni musicali quint**
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interazioni musicali quint - Behavioral Classes [Read-Only]

	Name	Description	Type	Elements
1	CNV	Comunicazione non verbale	Nominal	DEAMBULAZIONE, STAT, STAT-CHIUSURA, MOV SINTON, AG ...
2	SGUARDO E MIMICA	Espressioni del volto	Nominal	SQUAR ALTRO, SQUAR STRUM, SQUAR ALTRO SORR, SQUA ...
3	CNV SONORA	Comunicazione non verbale sonoro-musicale	Nominal	PROD ASINTON, PROD SINTON, ASSENZA PROD, PROD INDIV ...
4	CV	Verbalizzazioni	Nominal	CV CONGRUA, CV ESTRANEA, ASSENZA CV, ALTER ...
5 *				



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interazioni musicali quint - CNV SONORA - Behaviors [Read-Only]

	Name	Description	Code	Modifier Class 1	Modifier Class 2	Properties
1						
2	PROD ASINTON	Non c'e reciprocita. S. non segue e/o non si adegua a uno o piu dei seguenti parametri: pulsazione rit, andamento mel, struttura arm.	Pr	None	None	State
3	PROD SINTON	C e reciprocita. S. segue e/o si adegua a uno o piu dei seguenti parametri: pulsazione rit, andamento mel, struttura arm. Implica sovr son e/o artif.	aq	None	None	State
4	ASSENZA PROD	Assenza di produzione sonoro-musicale	As	None	None	State
5	PROD INDIV	S. produce individualmente	ar	None	None	State
6	PROD ISOL	S. produce isolatamente utilizzando uno strumento e/o la voce e/o il corpo	ay	None	None	Event
7	PAUSA MUS	Assenza di suono nell ambito di una stessa produzione sonoro-musicale	PA	None	None	Event
8	VARIAZIONI	Presenza di variazioni rispetto a: andamento ritmico, agogica, intensita e timbro	Va	None	None	Event
9	CAMB STRUM	S. effettua un cambio di strumento nella produzione	Ca	None	None	Event
10	AGGIUNTA STRUM	S. inserisce nella produzione l utilizzo di strumenti che si aggiungono a quello utilizzato	at	None	None	Event
11	ESCLUSIONE STRUM	S. sospende la produzione con uno degli strumenti utilizzati	Es	None	None	Event
12	ALTRO	Non e' possibile categorizzare alcun comportamento	n	None	None	State
13*						

Reliability assessment

METHOD

Participants were seven children (3 males; 4 females) aged 3-10 years (mean age = 6,28), diagnosed with autism disorders, and seven MTs.

Procedure. The patient-therapist dyads were videorecorded by a fixed videocamera, positioned in a corner of the room in which the music therapy session took place. We considered the 1st session for each patient. The observers were two psychologists and two MTs. The videos were assessed independently by each of the two couples including one psychologist and one music therapist. We coded the 15 min. middle part of each videotape.

RESULTS

It is worth noting that a large variability between subjects emerged, even though they shared the same psychiatric diagnosis. So, we chose to compute **Cohen's k coefficients** on single case's data.

For the *Verbal communication* class we did not find any disagreement between the two couple of observers: the behaviors of this class are a rare occurrence in a music therapy setting and they are easy to be noted.

Table 1 shows that k coefficients (computed by a frequency based comparison method) for the behavioral classes *Non Verbal communication* and *Countenance* are quite good, with an exception for the Countenance coded about C.C. This patient looked to the floor the most of time and so it was very difficult to code any change.

The k coefficient values of the *Sonorous-musical communication* class are lower, but adequate anyway.

Table 1 Cohen's K coefficients for each behavioral class, by subjects

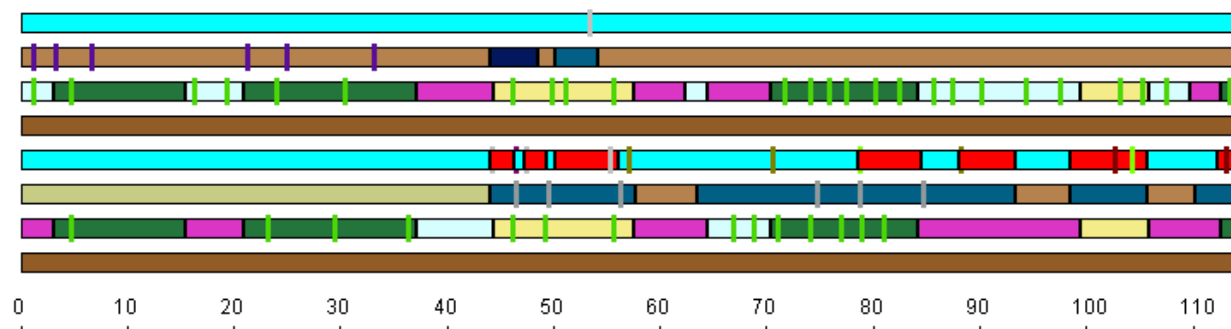
CASE	GENDER	AGE (years)	NON VERBAL COMMUNICATION	COUNTENANCE	SONOROUS-MUSICAL COMMUNICATION
1. S.Q.	Male	6	.85	.87	.88
2. G.B.	Male	3	.88	.88	.76
3. M.C.	Female	7	.85	.83	.80
4. P.A.	Male	5	.87	.85	.78
5. C.S.	Female	6	.88	.89	.75
6. A.C. ^a	Male	7	1	.90	.78
7. C.C.	Female	10	.89	.59	.74

^a A.C. was very static and he usually looked around, showing little interest for sonorous-musical productions.

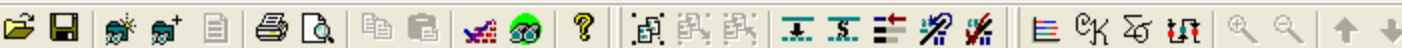
The **Alpha coefficients** computed on the total time duration of the behaviors of this class (Figure 1) show that the duration of the episodes of disattunement, attunement, individual production or absence of production was reliably coded.

The two coefficients (k and α) for this behavioral class indicate that some disagreement in coding the sonorous-musical communication behaviors emerged if the interactive episode was quite brief, while if the sonorous dialogue was long enough, observers had not difficulty in coding it.

Subject	Behavioral Class
Terapeuta	CNV
Terapeuta	3GUARDO E MIMIC,
Terapeuta	CNV SONORA
Terapeuta	CV
Paziente	CNV
Paziente	3GUARDO E MIMIC,
Paziente	CNV SONORA
Paziente	CV



Legend									
Behavior	Color/Pattern	Behavior	Color/Pattern	Behavior	Color/Pattern	Behavior	Color/Pattern	Behavior	Color/Pattern
ALL ALTRO	[Olive Green]	AVV ALTRO	[Dark Red]	MOV SINTON	[Grey]	PROD SINTON	[Dark Green]	SQUAR STRUM FL	[Purple]
ALL FISICO	[Light Green]	AVV FISICO	[Bright Green]	NULLA	[Light Olive]	SQUAR ALTRO	[Brown]	STAT	[Cyan]
ALL STRUM	[Grey]	AVV STRUM	[Purple]	PAUSA MUS	[Light Green]	SQUAR ALTRO FL	[Grey]	STAT-CHIUSURA	[Magenta]
ASSENZA CV	[Brown]	CV CONGRUA	[Magenta]	PROD ASINTON	[Yellow]	SQUAR NON OR	[Dark Blue]		
ASSENZA PROD	[Magenta]	DEAMBULAZIONE	[Red]	PROD INDIV	[Light Blue]	SQUAR STRUM	[Dark Blue]		

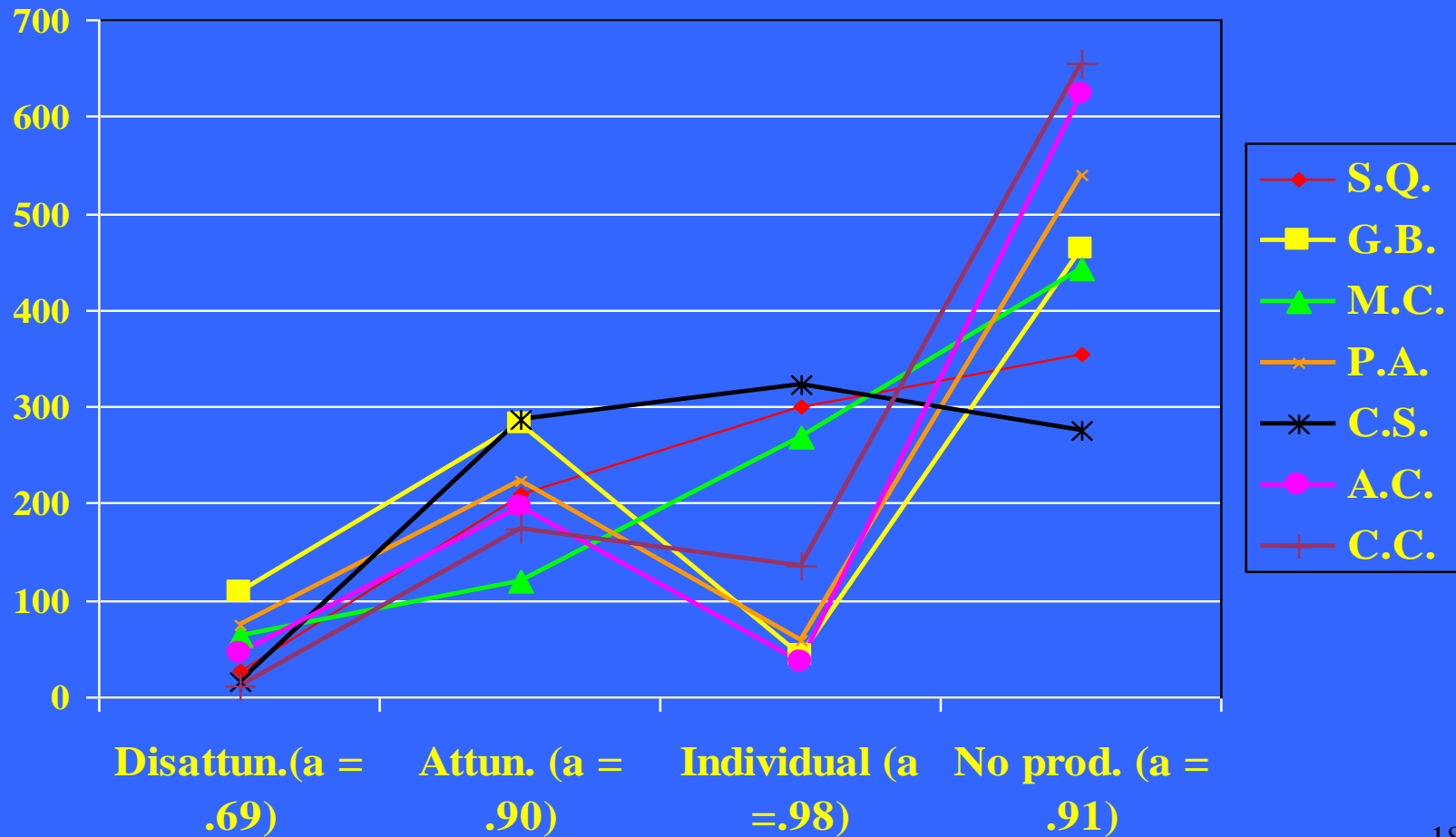


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	Subject	Behavior							
Statistic			Total number	Rate (number	Total duratio	Total duration (% of o	Mean duration	Mean total of observations	
	Terapeuta	SGUAR STRUM	16	1.08	179.72	20.20	11.23	16.00	
	Terapeuta	SGUAR NON OR	4	0.27	43.36	4.87	10.84	4.00	
	Terapeuta	SGUAR ALTRO FU	7	0.47	-	-	-	7.00	
	Terapeuta	SGUAR STRUM FU	44	2.97	-	-	-	44.00	
	Terapeuta	PROD ASINTON	7	0.47	94.60	10.63	13.51	7.00	
	Terapeuta	PROD SINTON	13	0.88	125.20	14.07	9.63	13.00	
	Terapeuta	ASSENZA PROD	22	1.48	441.60	49.63	20.07	22.00	
	Terapeuta	PROD INDIV	23	1.55	228.32	25.66	9.93	23.00	
	Terapeuta	CV CONGRUA	17	1.15	11.12	1.25	0.65	17.00	
	Terapeuta	ASSENZA CV	18	1.21	878.60	98.75	48.81	18.00	
	Paziente	DEAMBULAZIONE	12	0.81	61.08	6.87	5.09	12.00	
	Paziente	STAT	21	1.42	722.76	81.23	34.42	21.00	
	Paziente	STAT-CHIUSURA	8	0.54	105.88	11.90	13.24	8.00	
	Paziente	AVV ALTRO	6	0.40	-	-	-	6.00	
	Paziente	ALL ALTRO	5	0.34	-	-	-	5.00	
	Paziente	AVV STRUM	5	0.34	-	-	-	5.00	
	Paziente	ALL STRUM	4	0.27	-	-	-	4.00	
	Paziente	AVV FISICO	6	0.40	-	-	-	6.00	
	Paziente	SGUAR ALTRO	15	1.01	190.20	21.38	12.68	15.00	
	Paziente	SGUAR STRUM	12	0.81	551.84	62.02	45.99	12.00	
	Paziente	SGUAR NON OR	6	0.40	74.04	8.32	12.34	6.00	
	Paziente	SGUAR ALTRO FU	14	0.94	-	-	-	14.00	
	Paziente	SGUAR STRUM FU	7	0.47	-	-	-	7.00	
	Paziente	NULLA	4	0.27	73.64	8.28	18.41	4.00	
	Paziente	PROD ASINTON	7	0.47	94.60	10.63	13.51	7.00	
	Paziente	PROD SINTON	13	0.88	124.00	13.94	9.54	13.00	
	Paziente	ASSENZA PROD	24	1.62	385.36	43.31	16.06	24.00	
	Paziente	PROD INDIV	18	1.21	285.76	32.12	15.88	18.00	
	Paziente	CV CONGRUA	3	0.20	1.92	0.22	0.64	3.00	
	Paziente	ASSENZA CV	4	0.27	887.80	99.78	221.95	4.00	

caso06a \ caso05aCS \ caso04aPA \ **caso03aMC** \ caso02aGB \ caso

**Figure 1 Sonorous-Musical communication behaviors:
Mean total time duration (sec) and Alpha coefficients**



CONCLUSIONS

The results show that MTCS can give reliable data about the characteristics of a music therapy session, that we selected.

In particular, it is remarkable that the Sonorous-Musical communication class too had good k coefficient values. They demonstrate that it is possible to operationalize in behavioral terms even a very complex theoretic construct as the *affect attunement* (Stern, 1985), if the observers had a specific training in music therapy.

The next step of our work was to evaluate if the indicators we chose are able to point out elements about the relationship patient-MT that are really relevant to assess the differences among subjects (criterion validity assessment) and the changes in the music therapy process.

A work conducted according to the RCT procedure showed the usefulness of the MTCS to assess efficacy of music therapy in the treatment of Alzheimer Disease (Raglio, A., Bellelli, G., Traficante, D., Gianotti, M., Ubezio, M.C., Villani, D.M., Trabucchi, M. (2008). Efficacy of music therapy in the treatment of behavioral and psychiatric symptoms of dementia, *Alzheimer Disease & Associated Disorders - An International Journal*, 22 (2), 158-162).

New research projects are in progress to integrate the behavioral observations with some physiological indicators, such as blood pressure or ECG signal during music therapy sessions.

Thank you for your attention