


Psychometric Results of the Music Therapy Scale (MAKS) for Measuring Expression and Communication

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Abstract

The Music Therapy Rating Scale (MAKS), originally developed in 1996, was evaluated again in 2009 using a sample of 62 children from a psychiatric unit and from different primary schools, with measures at three different time points during therapy process. The scale is intended as an objective rating of a client's musical behavior. The evaluation of the scale was to determine any possible ambiguity or weakness in the discriminatory power of the scale items. After excluding such items, the results show high reliability ($\alpha > .75$) and good objectivity with trained raters ($r > .70$) for the two main scales and a significant sensitivity to change.

Keywords

musical communication, musical expression, music therapy, rating scale MAKS

There has been an urgent need for evaluation in music therapy over the past years, and specific assessment instruments for music therapy are still missing, especially for patients who cannot be evaluated by verbal tests (Aldridge, 1996; Tischler, 2000). It is important in clinical practice that we describe in detail the patient's mental state and psychic structure. Therefore, we need to identify specific criteria for the assessment of a client's musical expression. The question remains as to how we interpret what we hear in a musical context in terms of both relationship and expression and the implications of this interpretation for therapy.

Music Therapy Rating Scales

Music therapy rating scales already exist in the literature (for an overview, see Phan Quoc, 2007; Sabatella, 2004). Many of them, however, are neither specific to music therapy nor validated. In Germany, semantic differentials are often used for describing improvised music during music therapy intervention. These differentials are bipolar adjective lists with scales divided into five or seven intervals to rate a subjective impression of what is heard. They were used by music therapy researchers in the 1990s due to a shortage of specific scales for music therapy (Burrer, 1992; Inselmann & Mann, 2000; Pechr, 1996; Steinberg & Raith, 1985; Steinberg, Raith, Rossnagel, & Eben, 1985; Vanger, Oerter, Otto, Schmidt, & Czogalik, 1995; Zahler, 2002).

As specific music therapy rating scales, Bruscia's Improvisation Assessment Profiles are often used in music therapy research in English-speaking countries (Bruscia, 2001), but these have yet to be validated. Maler's (1989) scale is partly validated but is very complicated in applying ratings and is no longer implemented. The Nordoff/Robbins rating scales (Nordoff, Robbins, Fraknoi, & Ruttenberg, 1980a, 1980b), used primarily with children with disabilities, are now under evaluation. Schumacher's Assessment of the Quality of Relationship (Schumacher, 1999; Schumacher & Calvet, 2007; Schumacher & Calvet-Kruppa, 1999) is currently being evaluated for its application to people with mental disorders other than autism. Pavlicevic's Music Interaction Rating scale (Pavlicevic, 1991, 2007), describing the patient's level of contact during musical improvisation in music therapy, has been validated for use with psychiatric patients. The challenge of

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Table 1. The Music Therapy Rating Scale (MAKS): Expression and Communication Subscales

MAKS	
Expression scale: rating improvised solo playing (14 items)	Communication scale: rating improvised duo playing with the therapist (13 items)
(Dealing with the instrument)	(Engagement)
Range of melody (TR)	Autonomy (AT)
Initiative (IN)	Inner participation (BT)
(Form/musical figure)	(Formal aspects)
Form (FG)	Need of space (RA)
Structure (ST)	Length of playing intervals (DA)
Variation (VR)	Logic structure (LA)
(Vitality/dynamics of expression)	(Regarding the other)
Suspense/tension (SP)	Reference (BZ)
Power (SK)	Intensity of contact (KI)
Vitality (LB)	Contact behavior (KV)
Flow (SF)	Variability in acting (VV)
Dynamics (DY)	Dominance (DO)
(Quality of expression)	(Quality of expression)
Sound quality (KQ)	Quality of flow (DQ)
Quality of expression (AU)	Quality of affects (AQ)
Clarity of emotions (EA)	Quality of play (SQ)
Resonance/involvement (EL)	

Hypothetical categories are in brackets.

measuring the music therapy outcome with young and adolescent psychiatric patients, however, has not been addressed.

A question remains about whether scales, conceptually based on developmental psychology, are appropriate for children without developmental disabilities or severe psychiatric disorders, but who are, nevertheless, unstable in both emotional expression and social interaction. We identified the need for a music therapy rating scale specifically for measuring musical behavior on more than one dimension in order to depict the client's behavior that included dissent, inconsistency, and ambivalence. A rigorous scale could then be used for the initial assessment process and for a final assessment at the end of therapy, making it a useful tool for an evaluation of therapy outcome. While we have diagnostic scales, we have no rating scales for assessing therapeutic change.

Development of the Scale and First Results of Validation

Development of the Music Therapy Rating Scale (MAKS) began in 1994 with a survey of music therapy experts (Moreau, 1996). In a process of item testing and reduction, the scale has been modified in clinical practice for several years. For the final version, the MAKS was composed of two subscales. One, the Expression scale, is 14 items for rating a client's improvisational musical performance in a solo playing. The second, the Communication scale, is 13 items for rating a client's improvisational musical performance in duo playing with the therapist (for an overview of the scale's categories see Table 1).

For scoring purposes, all items were divided into seven levels. Each level was operationalized, creating precise descriptions to avoid ambiguity (of some items; see Table 2).

This scale was validated in 1996 by an initial evaluation process with 52 raters on the basis of 10 video scenes of different adolescent patients in a psychiatric clinic (Moreau, 1996, 2003). Scores allowed significant differentiation between clients with various psychiatric disorders ($p < .001$). The results for objectivity (mean interrater correlation: Kendall's tau = .4 for the Expression scale and .3 for the Communication scale) needed to be improved, but the retest results suggested that a training of the raters may slightly improve the score for objectivity.

The experiences of Plum (Plum, Lodemann, Bender, Finkbeiner, & Gastpar, 2002) and Isermann (2001), testing the practicability of the scale in a clinical context with adults with schizophrenia, encouraged us to revise the scale and to reevaluate it in a clinical setting.

Aim and Hypotheses

The main task of the actual study was to evaluate the MAKS again with trained raters, according to the general psychometric criteria of objectivity and reliability and to establish its usefulness, clinical applicability, and relevance.

1. Testing reliability shows to what extent the scales are free of measurement error. The a priori criterion for accepting reliability according to psychometric standards (see Bortz & Döring, 2006) was set at a Cronbach's alpha greater than .75.
2. The objectivity of a scale shows to what extent the raters agree in their judgment. The a priori criterion for accepting objectivity according to psychometric standards was set at a Pearson's interrater correlation greater than .7.
3. Sensitivity to change shows to what extent the scale will detect the development of the client's musical expression or communication skills throughout the duration of therapy. The a priori criterion for accepting the hypothesis was significance (tested by MANOVA with the factors Psychopathology and Time of Measurement), $p < .05$, for the within-subject factor Time.

Methodological Design

Procedures

For the rating of the children's musical behavior, we produced video recordings of each child in a standardized assessment session of about 15 minutes at three measurement points in time (t_1 = at the beginning, t_2 = in the middle, and t_3 = at the end of music therapy treatment or music workshop). In each assessment session, the child was asked to play by hand a large African drum alone, and then in a second episode to play it together with the therapist. During the duo play, the therapist was instructed to answer the child's offering on contact with

Table 2. Music Therapy Rating Scale (MAKS) Item Examples: Expression and Communication Subscales

Expression scale: Initiative (frequency of the client’s own ideas)						
No initiative (only plays when requested and/or offered assistance)	Very low-level initiative (reproduces only familiar musical patterns)	Low-level initiative (1-2 ideas)	Normal initiative (2-3 ideas)	High-level initiative (3-4 ideas)	Very high-level initiative (more than 4 ideas)	Extreme-level initiative (cannot restrain him- or herself)
Communication scale: Dominance (level the client places him- or herself under or above the therapist)						
Strongly subordinate (does not play or falls silent)	Moderately subordinate (conformist)	A little subordinate (partly conformist)	Equal	A little dominating (decisive, inviting)	Moderately dominating (influential)	Strongly dominating (overwhelming)

empathy and to stay cautious neither to force nor to push the child’s reactions more than necessary. From the videos of each assessment session, the therapist chose a representative scene of solo playing of 20 to 30 seconds for the rating of musical expression and a representative scene of duo playing with the therapist of 30 to 40 seconds for the rating of musical communication. The therapist decided which part of the video was typical or representative of the child’s behavior at that time of treatment. Finally, we had six video episodes for each participant, containing one solo and one duo scene from each time segment (t1, t2, t3). These video scenes from all children were assembled in random sequence and recorded on CDs for rating by three independent observers who had been trained in using the MAKS. These raters, three music therapy colleagues from different music therapy training backgrounds and with 3 to 5 years’ music therapy experience with children, watched the videos and scored the musical behavior of the children using the MAKS.

Instruments

For the evaluation of the children’s improvisational solo and duo play, we used the Expression and Communication scales of the MAKS, as described above. In addition, the children’s parents filled out a personality questionnaire, the Junior Temperament and Character Inventory (JTCI 7-11 R; Goth, Cloninger, & Schmeck, 2003; Goth & Schmeck, 2008). The personal nurse at the hospital or the parents, for the nonclinical group, filled out a short psychopathology questionnaire, the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001; German translation, Woerner et al., 2002).

Participants

Thirty-eight inpatients from a university hospital for child and adolescent psychiatry attended group music therapy sessions over a period of 4 weeks to 10 months, depending on the length of their hospital stay. Most of the patients had a main diagnosis of hyperkinetic disorder, F90, according to the International Classification of Diseases, Version 10 (ICD-10), and most had multiple diagnoses (see Figure 1).

In addition, 24 healthy children from different primary schools attended a music workshop of 10 sessions over a period

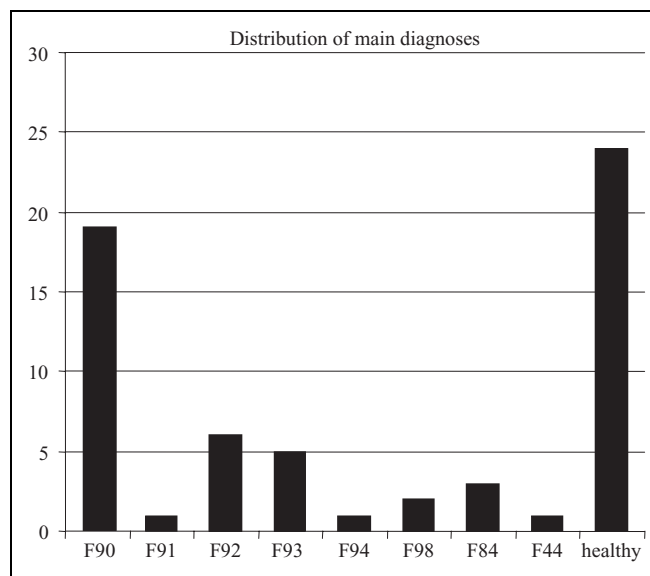


Figure 1. Main diagnoses (International Classification of Diseases, Version 10) of the children’s sample.

of 3 to 4 months. We selected only boys and only those children without impaired intelligence to assure that the groups were homogeneous in gender and cognitive ability—although the children differed in age (see Table 3).

Neither group differed in creativity (ANOVA $p = .958$, tested by JTCI 7-11 R), but they differed significantly in all other categories of temperament and character (ANOVA $p < .010$, tested by JTCI 7-11 R). We found significant differences in the SDQ total score (χ^2 test $p = .025$), in the categories prosocial behavior (χ^2 test $p = .000$) and problems with peers (χ^2 test $p = .008$). However, to our surprise, there were aspects of psychopathology in both groups. Some healthy controls displayed severe or minor social and emotional problems. The clinical group was poorer in both psychosocial adaptation and social skills.

Results

Reliability

The results for scale reliability were taken from the data of the 62 children’s first assessments (t1) at the beginning of therapy.

Table 3. Characterization of the Clinical Sample

	Inpatient participants (n = 38)	Control participants (n = 24)
Age (years, months)	9, 9 ($\pm 1, 7$)	8, 1 ($\pm 1, 5$)
Sex	Male	Male

The intelligence score (IQ) in the clinical group was taken from axis III of the International Classification of Diseases, Version 10 (Remschmidt et al., 2002). In the healthy group, IQ was controlled by school.

Table 4. Reliability of the Expression (A) and Communication (K) Subscales for Each Rater (G, C, B)

	G	C	B
Expression scale			
A: alpha	.80	.72	.75
(rit)	FG (.23) ST (-.16) EA (.15)	FG (-.20) ST (-.01)	FG (.11) ST (-.22) EA (.21)
A: alpha*	.88	.83	.83
A: rit-range*	.39-.74	.36-.74	.27-.81 (KQ)
Communication scale			
K: alpha	.85	.76	.81
(rit)	DA (.01) BZ (.08)	DA (.03) BZ (.13)	DA (.11) BZ (-.02)
K: alpha*	.88	.78	.84
K: rit-range*	.34-.85	.21-.64 (KV)	.23-.72 (LA)

For the subscales, alpha and rit = results for all items; alpha* and rit-range* = results with reduced items. FG = form; ST = structure; EA = clarity of emotions; DA = length of the play the client takes compared to the therapist; BZ = reference or extent of extraverted or introverted orientation.

We analyzed the ratings of each single observer separately to get an idea of the stability of these results. A first analysis on all items of the Expression scale and all items of the Communication scale showed a Cronbach's alpha coefficient greater than .70, but the corrected item total correlations of some items were below the criterion of .3 (see Table 4).

As these items (FG = form; ST = structure; EA = clarity of emotions; DA = length of the play the client takes compared to the therapist; and BZ = reference or extent of extraverted or introverted orientation) also had low objectivity scores, they were removed for a new analysis (in Table 4, see alpha* and rit-range*). The results then fulfilled the criterion alpha of greater than .75, and the range of the corrected item total correlation was improved too.

Objectivity

The scale's objectivity was measured by the interrater correlation of all three raters (Pearson's coefficient) for each single item to detect nonobjective items. We took the data of all children and all assessment sessions. These results were compared to the results gained in the first evaluation process (Moreau, 1996), and the results gained immediately after the rater training. Almost all items of the Expression scale fulfilled the

criterion (marked by the black line; see Figure 2) in one of the contexts (initial study in 1996, after training situation, and actual study)—except those items that were already mentioned in case of reliability: FG (form), ST (structure), and EA (clarity of emotions). In the Communication scale, we identified the items KI (intensity of contact) and DQ (dynamic quality) as not showing sufficient psychometric properties.

For the total score analysis of the Expression scale and the Communication scale, we used only those items with sufficient discriminatory power and that loaded on a stable factor in the factor analysis. Based on this selection criteria, the total score of the Expression scale, (without items FG = form, ST = structure, EA = clarity of emotions) showed an interrater correlation of $r = .9$, and the total score of Communication scale (without items RA = need of space, DA = length of playing intervals, BZ = extent of extraverted or introverted orientation or reference) was $r = .7$.

Sensitivity for Change

We tested sensitivity for change by MANOVA analysis with the factors Psychopathology (SDQ total score) and Time of Measurement (t1, t2, t3). For this analysis, we took the MAKS Expression total score and the MAKS Communication total score (all items of each scale except the weak items, as described above). The analysis of the solo plays showed significant changes over time in musical expression (within-subject factor time: $p = .023$). Analyzing the duo plays, we had even stronger effects of significant changes in musical communication (within-subject factor time: $p = .001$). We can conclude that the MAKS is sensitive to discrete changes in musical expression and communication.

Discussion

After excluding the weak items for all total score analyses, the total scores of the Expression scale and the total scores of the Communication scale present sufficient objectivity and reliability. The results on the level of item with different training conditions suggest that good training is absolutely necessary for using the scale.

The items of form (FG) and structure (ST) did not show sufficient interrater, nor corrected total item correlations. These items are ambiguous in operationalization, difficult to rate, and do not contribute to explaining musical expression skills. Other items like length of the play the client takes compared to the therapist (DA) and the extent of extraverted or introverted orientation (BZ) need better training. Children in a psychiatric setting often change their orientation while playing with an adult person and hardly show stable patterns.

The items clarity of emotions (EA) or intensity of contact (KI) can be removed from the scale. Ratings of intensity of contact or clarity of emotions do not depend on observable behavior but on the rater's personal impression. The scale has limitations when asked to portray the quality of various

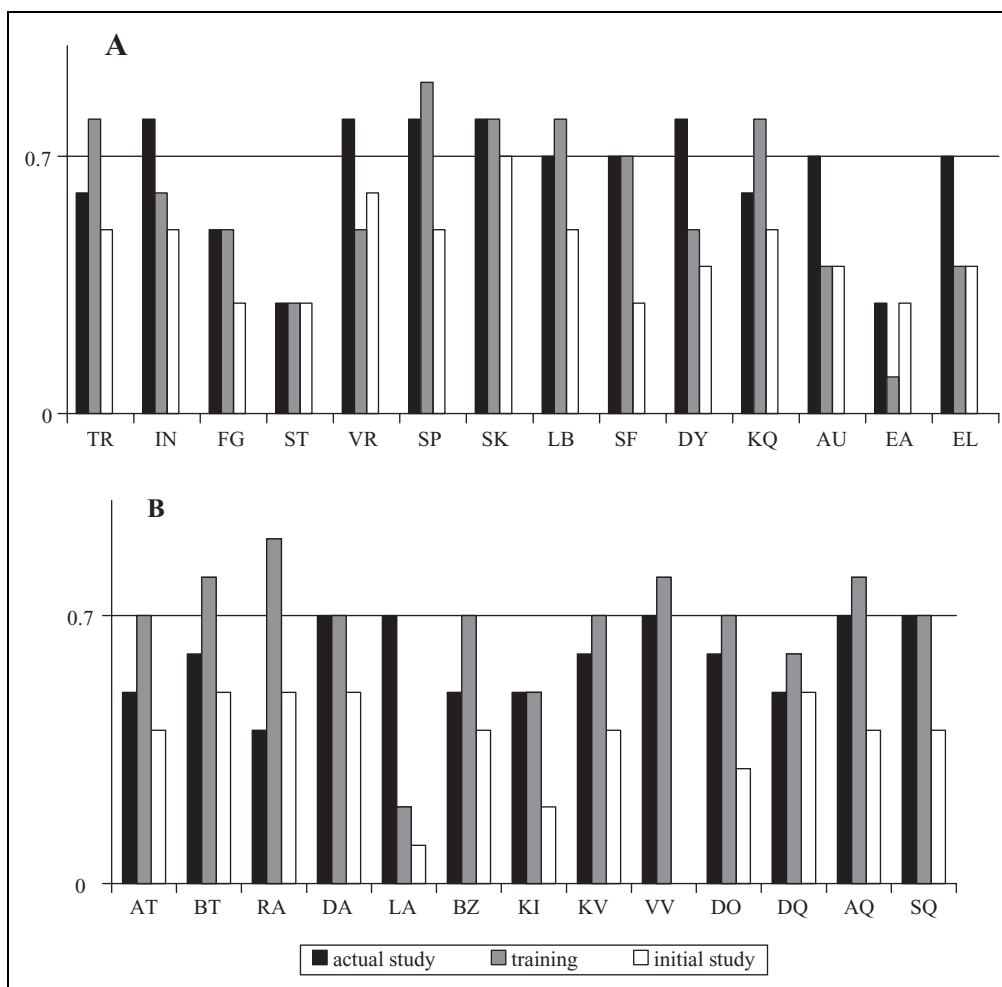


Figure 2. Objectivity (Pearson's correlation coefficient = y-axis) of the items (x-axis) of the Expression scale (Figure 2a) and the Communication scale (Figure 2b).

emotions or the intensity of contact between persons. On the other hand, the item inner participation (BT), operationalized by attention, is easier to observe.

The MAKES is a rating scale constructed by music therapy experts specifically for evaluating music therapy. The accurate description of each interval of the items allows a detailed reflection of a client's musical behavior. Therefore, the MAKES is more precise than semantic differential tests and presents a wider field of musical expression or communication skills as the scales examine more than one aspect of behavior. Inconsistent, or contradictory behavior of the client may be portrayed comparing the solo- and the duo-playing conditions and also comparing different aspects of musical expression, for example, tension (SP) and loudness (SK), or tension (SP) and movement (LB).

Conclusion

The MAKES is a scale constructed specifically to evaluate the musical expression and communication skills that occur

during music therapy. As an interval scaled rating instrument, the scale allows strong statistical methods for data analysis. When the weak items are eliminated, the scale fulfills the necessary psychometric standards of reliability and objectivity when it is used by well-trained raters. It is sensitive to change and can portray a child's development during therapy.

For further research, we have to determine group-specific characteristic profiles with regard to diagnosis, age, and/or gender to be able to give a clear diagnostic statement related to a patient's MAKES profile.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

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