

# Psychopathology

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# Psychopathology

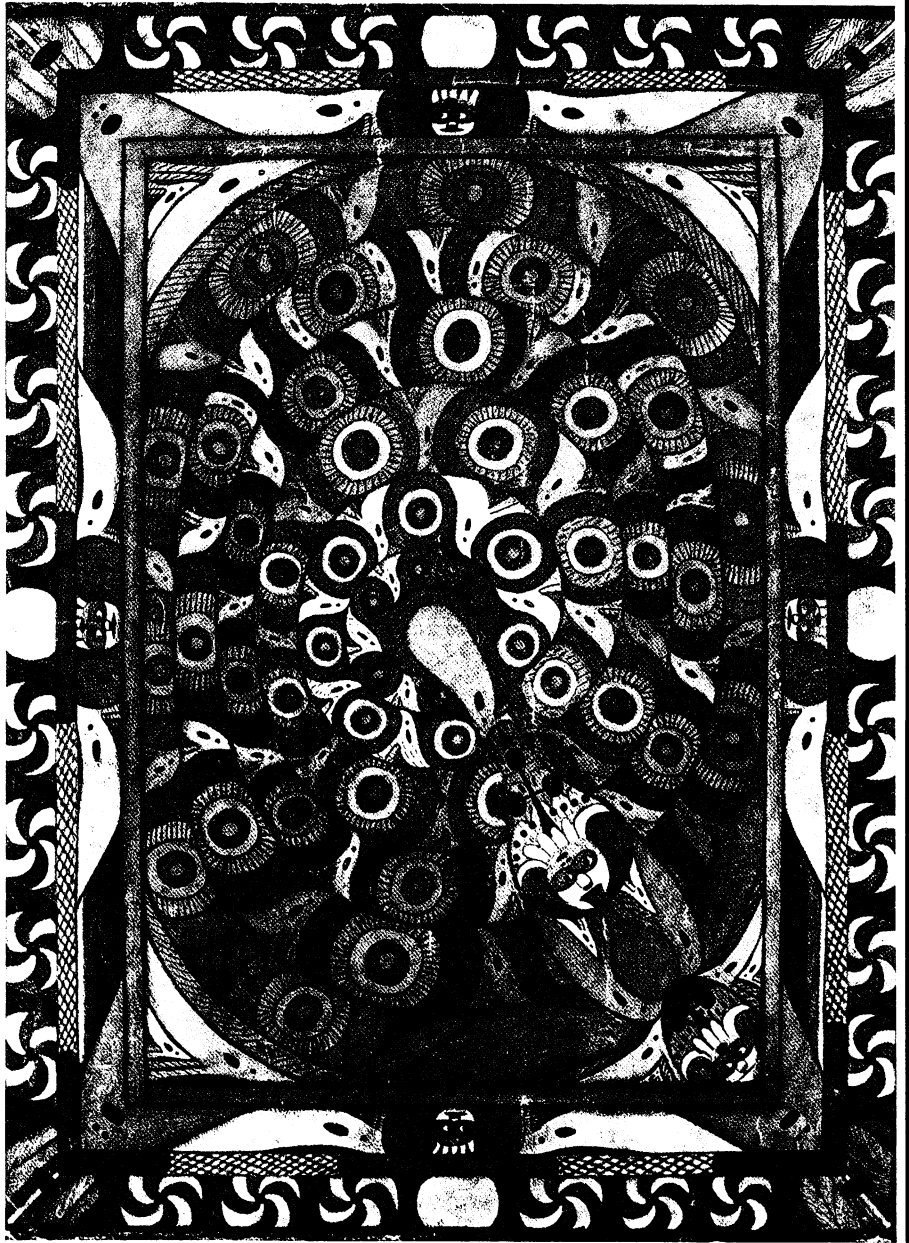
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## Music Psychopathology

### IV. The Course of Musical Expression during Music Therapy with Psychiatric Inpatients<sup>1</sup>

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**Abstract.** The music therapeutic productions of 67 psychiatric inpatients were analyzed concerning a systematic variation in the course of therapy. The impairment of performance was not as regular as with customary music, nevertheless with growing remission it was reversible in all diagnostic subgroups. The change for the better of rhythmic and motor skills of endogenous-depressed patients was seen to the same extent as with traditional music. The polarity profile developed for the assessment of music proved meaningful in the characterization of music therapeutic utterances.

Music therapy is widely used in psychiatry as a nonverbal therapeutic means in group activity [6, 15]. Although in many countries music therapy is taught at universities and schools, the scientific background to the theory has remained rather small [9]. The field is characterized by a large body of casuistic contributions based on psychoanalytic reflections [6, 12, 23]; some experiments dealing with vegetative reactions also give hints as to the physiological basis of the effects of music [5, 8, 22]. But a systematic examination of the musical 'language' in musical therapy, what the participants tell one another and how they do it, has never been

attempted. In a series of experiments Steinberg et al. [18-20] showed that musical expression changes in a systematic manner depending on the kind and the degree of mental disease, which allows us to speak of music psychopathology. No statistic difference was observed between the quality of musical expression of control persons of average musical ability and schizophrenic, manic, endogenous- and neurotic-depressed patients, when in a remitted state. When psychotic, the instrumental performances of schizophrenics were impaired in a dimension of musical logic and order, whereas endogenous-depressed patients showed a considerably weakened motoric quality in their playing. In this respect they could easily be dis-

<sup>1</sup> Dedicated to H. Hippus on his 65th birthday.

tinguished from neurotic-depressed patients, who showed only few systematic differences in their expressive capacities as did patients with manifold syndromes.

It was hypothesized that, depending on psychopathology, also with the elementary musical utterances in active music therapy, some systematic characteristics will be found as with customary music<sup>2</sup>.

## Method

The experiment was run with the usual set up of active music therapy in semiclosed groups. Inpatients suffering from schizophrenic, endogenous-depressive and manic psychosis formed one group, a second group consisted mainly of neurotic-depressed patients. Patients were classified according to ICD 9 criteria [2] at discharge. They were selected for music therapy with regard to their ability to attend a group. Patients with special musical skills were on the whole rejected, since 'musicians' often demand standards of traditional music in music therapy, which prevents them from integrating into those groups. On average each patient took part in 3.5 music therapy lessons within 6 weeks, which corresponds to the average inpatients' stay at the University Hospital.

As usual, music therapy began with the singing of familiar folk songs. Then the so-called 'drums game' was started. Each patient was supposed to express his feelings on a drum for about 0.5 min, then the group was expected to take over this musical picture by accompanying the soloist with the usual Orff percussion instruments [12]. A contact microphone was attached to the drum and recorded the playing on one channel of a tape recorder. The second channel contained the musical production of the group and was recorded with a room microphone. In this way the drumming could also be separated easily during the group improvisation. The latter lasted for about 2 min, then the next patient started as a soloist. With-

out any exception all patients agreed to the recordings, which lasted through the whole therapeutic lesson. It seemed that the recordings did not change the therapeutic situation by e.g. the induction of stage fright. After the drums game the lessons were confined to the usual elements of music therapy. About 1 h before and immediately after music therapy patients had to fill in the BfS self-rating scale [24]. A brief questionnaire [21] asked about the patient's satisfaction with the lesson. By means of the Brief Psychiatric Rating Scale (BPRS) [14], the psychopathologic state was assessed by the psychiatrist in attendance, who did not participate in music therapy.

The recordings of solo parts were selected and rated by means of a semantic differential [13] described in part II [19]. The rating was carried out by 3 musically trained physicians, who did not know about the psychopathologic state of the patients at the recordings. Metronome tempo (MM) of each sample was determined in beats per minute by adjustment of a mechanical metronome clock to the loudspeaker by independent raters. Average tempo was taken for data processing when the two ratings did not differ more than 10%. Otherwise the sample was rejected from analysis.

## Results

30 male (mean age  $25.9 \pm 6.7$  years) and 37 female ( $32.4 \pm 12.1$  years) patients were selected for the statistics. Apart from the group of endogenous-depressed patients, the gender relation was balanced, as seen in table 2, which shows follow-up data for 43 patients. Only 6 out of 67 patients had experience with musical instruments. Therefore no specific musical skills had to be considered, as it was quite important with the patients analyzed for customary musical abilities as described in part III [20].

### *Polarity Profile*

With the recordings of each patient's first therapeutic lesson the interrater reliability and the retest stability in assessing musical

<sup>2</sup> The term 'customary music' is used in contrast to the musical productions in music therapy. The terms 'traditional' as well as 'true' or 'conventional music' cover the meaning as well.

**Table 1.** Polarity profile

	A	B	C	D	E	F	G	H	
1 Flowing, spirited, lively	0.93	0.83	0.93	0.85	-0.03		-0.27	<0.05	hesitant, rigid, timid
2 Firm, stable, clear, exact	0.90	0.73	0.92	0.83	0.25	<0.05	-0.09		vague, fluctuating, indistinct, amorphous
3 Fine, precise, tender, sensitive	0.92	0.79	0.83	0.67	0.11		-0.01		coarse, unprecise, robust, insensitive
4 Rhythmic	0.96	0.88	0.92	0.83	0.34	<0.01	-0.13		unrhythmical
5 Peaceful	0.95	0.86	0.79	0.60	0.09		0.32	<0.01	aggressive
6 With feeling, intense, full of tension	0.88	0.69	0.91	0.82	0.04		-0.13		expressionless, boring, trivial
7 Expressive, subtle	0.82	0.57	0.90	0.80	0.08		-0.19		expressionless, undifferentiated
8 Professional	0.95	0.86	0.91	0.82	0.15		-0.22	<0.05	amateur
9 Logical, orderly, uniform	0.92	0.79	0.87	0.74	0.34	<0.01	-0.05		contradictory, incidental, disintegrating
10 Serious, profound	0.91	0.76	0.82	0.64	0.08		0.17		playful, superficial
11 Bold, expressive	0.92	0.79	0.92	0.83	0.02		-0.29	<0.01	cautious, timid

A = Correlation coefficients  $r_{tt}$  of the individual test-retest results of 20 samples as assessed by 3 experts; B = lower limits of confidence  $r_{(tt)}$  of the values of A; C = correlation coefficients  $r_{tt}$  between the means of 10 art music samples assessed by 3 experts in test-retest procedure [16]; D = lower confidence limits of  $r_{(tt)}$  of the values in C; E = correlation coefficients  $r$  between the assessments of music therapeutic samples and their tempo ( $n = 67$ ); F = probability  $p$  of the values in E (t test, two-tailed); G = correlation coefficients  $r$  of the assessments of 90 art music samples and their tempo [16]; H = probability  $p$  of the values in G.

characteristics were tested, as is described in more detail in part II [19]. Table 1 shows the polarity profile. An assessment of melodic qualities, which was included in the original, was omitted, since drumming does not have many varied melodic aspects. Statistics revealed a high interrater reliability in the assessments of the musical productions. Retest stability was tested with 20 samples after 1 year. Only in polarity (pol.) 7 did the raters not agree, which means that the recordings were not sufficiently described by a dimension of subtle differentiating quality. Coefficients for reliability  $r_{tt}$  and limits of confidence  $r_{(tt)}$  for the drum samples (table 1A, B)

and for the traditional music samples (table 1C, D) [16, 19] were listed. With the exception of pol. 7 all polarities showed a sufficient reliability, which proved that the polarity profile could be used for the aims of this study. In contrast to the results with conventional music pol. 5 peaceful-aggressive proved meaningful, while qualities of feeling, intensity and expression (pol. 6) were not understood to a greater extent. This underlines the considerable difference in emotions conveyed between musical pieces and poor rhythms. As is indicated in figure 1, the means of the 7-stage scale assessments of all diagnostic groups were found generally

Table 2. Follow-up data

	Schizophrenia 8M/7F 26.5 ± 5.5 years		Mania 5M/5F 29.5 ± 8.7 years		Endog. depression 6F 29.8 ± 7.4 years		Neurotic depression 5M/7F 26.7 ± 7.1 years	
	U <sub>1</sub>	U <sub>2</sub>	U <sub>1</sub>	U <sub>2</sub>	U <sub>1</sub>	U <sub>2</sub>	U <sub>1</sub>	U <sub>2</sub>
ANDP	12.20 ± 4.21	9.33* ± 3.08	8.70 ± 3.40	7.50 ± 3.65	13.85 ± 4.57	10.16 (*) ± 4.11	16.41 ± 2.57	11.16*** ± 2.91
ANER	12.86 ± 3.66	10.73* ± 3.47	6.80 ± 2.74	6.30 ± 2.00	9.66 ± 4.76	6.33 (*) ± 1.96	10.08 ± 3.50	7.41 ± 2.93
THOT	11.46 ± 5.01	7.13* ± 2.64	9.20 ± 3.52	4.60** ± 0.84	7.00 ± 2.36	4.16* ± 0.40	4.75 ± 1.42	4.25 ± 0.86
ACT	9.13 ± 2.69	6.33** ± 2.94	9.10 ± 3.38	4.90*** ± 1.96	7.83 ± 3.12	6.00 ± 2.52	7.16 ± 3.12	4.41** ± 1.83
HOST	6.93 ± 3.01	5.60* ± 3.39	5.20 ± 2.78	3.30* ± 0.94	5.33 ± 3.14	3.16* ± 0.40	4.83 ± 1.94	3.83 (*) ± 1.02
BPRS	52.60 ± 8.87	39.80*** ± 10.39	39.00 ± 10.82	26.60** ± 5.58	43.66 ± 8.01	29.83* ± 7.41	43.25 ± 7.46	31.08*** ± 4.27
BfS	25.26 ± 9.54	19.40 (*) ± 10.19	15.30 ± 10.35	13.40 ± 9.26	24.66 ± 14.17	19.00 ± 15.43	34.58 ± 15.94	31.91 ± 13.31

Psychopathology of 43 patients, assessed with the BPRS and a self-rating scale (BfS) at U<sub>1</sub> and U<sub>2</sub>. Values are means ± SD.

BPRS factors: Anxiety/Depression (ANDP), Anergia (ANER), Thought Disorders (THOT), Activity (ACT), Hostility (HOST).

Student's two-tailed t test for dependent samples. (\*) p ≤ 0.10; \* p ≤ 0.05; \*\* p ≤ 0.01; \*\*\* p ≤ 0.001.

around the arithmetic mean. Standard deviations ranged from 0.76 to 1.48, which indicates a fairly good differentiating quality of the profile.

### Tempo

The assumption of a correlation of rhythmic performance abilities and the age showed itself to be wrong as did the correlation between age and tempo. A minimal gender difference seemed to exist in the remitted state, showing slightly better results in all polarities with men than with women, reach-

ing significance in pol. 8 with  $3.19 \pm 0.95$  and  $4.7 \pm 1.32$  ( $p < 0.05$ ) respectively. A rather unexpected correlation was seen between tempo in music therapy and 3 polarities. As is shown in table 1E, F, with a faster tempo the impression of growing ambiguity, vagueness, unrhythmicity and inconsistency was conveyed. This is in contrast to results with customary music, in which faster tempo correlated significantly in a positive manner with pol. 5 and negatively with pol. 1, 8 and 11 (table 1G, H), [16, 18]. The faster this sort of music was played, the more

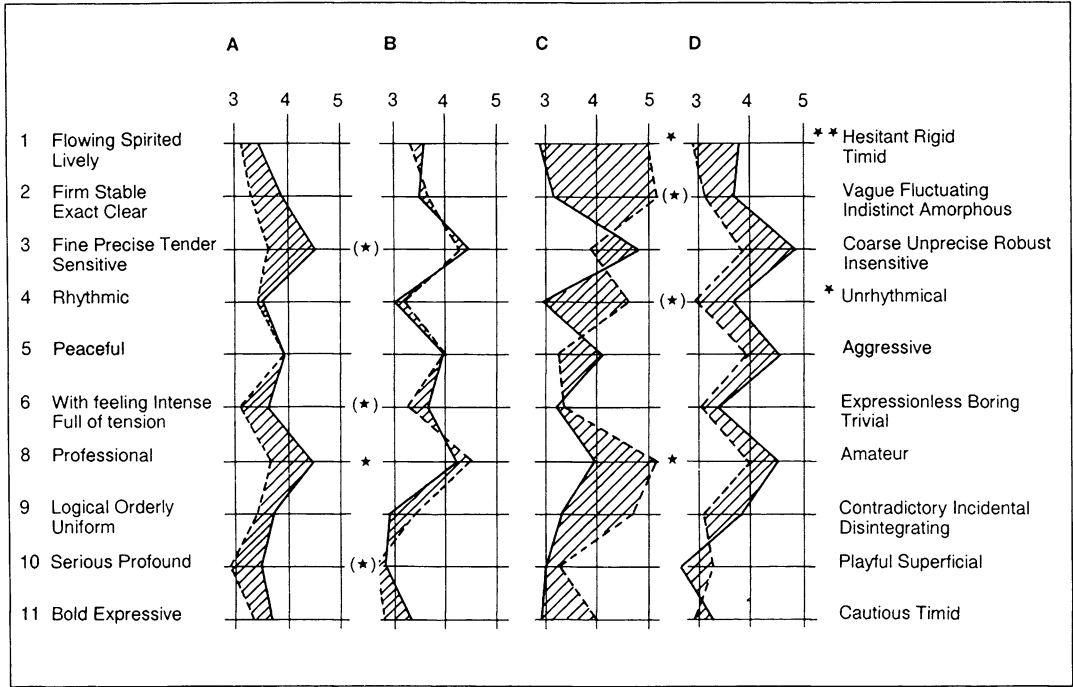


Fig. 1. A Polarity profiles of 15 schizophrenic patients. means at  $U_1$  (---) and  $U_2$  (—). B Polarity profiles of 10 manic patients. C Polarity profiles of 6 endogenous-depressed patients. D Polarity profiles of 15 neurotic-depressed patients. Student's two-tailed t test for dependent samples. (\*)  $p \leq 0.10$ ; \*  $p \leq 0.05$ ; \*\*  $p \leq 0.01$ .

fluent, aggressive, professional and bold it was found to be. A simple and clear explanation is not immediately evident. Obviously poor musical rhythms played by unskilled people lose the rather strong correlation between musical tempo and the impression of competence and professionalism when playing traditional music [1, 11, 17].

*Polarity Profile and Psychopathology*

With the whole sample of 67 patients the BPRS factors and the data of the polarity profile were correlated at  $U_1$ , the day on which the patients had the severest psychopathologic symptomatology. With an average BPRS of  $42.3 \pm 10.9$  the sample proved

fairly ill. Pol. 5 correlated negatively (-0.25) with anergia. BFS data correlated with pol. 2 (0.25) and 11 (0.30). This means that the objective as well as the subjective symptomatology of block of impulse is expressed significantly ( $p < 0.05$ ) by the rhythms played. With the diagnostic subgroups of manic and neurotic-depressive patients no correlation between psychopathology and musical expression was seen. With schizophrenics pol. 8 showed a significant correlation with BFS scores ( $r = 0.48$ ). The worse the patients felt the more contradictorily their playing was assessed. With 13 endogenous-depressed patients, anxiety/depression correlated significantly with pol. 6, 8 and 11 at  $U_1$ . Also

anergia and the BPRS score showed a significant correlation with pol. 6. The more depressed and blocked in impulse the patients were rated the more expressionless, amateur and timid their playing became. Also a positive correlation (0.57) between thought disorders and pol. 9 was found for endogenous-depressed patients, which underlines the impression of ambiguity. At  $U_2$ , the time the patients were at least partly remitted, no correlation between the objective psychopathologic symptoms of BPRS and musical expression resulted.

#### *Follow-Up*

With 43 patients a follow-up study over the whole course of music therapy was carried out. As is shown in table 2 an amelioration of the mental state resulted at  $U_2$ . In figure 1 the means of the  $U_1$  and the  $U_2$  assessments of musical productions of the subgroups are shown. Surprisingly schizophrenic patients played 'worse' at  $U_2$ , as did neurotic-depressed patients. With schizophrenics the raters experienced a significantly more amateur playing and a tendency to coarser, more boring and more superficial expression. Neurotic-depressed patients played at  $U_2$  significantly more timidly and unrhythmically. This is in strange contrast to results with artistic music [20], in which an amelioration in psychopathology generally was accompanied by a 'better' performance of the music pieces. Although psychopathology in manic patients changed considerably, no real change in the characteristics of their musical expression could be detected.

Completely inverse are the results with endogenous-depressed patients, who achieved much better results in most musical dimensions at  $U_2$ . Mainly within the polarities, which describe motoric skills and qualities

of impulsion and liveliness as pol. 1, 2, 4 and 8, endogenous-depressed patients differ most from the others. These are the same results as with traditional music, in which a considerable change in musical expression took place within these motor skills. Endogenous-depressed patients also differed from the other groups significantly at  $U_1$ , which resulted in ANOVA for pol. 1, 2, 8 and 11.

The music samples were analysed for the tempo variation at  $U_1$  and  $U_2$ . BPRS data are quite comparable to those shown in table 2. Despite the significant improvement in psychopathology, no important difference resulted in musical tempo for schizophrenics ( $U_1$ : MM  $98.6 \pm 28.9$ / $U_2$ : MM  $94.6 \pm 26.6$ ), endogenous-depressed patients (MM  $87.9 \pm 22.6$ /MM  $81.8 \pm 22.6$ ) and neurotic depressed patients (MM  $68.9 \pm 14.4$ /MM  $78.5 \pm 25.2$ ). Manic patients played considerably more slowly in the remitted state (MM  $78.9 \pm 19$ /MM  $64.5 \pm 9$ ;  $p < 0.05$ ). These results agree with the tempo study [part I, 18] using the children's song 'Hänschen klein' only in respect to schizophrenics and manics. Although the results with the two depressed groups do not comply with statistic significance, an inverse tempo relation resulted in comparison with the folk song tempo.

There was no impression that the scientific demand of the experiment very much influenced the therapeutic situation and the aims of music therapy. Taking the significant change in before/after lesson BfS data into consideration, the first lesson for each patient had a significant influence on their condition. With all diagnostic subgroups clear improvements in self-ratings resulted after the lesson. Both genders reacted in the same way. In the course of music therapy the effect vanished in all subgroups except for neurotic-depressed patients. Here a before/



after lesson difference of more than 10 points ( $p < 0.05$ ) resulted, which may be connected with their growing acceptance of music therapy, which is discussed in more detail elsewhere [7, 21]. Generally the questionnaire showed that the vast majority of participants appreciated music therapy, as evinced by the very low drop-out rate of 2 patients.

### Discussion

Quite ordinary music therapy lessons proved to be a scientific topic without a considerable reduction in therapeutic aspects. Although the contribution of music therapy to the remission of any mental disease is difficult to define in respect to the general treatment, high acceptance probably will correlate with a therapeutic effect [6]. The aim of this study was a definition of the musical language used in a music therapeutic situation. Inevitably, the experimental procedure accepts a considerable reduction of available information, since only the real musical aspects of the music therapeutic 'conversation', as represented by the recordings, were considered. Nonverbal aspects of group dynamics as e.g. the expression in one's eyes, facial expression or gestures are disregarded. But in this respect the experimental condition is comparable to the experiments with art music [18–20]. Nevertheless the general difference between the two musical languages is to be emphasized. Customary music is characterized by technical skills, stylistic peculiarities of melody and harmony, a defined musical message. Also a very definite rhythm and tempo contributes to the ideally typical 'Gestalt', which is intended by the composer, the interpreter and

the audience with rather limited variations. In contrast music therapeutic utterances do not really need musical experience or instrumental formation, often they can't be regarded as improvisations in the usual sense either. Nevertheless, even very amateur people feel invited to produce 'music', which means a fairly rhythmic sequence of beats and sounds. These low expert demands allow for broad application in therapies, but lowers e.g. the customary strong relation between tempo and competence as seen in true music [1, 11, 16, 18].

Nevertheless, many criteria of music are also useful in the evaluation of music therapeutic utterances. With the polarity profile originally developed for the description and definition of customary music, a high inter-rater reliability and retest stability was achieved in music therapeutic musics which together with the good differentiating abilities may allow the assumption of validity. This also means that the surprising course of musical language with remitting schizophrenics and neurotics will not be explained very easily. At  $U_2$  neurotic-depressives played more hesitantly, timidly, unrhythmically. The playing of schizophrenics appeared more amateurish, a tendency to insensitivity, boredom and superficiality resulted, although a significant amelioration in psychopathology was obvious. It seems rather unlikely that mainly side effects of the psychotropic medication are mirrored, since attention was paid to parkinsonism. Patients with a considerable rigor or tremor did not participate in the lessons. Otherwise the results with the neurotic-depressives are not at all explicable with medication side effects [18], since they did not receive neuroleptics and rather small doses of antidepressants in comparison with endogenous-depressed pa-

tients. There was not at all the impression that the patients had lost all interest in music therapy. Even though the self-ratings with schizophrenics did not show a considerable difference at  $U_2$ , they accepted music therapy as did neurotic-depressives, who even showed a significant difference in BfS data at  $U_2$ , which can be interpreted as high acceptance. It cannot be excluded that with growing relation to reality, self-confidence in musical production of schizophrenics diminished. But with neurotic-depressed patients this assumption will not hold, since no impression of grandiosity characterized psychopathology at  $U_1$ . It may be that the stimulus of novelty had vanished, since  $U_1$  for all patients had been the real first lesson. Another explanation – although speculative to some extent – could be that above all neurotic patients dared to play more freely, without restrictions and considerations of group conventions. This would also explain their high acceptance of the  $U_2$  lesson. Otherwise clear definitions of ‘better’ or ‘worse’ playing as in conventional music are not to be stressed in music therapy.

With growing remission manic patients showed no change in the assessment of their musical productions. The profiles are almost identical at  $U_1$  and  $U_2$ . In contrast to all other groups the tempo at  $U_2$  was significantly slower. This was not seen with customary music. Here very often fixed tempo prescriptions or at least individual conceptions of tempo performance exist, which are also found to be quite stable in folk songs [18]. In contrast, music therapeutic utterances lack a defined message, a performance task as well as tempo prescriptions. Although the average tempo of manic patients was not significantly elevated at  $U_1$ , the significant

drop in tempo at  $U_2$  is probably partly due to the remitted augmentation of impulsions.

With endogenous-depressed patients almost the same results were found as with traditional music [18–20]. That tempo did not rise with remission as in conventional music will be due to the more or less complete lack of obligatory rules in performing music therapy in comparison to a musical piece. Besides this, the same amelioration of the weakened motoricity was seen as in playing music. The performance was significantly more flowing, lively; it was also perceived as more professional. A tendency to more stable and clear expression and also more rhythmicity resulted. Also a clear correlation was found between the factors anergia, anxiety/depression and thought disorders with 3 dimensions of the polarity profile, which describe covarying musical qualities of expression, professionalism, contradiction and boldness. This was not found with neurotic-depressed patients as in the experiments with customary music. Although no further definition of this difference by e.g. tapping [18] could be exerted without changing the therapeutic situation completely, this outstanding motoric feature seems to differentiate between two forms of depression as has been presumed in European psychiatry for a long time [3, 4, 10].

The results reveal that the musical language of active music therapy conveys feelings, mood variations, disturbances in thought disorders and the weakness of lacking impulsions as does traditional music. Although the correlation between psychopathology and musical expression is not as strong as with the latter, the musical utterances in the therapies mirror the condition of the patients in a systematic manner as a music psychopathology. By exclusion of all

nonverbal parts of those music performances, the message is also quite understandable even from poor recordings.

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