Emotion Modulation in Psychiatric Patients Through Music

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This study explores differences in the use of music in everyday life among diagnostic groups of a psychiatric population (n = 180) in reference to a group of healthy subjects (n = 430). The results indicate that patients with mental disorders use music more for emotion modulation than healthy controls. In particular, patients with substance abuse and those with personality disorders used music mainly for cognitive problem solving and the reduction of negative activation, whereas patients with substance abuse in addition used music not often to stimulate themselves positively. Patients suffering from schizophrenia and personality disorders more often applied music for relaxation than the subjects of the reference group. Furthermore, the degree of severity of the psychiatric disorder correlated with the increased use of music for emotion modulation, i.e., for relaxation and cognitive problem solving. Thus, the results demonstrate an increased use of music for emotion modulation in patients with mental disorders in association with the severity of the disorder.

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Key words: use of music, emotion modulation, emotion regulation, mental disorders, diagnosis

The use of music (UofM) in everyday life is a field of growing interest, particularly due to its obvious role as an important suppressor or mediator variable with regard to existing affect and emotion, personality, and different behavior variables (e.g., health, coping, deviant behavior). First assumptions were made by Arnett (1991a, 1991b), who hypothesized that listening to heavy metal music may operate as a stress reducing coping strategy. DeNora (1999, 2000) concluded from her interviews that music is not only a coping strategy, but an active component influencing everyday life emotions, concentration/vigilance, and social processes. In the following years several studies evaluated the relevance of UofM in everyday life (e.g., Hays & Minichiello, 2005; Juslin & Laukka, 2004; North, Hargreaves, & Hargraves, 2004; Pickles 2003; Rentfrow & McDonald, 2010; Schäfer & Sedelmeier, 2009; Sloboda, 2010; Sloboda, O’Neill, & Ivaldi, 2001; Vorderer & Schramm, 2004).

Up to now, existing questionnaires comprise only instruments (Chamorro-Premuzic & Furnham, 2007; Saarikallio, 2008) focusing on a mainly passive reception of music in everyday life (Behne, 1986, 1997, 2009) that might nevertheless have the (active-like) quality of experience. However, in the strict sense, the term use of music in everyday life refers at least to the existence of a learned behavior or (active) action strategy that is applied consciously by individuals who use music to influence existing everyday states (e.g., positive or negative emotions, affects, arousal, concentration, vigilance, or processes of social attachment) (von Georgi, 2013).

On this theoretical basis, we constructed the IAAM (Inventory for the Measurement of Activation and Arousal Modulation), a questionnaire for the measurement of UofM with a high reliability (over .80 for all scales) and validity, including Rasch-scaling (von Georgi, 2007, 2013; von Georgi, Cimbal, & von Georgi 2009; von Georgi, Göbel, & Gebhardt, 2009). The items of the IAAM ask for the active and conscious use of music (e.g., I am listening to music, if I want to do, change, feel or remember something) and it consists of the following five scales (eleven items per scale): relaxation (RX: somatic and psychological relaxation through music), cognitive problem solving (CP: thinking about social and internal problems and affects, including memory aspects), reduction of negative activation (RA: modulation of a strong negative activation and emotional arousal), fun stimulation (FS: positive psychological and motoric activation and establishment of social relationships) and, finally, arousal modulation (AM: the modulation of concentration skills and general capability) (von Georgi, 2007; von Georgi, Grant, von Georgi, & Gebhardt 2006). These scales were integrated from the beginning into the neurophysiological personality model of Gray and McNaughton (2003), whereas...
relaxation and cognitive problem solving were connected with the behavioral inhibition system (negative affect and anxiety), reduction of negative activation with the fight-flight-freeze system (negative affect and active or passive avoidance behavior) and fun stimulation with the behavioral approach system (positive affect, approach behavior, sociability) (von Georgi, 2013; von Georgi et al. 2006). The arousal modulation scale was assigned to the glutamate-GABA-balance model of Carlsson et al. (2001) (von Georgi et al., 2006).

We use the term emotion modulation instead of emotion regulation or mood regulation in connection with UoFM and the IAAM-scales, because this term emphasizes the unfocused qualitative aspects of UoFM rather than the directed quantitative ones. This means, people use music more often for a qualitative modulation than for a simple intensification or attenuation of existing affects and emotions (regulation), so that UoFM is able to act as a substantial learned self-therapeutic intervention in psychological and physiological states of mental health according to the mediator hypothesis of Miranda, Gaudreau, Debrosse, Morizot, and Kirmayer (2012).

Unfortunately, music has been studied predominantly on a therapeutic basis in both mental (e.g., Gold, Solli, Krüger, & Lie 2009; Koger, Chapin, & Brotons 1999; Silverman, 2003) and physical diseases (e.g., Pacchetti et al., 2000), on general psychological effects (e.g., stress reduction; see Pelletier, 2004), or in conjunction with specific music preferences, such as Metal or Hip-Hop, and their connection to observed deviant behavior or psychological problems (see Miranda et al., 2012). However, with respect to psychiatric illnesses, almost no studies exist on the UoFM on individuals suffering from mental disorders. In a first pilot study, we could show that psychiatric patients generally exhibit higher values in relaxation, cognitive problem solving, and reduction of negative activation compared to non-psychiatric controls (Gebhardt & von Georgi, 2007).

The aim of the present explorative study was to extend the above mentioned findings by further evaluating possible differences of UoMF in individuals suffering from mental diseases.

We expected more insights into specific affect modulation strategies by the use of music in relation to the different psychiatric diagnostic groups or the healthy subjects, respectively, and to the different psychosocial functioning levels of the patients.

Method

STUDY SAMPLE

One hundred and eighty patients (103 females) of an average age of 34.6 years (SD = 18.9; range = 18-82), admitted consecutively to the Department of Psychiatry and Psychotherapy of the Philipps-University of Marburg/Germany, participated in the study. Recruitment of the psychiatric patients began in 2005 and ended in 2007. The rate of completed questionnaires returned was 61.0%. The reason for non-participation was lack of motivation, mainly due to impaired health. No patient of the study was treated with music therapy during the actual inpatient treatment. The participating patients were categorized according to the diagnostic groups of ICD-10 (Dilling, Mombour, & Schmidt, 2011) as shown in Table 1. Subjects of other ICD-10 diagnostic groups (mental retardation ICD-10 F7) and disorders of psychological development (ICD-10 F8) were not included in this sample. For statistical analysis the following diagnostic groups were removed from the original sample size (n = 189) because of their limited number: F0 (organic, including symptomatic, mental disorders; n = 3), F5 (behavioral syndromes associated with physiological disturbances and physical factors; n = 5), and F9 (behavioral and emotional disorders with onset usually occurring in childhood and adolescence; n = 1). Table 1 presents the remaining samples and their description (F1: mental and behavioral disorders due to use of psychoactive substances; F2: schizophrenia, schizotypal, and delusional disorders; F3: affective disorders; F4: neurotic, stress-related, and somatiform disorders; F6: disorders of personality and behavior in adult persons). The average global psychological and social functioning of all patients, which was assessed by the Global Assessment of Functioning Scale (GAF), was 56 (SD = 10; range = 25-88). The numeric scale for the GAF ranges from 1 (maximum symptoms) to 100 (no symptoms) as described in the DSM-IV-TR (American Psychiatric Association, 2000). The GAF value of all psychiatric groups ranged between 50 and 60 (Table 1), indicating that the patients showed moderate symptoms or social or occupational difficulties, respectively. Patients were asked whether they felt mentally healthy enough to take part in the study. If they answered in the affirmative, they were given a complete description of the study and written informed consent was obtained per experimental protocol approval by the Ethics Committee of the University of Marburg.

REFERENCE SAMPLE

The reference sample included 430 healthy individuals (219 female; mean age = 34.6 years; SD = 18.8; range = 12-80) pooled from different study samples: pupils aged 12-16 years (n = 94), first-semester students (n = 129), and older individuals recruited by chance from selected middle-class companies, insurance institutions, and club
associations (Lahn-Dill-Kreis, Kreis Gießen, Germany; \( n = 106 \)), as well as patients of a general practitioner (\( n = 101 \)) (see von Georgi, Steinbrück, Schütz, & Rein, 2008).

**QUESTIONNAIRES**

The IAAM, as described above, and further questions were included in this study (musical preference items: 16 forced choice categories on the background of the study of Rentfrow & Gosling, 2003, and questions about the UofM in connection with drug abuse). For all IAAM-scales Cronbach’s \( \alpha \) was above .89 (patients and healthy subjects, see Table 2). The questionnaires were distributed and collected by one of the authors (SG). The estimation of the global functioning level according to GAF was performed by the therapist who treated the patient.

**DATA ANALYSIS**

The data were analyzed using SPSS 18.0 (Statistical Package for the Social Sciences). Due to age effects (see results), IAAM-scales were corrected using the linear regression model to compute the unstandardized residuals from age on the IAAM-scales (actual value of the dependent variable minus the value predicted by the regression). Multivariate one-factor analyses of variance (MANOVA) of the unstandardized residuals, univariate one-factor variance analyses (ONEWAY), and Scheffé-post hoc tests were implemented to identify mean differences in the IAAM-scales among the diagnostic groups and the reference sample. To avoid, that the variances of the normal reference sample mask possible differences between the groups of mental disorders, the same analyses of variance was performed on the psychiatric sample excluding reference sample. To detect possible statistical differences between the IAAM-scales within each psychiatric group, the Hotellings \( T^2 \)-test was administered. The significance level was set at .05. Because of the exploratory nature of this study, empirical \( p \) values lower than .10 were also interpreted as an existing trend to control for beta error.

**Results**

**CONTROL VARIABLES: AGE, GENDER, AND MUSIC PREFERENCES**

The reference sample of von Georgi et al. (2008) has shown a strong mean decline of UofM measured by the IAAM-scales at ages ranging from 27 to 30 years. Simple correlation analyses showed comparable results (Table 2). The questionnaires were distributed and collected by one of the authors (SG). The estimation of the global functioning level according to GAF was performed by the therapist who treated the patient.

**TABLE 1. Description of the Patients.**

<table>
<thead>
<tr>
<th>Family status</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F6</th>
<th>total</th>
<th>RS</th>
</tr>
</thead>
<tbody>
<tr>
<td>married</td>
<td>2</td>
<td>6</td>
<td>27</td>
<td>14</td>
<td>5</td>
<td>54</td>
<td>–</td>
</tr>
<tr>
<td>single</td>
<td>5</td>
<td>13</td>
<td>24</td>
<td>28</td>
<td>23</td>
<td>93</td>
<td>–</td>
</tr>
<tr>
<td>divorced</td>
<td>4</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>18</td>
<td>–</td>
</tr>
<tr>
<td>widowed</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>2</td>
<td>10</td>
<td>–</td>
</tr>
<tr>
<td>Graduation</td>
<td>no</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>sec. gen. school</td>
<td>5</td>
<td>6</td>
<td>19</td>
<td>8</td>
<td>6</td>
<td>44</td>
<td>–</td>
</tr>
<tr>
<td>intermed. sec. school</td>
<td>4</td>
<td>7</td>
<td>13</td>
<td>16</td>
<td>12</td>
<td>52</td>
<td>–</td>
</tr>
<tr>
<td>grammar schools (A)</td>
<td>3</td>
<td>6</td>
<td>18</td>
<td>19</td>
<td>10</td>
<td>56</td>
<td>–</td>
</tr>
<tr>
<td>university</td>
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<td>3</td>
<td>14</td>
<td>3</td>
<td>4</td>
<td>24</td>
<td>–</td>
</tr>
<tr>
<td>Gender</td>
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<td>4</td>
<td>7</td>
<td>36</td>
<td>33</td>
<td>23</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>male</td>
<td>8</td>
<td>15</td>
<td>30</td>
<td>13</td>
<td>11</td>
<td>77</td>
</tr>
<tr>
<td>Age</td>
<td>( M )</td>
<td>40.33</td>
<td>37.18</td>
<td>41.85</td>
<td>32.98</td>
<td>33.62</td>
<td>37.42</td>
</tr>
<tr>
<td></td>
<td>( SD )</td>
<td>9.41</td>
<td>8.82</td>
<td>14.85</td>
<td>11.87</td>
<td>11.66</td>
<td>13.32</td>
</tr>
<tr>
<td></td>
<td>( Md )</td>
<td>42</td>
<td>38</td>
<td>43</td>
<td>29</td>
<td>34</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>( min )</td>
<td>24</td>
<td>51</td>
<td>19</td>
<td>19</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>( max )</td>
<td>52</td>
<td>82</td>
<td>66</td>
<td>62</td>
<td>82</td>
<td>80</td>
</tr>
<tr>
<td>GAF</td>
<td>( M )</td>
<td>50.53</td>
<td>53.68</td>
<td>54.46</td>
<td>59.76</td>
<td>58.00</td>
<td>56.12</td>
</tr>
<tr>
<td></td>
<td>( SD )</td>
<td>8.17</td>
<td>11.58</td>
<td>10.19</td>
<td>7.76</td>
<td>9.02</td>
<td>9.78</td>
</tr>
<tr>
<td></td>
<td>( N )</td>
<td>12</td>
<td>22</td>
<td>66</td>
<td>46</td>
<td>34</td>
<td>180</td>
</tr>
</tbody>
</table>

Note: \( F1 \): mental and behavioral disorders due to use of psychoactive substances; \( F2 \): schizophrenia, schizotypal and delusional disorders; \( F3 \): affective disorders; \( F4 \): neurotic, stress-related and somatoform disorders; \( F6 \): disorders of personality and behavior in adult persons; \( RS \): Reference sample; GAF: Global Assessment of Functioning Scale (American Psychiatric Association, 2000).
significant \((p < .001)\), the results indicated the best fit for linear regression functions that were used for computing the residuals of the IAAM-scales (see chapter data analyses). The possible impact of gender was tested by using the \(t\)-test. No gender differences with respect to the IAAM-scales could be detected in either the psychiatric group or in the reference group. Considering musical preferences, the chi-square test of the frequency of the four musical preference groups established by Rentfrow and Gosling (2003) resulted in no significant differences between the study sample and the reference sample, \(\chi^2 < 5.36; df = 3; p > .13\).

RESULTS ON THE CORRELATION ANALYSIS
The correlation analysis between the GAF and the IAAM-scales resulted in a significant effect for relaxation, \(r = -.23, p = .003\), and cognitive problem solving, \(r = -.17, p = .03\), and in trends towards significance for reduction of negative activation, \(r = -.13, p = .09\), and arousal modulation, \(r = -.14, p = .08\). However, we found no correlation between fun stimulation and the GAF score.

RESULTS ON THE VARIANCE ANALYSES AND THE \(T^2\)-TEST
Table 3 shows the results of the variance analyses (MANOVA, ONEWAY) and the \(T^2\)-test. It can be seen that in the case of all multivariate variance analyses (with or without reference group and unstandardized residuals or original data), \(p\) values are clearly below .05. Significant differences, including the reference group, were found for the IAAM-scales relaxation, cognitive problem solving, and reduction of negative activation. In the case of the within-analyses, only the scale cognitive problem solving reaches significance.

Figure 1 shows the mean values of the calculated unstandardized residuals by presenting the differences between the reference group for better interpretation (the zero line in Figure 1 represents the means of the reference group). It can be shown that there were no differences with respect to arousal modulation and no significant one-way ANOVA results were obtained for fun stimulation. But it can be seen that the F1-group (mental and behavioral disorders based on psychoactive substance use) shows a strong tendency to reject UoFM for a positive stimulation in everyday life.
According to the significant MANOVA results, it can also be seen that relaxation is increased in all groups compared to the reference group. Only the F4-group (neurotic, stress-related, and somatoform disorders) seems to be close to the reference sample. Cognitive problem solving and a reduction of negative activation by music do markedly incline within the F1- and F6-group (disorders of adult personality and behavior). The Scheffé procedure reveals significant results or trends compared to the reference sample for relaxation within the F2-group (schizophrenia, schizotypal and delusional disorders; \( p = 0.028 \)) and for relaxation (trend; \( p = 0.051 \)), cognitive problem solving (\( p = 0.004 \)), and reduction of negative activation (trend; \( p = 0.068 \)) within the F6-group. The additional \( T^2 \)-Hotelling test shows that the IAAM-scales significantly differ within these three groups (F1: \( p = 0.08 \); F3: \( p = 0.01 \); F6: \( p = 0.001 \)) (see Table 3).

### Discussion

**The Impact of Affect Modulation by Music on Psychiatric Patients**

The results of the present study suggest that patients with mental disorders use music more for the modulation of emotional processes than the healthy control subjects investigated cross-sectionally. In particular, the lower the general functioning level of the patients is, the more they use music for relaxation and cognitive problem solving to modulate negative affects. Both forms of UoM are theoretically connected with the behavioral inhibition system, which goes along with the emotion of anxiety (von Georgi, 2013; von Georgi et al., 2006). Because no correlation was found for a positive stimulation by music in the patients, this result strengthens the assumption that a higher emotional activation that may also be caused by psychological, social, or occupational problems goes along with the UoM for active cognitive and/or body-mind orientated modulation of negative emotions.

**The Impact of Different Diagnostic Groups**

Figure 1 shows that patients with schizophrenia, schizotypal and delusional disorders (ICD-10 F2), and affective disorders (ICD-10 F3) do have a visible tendency to use music especially for body-mind orientated relaxation and a relatively low tendency to use music for cognitive problem solving. In conjunction with the result of the very high use of music for cognitive problem solving in the groups of patients with substance abuse and disorders of adult personality and behavior, it may be hypothesized that schizophrenic and depressive patients neglect using a cognitive emotion modulation because of their specific mental symptoms of distorted thinking and negative or unrealistic interpretation of their self and their environment (Braff & Beck, 1974; Gebhardt, Grant, von Georgi, & Huber, 2008). From a therapeutic point of view, these patients may learn new cognitive patterns of how to...

### Table 3. Results of the Statistical Analyses.

<table>
<thead>
<tr>
<th>sample</th>
<th>analysis</th>
<th>scale</th>
<th>Pillai's-trace</th>
<th>F- or ( T^2 )-value</th>
<th>df</th>
<th>p(ures)</th>
<th>p(org)</th>
</tr>
</thead>
<tbody>
<tr>
<td>with reference sample</td>
<td>MANOVA</td>
<td>RX</td>
<td>0.06</td>
<td>6.94</td>
<td>5; 522</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>ONEWAY</td>
<td>RX</td>
<td>0.06</td>
<td>5.84</td>
<td>5</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CP</td>
<td>0.06</td>
<td>4.80</td>
<td>5</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RA</td>
<td>0.06</td>
<td>3.77</td>
<td>5</td>
<td>&lt; .002</td>
<td>&lt; .015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FS</td>
<td>0.06</td>
<td>1.16</td>
<td>5</td>
<td>&lt; .326</td>
<td>&lt; .195</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AM</td>
<td>0.06</td>
<td>0.85</td>
<td>5</td>
<td>&lt; .515</td>
<td>&lt; .581</td>
</tr>
<tr>
<td>without reference sample</td>
<td>MANOVA</td>
<td>RX</td>
<td>0.22</td>
<td>6.44</td>
<td>4; 114</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>ONEWAY</td>
<td>RX</td>
<td>0.22</td>
<td>0.83</td>
<td>4</td>
<td>&lt; .506</td>
<td>&lt; .620</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CP</td>
<td>0.22</td>
<td>2.60</td>
<td>4</td>
<td>&lt; .040</td>
<td>&lt; .025</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RA</td>
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<td>1.64</td>
<td>4</td>
<td>&lt; .169</td>
<td>&lt; .252</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FS</td>
<td>0.22</td>
<td>1.14</td>
<td>4</td>
<td>&lt; .341</td>
<td>&lt; .198</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AM</td>
<td>0.22</td>
<td>0.92</td>
<td>4</td>
<td>&lt; .457</td>
<td>&lt; .481</td>
</tr>
<tr>
<td></td>
<td>( T^2 )-Hotelling</td>
<td>F1</td>
<td>0.22</td>
<td>11.79</td>
<td>4; 2</td>
<td>&lt; .080</td>
<td>&lt; .189</td>
</tr>
<tr>
<td></td>
<td>(within analysis)</td>
<td>F2</td>
<td>0.22</td>
<td>1.49</td>
<td>4; 9</td>
<td>&lt; .285</td>
<td>&lt; .014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F3</td>
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<td>3.85</td>
<td>4; 40</td>
<td>&lt; .010</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F4</td>
<td>0.22</td>
<td>1.66</td>
<td>4; 29</td>
<td>&lt; .185</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F6</td>
<td>0.22</td>
<td>7.51</td>
<td>4; 23</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

Note: df: degrees of freedom; p(ures): resulting p-value of the given analyses based on corrected data by age (unstandardized residuals); p(org): resulting p-value based on original data; MANOVA: multivariate analysis of variance; ONEWAY: one factor analysis of variance; RX: relaxation; CP: cognitive problem solving; RA: reduction of negative activation; FS: fun stimulation; AM: arousal modulation; F1: mental and behavioral disorders due to use of psychoactive substances; F2: schizophrenia, schizotypal and delusional disorders; F3: affective disorders; F4: neurotic, stress-related and somatoform disorders; F6: disorders of personality and behavior in adult persons.
think about themselves and their environment by restructuring their cognitive thinking with the help of music.

The highest values of the UofM for modulating negative emotions could be shown among the groups of patients with drug abuse and patients with disorders of adult personality and behavior. Especially the group of patients with drug abuse is characterized by a strong negation of positive stimulation by music.

The crucial role of functional or maladaptive regulation strategies of high affective activation levels in patients with borderline personality is well known (e.g., Niedtfeld et al., 2010). Therefore, the UofM is a comparable functional skill to cope with such emotional tension states. As an indication for the accuracy of this interpretation, the high mean value of the use of music for reduction of negative emotional strain within this group should be taken into account. The items of this IAAM-scale clearly ask for a passive or active avoidance behavior that may be assigned to a highly activated fight-flight-freezing system (e.g., I want to let off steam, I am aggressive, I want to let out all the anger that is inside me, I think that I could hurt people at the moment).

CLASSIFICATION OF THE USE OF MUSIC IN PSYCHIATRIC DISORDERS
We cannot actually distinguish whether the altered UofM behavior represents a patho-mechanism in the development of mental disorders in the sense of a dysfunctional behavior, a symptom, an epiphenomenon, or an active emotion orientated strategy. The present data might mirror both: impaired skills as well as self-therapeutic mechanisms. The lack of using music for fun seeking in depressive or personality disorders might be

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FIGURE 1. Mean differences of the IAAM-scales. Bars represent the differences between unstandardized residuals and the reference sample (zero line). RX: relaxation; CP: cognitive problem solving; RA: reduction of negative activation; FS: fun stimulation; AM: arousal modulation.
the result of an extensive use of music for modulating reduction of negative affects in order to overcome strong negative emotions. However, emotion modulation and dysfunctional behavior as well as pathogenesis might sometimes be mixed. To clarify these possible effects, a longitudinal study would be useful, as would a questionnaire study in which the patients were asked about their UofM before and during their time of acute illness.

LIMITATIONS AND STRENGTHS

Limitations of this study include the cross-sectional design (instead of a prospective or longitudinal controlled design) and the varying sizes of the diagnostic groups. Furthermore, the effects of medication on concentration or responses to emotional items in the psychiatric sample cannot be excluded. Moreover, we did not test possible mood changes induced by filling out the questionnaires, which might be harder for patients than for non-patients. However, the IAAM is a short instrument and we did not receive negative feedback from the patients.

The dose-effect relationship, concerning the time spent listening to music (duration and loudness), has not been assessed in the reference sample, so that no differences between patients and controls could be tested. However, we found, that there was no dose-effect relationship within the study sample (e.g., among different diagnostic groups).

In order to assess exclusively the everyday use of music by the patients themselves, no music listening tests were performed in this study, so that the study is based on a patients’ report basis. Altogether, our study represents an investigation of the UofM in everyday life among psychiatric patients under real-world conditions.

Conclusion

To our knowledge, the present study and our pilot study are the first quantitative empirical studies published on the use of music for emotion modulation in patients with psychiatric disorders, although the methodological basis is still of an exploratory nature. Patients with mental disorders show an increased use of music compared to healthy controls, which is also connected with their psychosocial functional level. Thus, music plays a crucial role in the everyday life of patients suffering from psychiatric disorders, and may be used by them as a “therapeutic self-medication.” Besides theoretical and therapeutic aspects, this result may have high clinical relevance: The use of music may also impact the emotional state of the patients so that an interaction with existing therapeutic interventions, such as psychotherapy or psychopharmacological treatment, is possible. In this case, learned strategies of the use of music and their active application may alter the therapeutic outcome in a positive or negative way.

Author Note

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