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The role of subjectively perceived musicality on emotion modulation in mental disorders

Stefan Gebhardt[1]* and Richard von Georgi[2]

[1]Department of Psychiatry and Psychotherapy, Philipps-University Marburg, Germany

[2]SRH University of Popular Arts, Berlin, Germany

Abstract

Background: Until now little has been known about the role of musicality for emotion modulation through music in patients with mental disorders. Objective: To explore differences between patients who call themselves musical (M group) and those who call themselves unmusical (U group).

Methods: A population (n=181) of inpatients of a psychiatric hospital without music therapy was examined using one inventory on emotion modulation by music in the everyday live (IAAM) and another assessing personality dimensions (SKI). Furthermore, variables on the use of music in everyday life were assessed.

Results: Patients of the U and M group did not differ in gender, age and the global functioning as measured by the GAF (global assessment of functioning) score. Compared to the U group, patients of the M group described themselves as more attractive which might indicate a better self-esteem, used music more for relaxation and for reduction of negative activation. Furthermore, patients of the M group did not stop listening after onset of the mental disorder, felt that the music helped them and have listened to music more in the foreground.

Conclusion: The study indicates that patients who perceive themselves as musical individuals, experience themselves more favorable in their self-image and use music more for relaxation and to reduce negative affectivity. In addition, they do not abandon such emotion modulation strategies when they become ill with a mental disorder, suggesting a higher level of self-efficacy, which in turn should be helpful for therapeutic success.

Introduction

Music is a communication medium with a strong emotional influence on the human being. The individual's behavior towards music develops especially during childhood, youth and adolescence [1], accompanying and interacting with the process of socialization and the development of personality traits [2]. There are neurological and hormonal findings indicating that biological differences between musicians and non-musicians are already developing prenatal, particularly with regard to creative musical abilities, e.g. composition and improvisation, which in turn has an impact on personality development [3,4]. In childhood, musicality develops with intensive involvement with music and can stabilize at the age of ten years in the form of musical talent. Musicians who started learning an instrument before the age of seven were able to visualize an enlargement of the frontal area of the corpus callosum in magnetic resonance imaging [5]. Singer [6] and other neurophysiologists suggest that until adolescence, a large number of synaptic connections are made in the brain, of which only those compounds that are activated by exercise and training before puberty are preserved. Musicality is present in nearly the total general population, while the phenomenon known as congenital amusia is present in about 4% of the population [7].

Since music, emotion modulation strategies and personality development are thus closely linked, the question arises as to what role musicality has in people with mental illness, who often have a deficit in the processing of emotions. To investigate this further, the research paradigm "The Use of Music in Everyday Live" (UofM) was used. The term UofM refers to the existence of a learned behavior or active action strategy which 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) [8,9]. In the everyday life of patients with mental disorders the UofM often has a crucial role for both the modulation of affect (e.g., in borderline patients as a substitute for non-suicidal self-harming behavior [10]), and for the cognitive processing and transformation of dysfunctional schemata with the help of music therapy [11]. In previous reports we could show that patients with mental disorders use music in order to reduce negative emotions [9,12]. Thereby the UofM was positively correlated with the severity of the disorder. Thus, considering that music is ubiquitous, the research on the UofM certainly has a strong impact on public health.

The aim of the current investigation was to explore the differences between patients who see themselves as musical, of whom patients describing themselves as unmusical in terms of their emotion modulation strategies through music, their personality, and their handling of music in the context of the disease.

Methods

Subjects

Of n=312 asked patients n=190 patients (61%; 111 females and 79 males; mean age 37.4 ± 13.3 years, range 18-82 years) admitted at

Correspondence to: Gebhardt S, Department of Psychiatry and Psychotherapy, Philipps-University Marburg, Germany, E-mail: Stefan.Gebhardt@uni-marburg.de

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a clinic for psychiatry and psychotherapy, participated in the study carried out in 2005 until 2007. No patient of the study was treated with music therapy during the actual inpatient treatment. Only 2 patients were professional musicians; they were in the M group. The patients suffered from mood affective disorders (36.4%), neurotic disorders (24.2%), disorders of adult personality and behavior (17.9%), schizophrenia spectrum disorders (12.2%), psychoactive substance use (6.3%), and others. Gender and age within the study group did not correlate significantly. Patients gave written informed consent; the study was approved by the Ethics Committee of the University of Marburg, Germany. The sample was made up of patients answering the question of musicality. In this case, n = 97 described themselves as musical (M group) and n = 84 as unmusical (U group), so that a total of n = 181 patients was examined more closely.

Assessment and instruments

Patients received self-assessment questionnaires. The "Inventory for the assessment of Activation and Arousal modulation through Music" (IAAM) with 62 items on a 5-point-scale showing high reliability and validity [9,13-17] measured the situation-dependent everyday life UofM according to the parameters Relaxation, Cognitive Problem Solving, Reduction of negative Activation, Fun Seeking and Arousal Modulation. Personality dimensions were assessed by means of the self-concept inventory (SKI [18]). The SKI is designed to register that part of the personality which results mainly from interpersonal interaction. The 5 scales, each containing 8 bipolar items on a 7-point-scale, cover the following dimensions with sufficient reliability coefficients (Cronbach's Alpha) in the present sample: ego-strength vs. insecurity (sense of personal and existential security together with the lack of feelings of anxiety; α= 0.79), attractiveness vs. marginality (self-assessment of own worth in social groups; α=0.90), confidence vs. reserve (attachment capacity and intimacy; α=0.85), orderliness vs. insouciance (degree of structuring in personal environment; α=0.78) and enforcement vs. cooperation (self-assessment of assertiveness in social groups; α=0.74). Another short questionnaire gathered data on subjective impressions on emotion modulation by UofM before and after onset of the mental disorder. One item of it asked for subjective musicality; this item was used to delineate the two groups M group and U group. Sociodemographic data and data on the mental disorder were taken from the medical records. The Global Assessment of Functioning Scale (GAF) [19] was used to assess the functioning level of the patients.

Statistical procedures

Pearson's correlations were used, as a statistical procedure, to explore relationships between the IAAM and SKI scales, two-tailed Student's t-tests and chi-quadrat-tests to find out group differences, e.g. in gender. In this exploratory study the term "significant" was used for results with a p-value of ≤ 0.05. The data were analyzed using Statistical Package of the Social Sciences (SPSS 21.0 for Windows) software.

Results

Patients of the U and M group did not differ in gender, age and the global functioning as measured by the GAF (global assessment of functioning) score. Compared to the U group, patients of the M group described themselves as more attractive (r=0.159; p=.042), and – as trends – used music more for relaxation (r=0.151; p=.056) and for reduction of negative activation (r=.130; p=.096). Furthermore, patients of the M group did not stop listening after onset of the mental disorder (p=.014) and showed a trend towards a feeling of a helpful role of music (p=.084). In addition, they listened to music more in the foreground, which suggests a more conscious use of music (p=.068). Ninety-five patients had learned an instrument, of which 58 called themselves musical, while out of 73 patients who did not learn any instruments, 30 called themselves musical (p = 0.010). Twelve patients liked to sing, of which 11 patients described themselves as musical (p = 0.004). In 69 patients, music played an important role in the family of origin, 54 of whom described themselves as musical, while out of 101 patients in whom music played no role in the family, 36 patients described themselves as musical (p <0.001). Out of 121 patients, for whom music plays a special role in music, 75 patients described themselves as musical, while in 51 patients music played no special role, of which 16 patients nevertheless described themselves as musical (p <0.001).

Discussion

Patients of the U and M group did not differ in gender, age and the global functioning as measured by the GAF (global assessment of functioning) score. Compared to the U group, patients of the M group described themselves as more attractive (r=0.159; p=.042), and – as trends – used music more for relaxation (r=0.151; p=.056) and for reduction of negative activation (r=.130; p=.096). Furthermore, patients of the M group did not stop listening after onset of the mental disorder (p=.014) and showed a trend towards a feeling of a helpful role of music (p=.084). In addition, they listened to music more in the foreground, which suggests a more conscious use of music (p=.068).

Compared to the U group, patients of the M group described themselves as more attractive which might indicate a better self-esteem. Interestingly, attractiveness appears to be a major feature of using music for emotion modulation. As well, patients who consider themselves musical and for whom listening to music has a great impact in their life find themselves to be attractive. This evokes the idea of Charles Darwin that music abilities might have evolutionary advantages by impressing the other gender though this theory is of minor interest today. Nevertheless, this cluster of musical abilities and positive emotional traits as attractiveness combined with skills of relaxation and reduction of negative emotions by music could reflect a neurobiological pathway such as the so-called Behavioral Activation/Facilitation System (BAS/BFS [20-24]) which appears to be associated with heightened activity of the mesolimbic dopaminergic system [25] (see also Gebhardt *et al.* [26].

The facility of patients of the M group of using music more for relaxation and for reduction of negative affects reflects the – in this state of psychopathology – helpful strategies of "venting" emotions on an emotional level. In contrast, patients of the U group seem to use music less specifically for emotion modulation. In a further study we could show that patients with music therapy are more capable to switch to cognitive-focused emotion modulation strategies and thus are able to use music even more for the psychotherapeutic transformation of earlier emotionally charged experiences and resulting behavioral patterns [12]. Thus, it can be assumed that musicality is much less important, if the patients are in a music therapy, but so far this has not been studied. Music therapy patients can achieve a sustainable therapeutic effect, presumably also on their self-image or personality structure [12,27].

The good relationship to music in the M group could have succeed in the fact that these patients – even after onset of the disease - have not stopped listening to music and that they continued to believe that music would help them. They reported to listened to music more in the foreground than the background, thus a very conscious approach. It goes without saying that the variable "self-efficacy" certainly plays an extremely important role, even if it was not specifically collected as such variable in the current study.

The fact that patients of the M group already had a special relationship to music from their biography (meaning of music in the family ($p<0.001$), personal meaning of music ($p<0.001$)) could be seen as a helpful resilience factor from the childhood on for later crises. Nevertheless, this factor is likely to lose importance when music therapy is applied, since here musicality in itself is not a prerequisite, but rather sometimes even an obstacle, in the sense of a lack of emotional spontaneity or authenticity.

Almost half of the patients have described themselves as being unmusical, although only 4% of an amusia can be assumed [7]. Thus, the psychological component in terms of a reduced self-esteem in this self-assessment should be large. Particularly interesting and challenging in practice is the question of how these patients can be supported in their self-efficacy and in their emotion modulation strategies. For example, reframing may be required by showing patients the prevalence and risk data of suffering from an amusia. Certainly, in addition to a specific psychoeducation with regard to UofM [28] a conventional music therapy is helpful. Here is a need for further studies that need not rely solely on music as a medium, but also on other resource-oriented creative therapy techniques, such as art therapy.

Limitations and strengths

One limitation is the cross-sectional design, instead of a prospective or randomized-controlled design. Therefore, causal relationships cannot be inferred. The listed p-values are hence of an explorative nature. However, the data represent real world conditions. Another limitation concerns the interpretation of the results: the correlation coefficients are comparably low, which probably reflects the complex dynamics of personality dimensions and emotion modulation strategies which interact among each other and are not constantly present.

The strength of this study consists of the empirical approach on the basis of an emotion modulation concept of UofM. Patients of the U and M group did differ in gender, age and the global functioning as measured by the GAF (global assessment of functioning) score, so that the results are representative. The psychiatric population might show some results in a more focused way than in the general population – the examination of relations between musicality, UofM, and personality dimensions might therefore be facilitated.

Conclusion

The use of music often has a crucial role in everyday life of patients with mental disorders. For music is a cognitive-emotional entity which both portrays and influences psychological processes, psychiatric pathomechanisms might be additionally unraveled by this approach. This study shows first exploratory data on the role of musicality in patients with mental disorders.

The study indicates that patients who perceive themselves as musical individuals experience themselves more favorable in their self-image and use music more for relaxation and to reduce negative affectivity. In addition, these patients do not abandon such emotion modulation strategies when they become ill with a mental disorder, suggesting a higher level of self-efficacy, which in turn should be helpful for therapeutic success.

Increasing knowledge about the influence of music on mental disorders might lead to a greater relief from mental distress by a more specific handling of music and should also be useful in music therapy. Further studies on the clinical impact of music on the basis of this approach are warranted.

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