Finding words for emotions: The reactions of patients with major depressive disorder towards various musical excerpts

Ehud Bodner, Ph.D. a, b, *, Iulian Iancu, M.D. c, Avi Gilboa, Ph.D. b , Amiram Sarel, M.D. c , Avi Mazor, M.A. b , Dorit Amir, D.A., ACMT b

a Music Department and Interdisciplinary Department of Social Sciences, Bar-Ilan University, Ramat-Gan 52900, Israel
b Music Department, Bar-Ilan University, Ramat-Gan, Israel
c Psychiatry Department B, Beer Yaakov Mental Health Center, Beer Yaakov and the Sackler School of Medicine, Tel Aviv University, Tel Aviv

Abstract

This study aims to show that the specific use of sad music in patients with major depressive disorder can circumvent the verbal barrier they typically experience when asked to express their emotions.

We examined the effect of four emotionally distinctive types of music (i.e. happiness, fear, anger, and sadness) on 14 hospitalized patients with major depressive disorder (MDD group) and 31 healthy controls (HC group). Participants were asked to choose emotional descriptors that expressed the feelings that were induced in them by each excerpt. We hypothesized that in the specific case of sad music, patients with MDD would describe the music more vividly than HC participants.

Patients with MDD chose fewer emotional labels than controls in response to angry, scary, and happy excerpts. Patients with MDD and controls chose similar emotional labels in response to sad music, but patients with MDD chose more labels in response to sad music than to any other excerpt, while controls demonstrated the exact opposite pattern.

These findings are in line with clinical descriptions of patients with MDD as demonstrating difficulties in verbalizing their emotions. Their intensified response to sad music is in accordance with their focus on sad cues. The use of sad music in psychotherapy is thus recommended as means of bypassing the verbal barrier experienced by patients with MDD.

Keywords: Depression; Cognitive bias; Sad music; Music therapy; Alexithymia

Introduction

The idea that verbalizing emotions can alleviate patients of pain associated with these emotions, and improve their interpersonal communication of emotions, is a basic idea in verbal psychotherapy (Gurman & Messer, 1995; Singer, 1965; van der Kolk & Fisler, 1994; Wolberg, 1967). The conventional therapeutic stance regarding MDD holds that in order to establish an initial connection with patients with MDD it is important to encourage them to communicate verbally on their sad emotional level and not aim at making them happy. Psychodynamic and Cognitive-Behavioral psychotherapies, for instance, focus on the patients’ experience of their suffering, either through psychoanalytic interpretation (Blatt, 1998), or through a Socratic immersion into the patients’ painful and subjective experience of reality,
as it is reflected through the prism of their negative cognitions (Beck, Rush, Shaw, & Emery, 1979). Erickson, too, offered the “pacing and leading concept” (Bandler & Grinder, 1975), which suggests to first attune and join the patients’ emotional state, and only then find the way to lead them out of it.

Continued negative experiences and the preponderance of negative thoughts in patients with MDD have been empirically shown (Haaga, Dyck, & Ernst, 1991; Mathews & MacLeod, 1994). Such thoughts have been depicted as a network of negative schemas (Beck et al., 1979) that include both unconscious and conscious negative biases toward various types of stimuli such as facial expressions. Those, in turn, promote a more negative view of the world, self, and others. Researchers assume that the negative schemas stimulate a variety of negative associations and thus receive greater cognitive elaboration. According to this cognitive view (Lyubomirsky & Nolen-Hoeksema, 1993; Nolen-Hoeksema, 1991), the activation of the negative network enhances negative content, thus creating a vicious cycle: the elaborated negative schemas drive the patients’ attention to negative content, and as they respond to these negative stimuli, they continue to ratify their existence and build up their negative schemas.

The full cycle of negative schemas can explain why patients with MDD choose sadness as their preferred facial expression and identify the most with this facial expression, while healthy controls prefer and identify with a happy facial expression (Bouhuys, Geerts, & Gordijn, 1999; Hale, 1998; Mandal & Palchoudhurg, 1985, 1986).

The focus on negative features and on sadness not only increases depression, but also adds obstacles to verbal interaction between patient and therapist (Krystal, 1979, 1988; Muller, 2000). It is added onto the many other characteristics of patients with MDD that hinder communication, such as passivity, resistance to change, compulsive tendencies, the victim role they frequently assume (Leahy, 2001), and difficulty in emotional awareness and its verbal expression (alexithymia) (see Fig. 1).

A recent development in the field of emotional expression in depression constitutes the study of the impact of music on the verbal expression of emotions. Music has an advantage over words in inducing emotions and enhancing communication and has been found to be a very powerful mood inducer as well (Clark & Teasdale, 1985; Kenealy, 1988; Martin, 1990; Parrott & Sabini, 1990). Music is known as a pre-verbal form of emotion (Hauge & Tonsberg, 2003; Stansell, 2001). Therefore, it can bypass psychological defenses later on in life (Salmon, 2001). In addition, music therapy is described as an effective technique with a variety of patients with MDD—adolescents (Field et al., 1998; Hendricks, Robinson, Bradley, & Davis, 1999; Jones & Field, 1999), adults (McKinney, Antoni, Kumar, Tims, & McCabe, 1997), the elderly (Ashida, 2000; Hanser & Tompson, 1994), and the bereaved (Smeijsters & van Den Hurk, 1999). Music also stimulates physical responsiveness in Alzheimer’s patients (Cevasco & Grant, 2003).

In this study, we aimed to show that the specific use of sad music in patients with MDD can circumvent the verbal barrier they typically experience when attempting to express their emotions. Specifically, we examined the impact of different excerpts of classical orchestral music on patients with MDD and on healthy controls. We examined whether patients with MDD would use extensive verbal labeling for any specific emotion. Based on the findings that patients with MDD react with increased responsiveness to negative cues (Lyubomirsky & Nolen-Hoeksema, 1993; Nolen-Hoeksema, 1991), we hypothesized that these patients would be more responsive to sad music in comparison to other

Fig. 1. The vicious cycle of depression.
emotions, i.e. they will offer a more elaborate verbal description of sad music in comparison to any other type of music. We also hypothesized that healthy controls would be less reactive to sad music, since the tendency to be more focused and more responsive to negative cues has been found only in patients with MDD.

Method

Participants and design

Forty-five participants participated in the study. All were between 20 and 70 years of age. They were born in Israel and had a complete knowledge of the language. Both patients and controls were of European descent. None of them was a musician or had a specific interest in classical music. Yet, as classical music is played on many Israeli radio and TV stations, and since the musical excerpts were chosen from famous musical compositions, they might have been exposed to them before.

The participants were arranged into two groups. The patients with MDD consisted of 14 participants, 9 women and 5 men (mean age 44.9 ± 15.2). They were all inpatients in a psychiatric hospital and were diagnosed according to the DSM-IV criteria (APA, 2000) as suffering from current MDD at the time of the study. All patients were receiving anti-depressant medications. Patients with comorbid psychiatric conditions were excluded from the study. The healthy controls group (HC) included 31 undergraduate students, 16 women and 15 men, aged 30.5 ± 8.6, who had no psychiatric history.

Instruments

The Beck depression inventory (BDI)

The Beck depression inventory (BDI – Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was used in order to measure depression. This questionnaire includes 21 items referring to emotional, cognitive, behavioral, and physical symptoms and attitudes that are consistent with depression. Answers are mapped on to a scale from 0 = nonexistent to 3 = very serious. A typical item is “(0) I do not feel like a failure; (1) I feel I have failed more than the average person; (2a) I feel I have accomplished very little that is worthwhile or that means anything; (2b) As I look back on my life, all I can see is a lot of failures; (3) I feel I am a complete failure as a person.” The Hebrew version of the questionnaire has an internal consistency of α = 0.76 (Landau & York, 2004).

While 81% (25 participants) of the HC scored less than 10 (no depression), and none of the rest scored above 18 (mild to moderate depression), 64% of the participants with MDD (9 participants) scored between 10 and 18 (mild to moderate depression), and the rest scored between 19 and 46 (moderate to severe depression). In addition, the patients with MDD scored higher on the BDI in comparison to the HC (21.11 ± 12.71 versus 6.00 ± 4.57), and a t-test for independent samples demonstrated this difference to be significant, t(43) = 5.89, p < 0.0001.

List of emotions

Emotional words were collected from three psychopathological questionnaires: BDI (Beck et al., 1961), Minnesota Multiphasic Personality Inventory (MMPI) (Butcher, Graham, Williams, & Ben-Porath, 1990), and the Symptom Checklist-90 (Derogatis, 1979). The words were arranged into a list of 100 items, in accordance with the questionnaire of Hevner (Farnsworth, 1954). Seventy-seven clinicians (38 psychologists, 25 psychiatrists, and 14 social workers) were asked to decide whether or not each of the items characterized the emotional state of patients with MDD. Only items with a high percentage of agreement (>70%) were included in the final list of emotions. The final list of emotions contained 42 items, each belonging to one of the four typical emotional categories that were measured (i.e. anger, fear, happiness, and sadness) and their derivatives, according to the Circumflex Model of emotions (Russell, 1980) (e.g. furious for anger, scared for fear, cheerful for happiness, and melancholic for sadness). The number of sad and happy words was balanced, as well as the number of anger and fear words.

Musical excerpts

Four orchestral excerpts of music were chosen to represent each of the four basic emotions: happiness, fear, anger, and sadness (see Table 1). The excerpt that represents happiness is characterized by a lively and fast tempo, high pitches, and rising, energetic melody. The excerpt that represents fear is characterized by a rapid and jerky tempo, low sounds,
Table 1
The seven music excerpts (arranged by the names of composers)

<table>
<thead>
<tr>
<th>Musical excerpt</th>
<th>Emotion</th>
<th>Agreement Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beethoven, Ludwig van. <em>Symphony no. 3 op. 55 in Eb major</em> (Eroica), 2nd movement (opening).</td>
<td>Sadness</td>
<td>88%</td>
</tr>
<tr>
<td>Debussy, Claude. <em>Prélude à l’après-midi d’un faune</em> (excerpt).</td>
<td>Neutral</td>
<td>*</td>
</tr>
<tr>
<td>Handel, Frederick. “Water music,” Air from <em>Suite no. 1 in F major</em>.</td>
<td>Neutral</td>
<td>*</td>
</tr>
<tr>
<td>Prokofiev, Sergey. <em>Symphony no. 1 op. 25 in D major</em>, 4th movement “Finale: molto vivace” (opening).</td>
<td>Happiness</td>
<td>90%</td>
</tr>
</tbody>
</table>

(*): An excerpt that no more than 30% evaluated as reflecting a distinctive emotion and that was distributed between no less than four categories was considered as neutral.

dissonant harmonies, and full chords, with sudden loud bursts. The excerpt that represents sadness is characterized by a slow pulse and gentle rhythms, with no sustained tension, slow manner, and low rates of intensity. The excerpt that represents anger is characterized by sudden changes in rhythmic patterns, accentuated beats, and forceful, loud sounds. These emotions in the music were chosen in accordance with most theoreticians of emotions who support a categorical approach to emotions (Ekman, 1992; Gabrielson & Lindstrom, 1995; Izard, 1977; Juslin, 1997; Oatley, 1992; Plutchik, 1994; Power & Dalgleish, 1997; Sunberg, 1982).

In a preliminary study, 20 classical excerpts were chosen according to their emotional characteristics (Bunt & Pavlicevic, 2001). They had been labeled by 150 participants (undergraduate students from the social sciences department at the university) as to the dominant emotion (i.e. happiness, fear, anger, and sadness, distributed equally) each of them conveyed. Excerpts which were not characterized by a specific emotional cluster were marked as neutral.

Out of the 20 excerpts, four excerpts were chosen. An excerpt was chosen only if it had received an agreement rate higher than 75%. Musical excerpts that had received an agreement rate of 30% or less were termed “neutral” (see Table 1). Three neutral excerpts were played between the emotional excerpts and served as buffers in order to prevent an emotional carryover effect. We also utilized the neutral excerpts as possible controls to the emotional excerpts. The length of each excerpt was about 1 min.

**Procedure**

The study was approved by the institutional review board, and the participants were asked to sign an informed consent form. It was conducted at the psychiatric department (patients with MDD) and at the university (group of HC) in small groups of about 3 to 4 participants each. In spite of the apparent differences between the hospital and the university surroundings, the listening conditions were similar for both groups. They were informed that the study was designed in order to examine the manner by which emotions evolve in people when listening to music, and that emotions are basically subjective and, therefore, there are no correct/incorrect answers. They were asked to listen to each musical excerpt and, while it was being played, to mark the emotions they experienced. The seven musical excerpts were then played in a counterbalanced order. After finishing that part of the experiment, the participants filled in the BDI. This procedure is a widely used paradigm (e.g. Behrens & Green, 1993; Bodner & Gilboa, 2006; Gilboa, Bodner, & Amir, 2006; Juslin, 1997).

**Results**

We first examined the hypothesis that patients with MDD would use fewer words than the HC in order to describe their emotional experience in response to music. Thus, we compared the number of words they chose in response to each musical excerpt.

Table 2 shows that, in general, patients with MDD chose fewer items in response to excerpts of music ($M = 2.18$) than HC ($M = 3.38$). This tendency was confirmed through a two-way repeated measure analysis of variance, with groups
Table 2
Mean and SDs of number of items chosen in response to the four emotional excerpts of music according to group

<table>
<thead>
<tr>
<th>Music</th>
<th>Group</th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients with MDD</td>
<td>Healthy controls</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Happy</td>
<td>2.43 (3.23)</td>
<td>4.29 (2.24)</td>
<td>3.71 (2.69)</td>
<td></td>
</tr>
<tr>
<td>Scary</td>
<td>2.07 (2.09)</td>
<td>3.84 (2.53)</td>
<td>3.29 (2.52)</td>
<td></td>
</tr>
<tr>
<td>Angry</td>
<td>2.57 (2.24)</td>
<td>4.68 (3.07)</td>
<td>4.02 (2.98)</td>
<td></td>
</tr>
<tr>
<td>Sad</td>
<td>3.14 (3.03)</td>
<td>3.32 (2.17)</td>
<td>3.27 (2.43)</td>
<td></td>
</tr>
<tr>
<td>Neutral 1</td>
<td>2.14 (2.21)</td>
<td>3.39 (2.70)</td>
<td>3.00 (2.60)</td>
<td></td>
</tr>
<tr>
<td>Neutral 2</td>
<td>1.71 (1.54)</td>
<td>2.94 (1.37)</td>
<td>2.56 (1.51)</td>
<td></td>
</tr>
<tr>
<td>Neutral 3</td>
<td>1.21 (1.37)</td>
<td>1.22 (1.02)</td>
<td>1.22 (1.13)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2.18 (1.74)</td>
<td>3.38 (1.54)</td>
<td>3.00 (1.68)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Each subject chose from the emotions list those emotions that he/she felt fitted the music excerpt. The number presented is the mean number of words chosen by each group of subjects, and for each musical excerpt.

(MDD or HC) and musical excerpt as the independent variables and number of words assigned by the participants as the dependent variable was performed. It revealed a significant main effect for the group variable, $F(1, 43) = 5.37$, $p < 0.05$. Separate follow-up analyses revealed that the differences were significant in all emotional excerpts of music: happy, $t(43) = -2.24$, $p < 0.05$, scary, $t(43) = -2.28$, $p < 0.05$, and angry, $t(43) = -2.30$, $p < 0.05$, except for the sad excerpt, where patients with MDD and HC obtained similar results, $t(43) = -0.23$, $p > 0.05$. No consistent differences between groups were found concerning the neutral excerpts of music, $t(43) = -1.5$, $p > 0.05$, for the first neutral excerpt, $t(43) = -2.67$, $p < 0.05$, for the second neutral excerpt, and, $t(43) = -0.03$, $p > 0.05$, for the third neutral excerpt.

Results also indicated the existence of a significant interaction between the emotional excerpt of music and the group of participants, $F(6, 258) = 2.12$, $p < 0.05$. The results show that patients with MDD and HC had different patterns of response to the emotional excerpts of music. Patients with MDD labeled the sad excerpt with the most words compared to all other excerpts, while HC labeled the sad excerpt with the least words. To confirm this pattern, planned single comparisons were performed between each non-sad excerpt of music and the sad excerpt of music. Indeed, these contrasts revealed that the interaction was evident for all non-sad emotional excerpts of music (happiness, fear, and anger) but not for the neutral excerpts. Fig. 2a–c present the three interactions between type of music and group.

While HC chose more emotional labels in response to happy music than they did for sad music, patients with MDD chose more emotional items to describe sad music than they did for happy music, $F(1, 43) = 5.44$, $p < 0.05$. Similarly, HC chose more emotional items in response to scary music than they did for sad music, in contrast to patients with MDD who chose more emotional items in response to sad music than they did for scary music, $F(1, 43) = 4.87$, $p < 0.05$. Finally, whereas HC chose more emotional items in response to the angry music than they chose for sad music, patients with MDD chose more emotional items when they heard sad music than when they listened to the angry music, $F(1, 43) = 4.92$, $p < 0.05$. In sum, patients with MDD chose more items in response to sad music than to any other emotion, while HC chose fewer items in response to sad music than to any other non-sad emotion. This pattern of interaction was not evident when analyzing the neutral excerpts of music. In all three cases the interactions were non-significant.

Discussion

In the present study, we examined the effect of different excerpts of music on the verbal labeling of patients with MDD. We assumed that in general, patients with MDD would react to emotions in a restricted manner, using very few words to describe them in comparison to HC. However, when presented with sad music, we presumed that patients with MDD would be more elaborate.

The assumption that patients with MDD would choose fewer items to describe their emotions in comparison to HC was confirmed. This is typical to major depression, since one of the most reported symptoms of patients with MDD is a lowered responsiveness to external stimuli (Rosenhan & Seligman, 1995). A more elaborate examination of emotional response to the different excerpts of music revealed that the differences between the HC and the patients with MDD were found only in response to certain emotional excerpts and not for others. As long as the emotion expressed was not sad, patients with MDD were low on verbal labeling. However, when sad music was presented, no difference was
found between the groups. This supports our assumption that the patients with MDD were alexithymic, even though they were under medication at the time of the experiment.

A closer look at the response patterns of patients with MDD to the different excerpts confirmed another assumption we had made: patients with MDD tended to describe the sad music more elaborately than any other type of music. HC,
on the other hand, tended to choose fewer items in response to sad music as compared to any other sort of emotion in music. This pattern of results is in accordance with the structural cognitive theories that describe a more elaborate network of negative schemas in patients with MDD (Mathews & MacLeod, 1994). This, in turn, stimulates a variety of negative associations, and therefore receives more attention and amplifies the accessibility of negative affective recollections (Moffitt, Singer, Nelligan, & Carlson, 1994; Williams & Broadent, 1986). This finding is in line with the preference of patients with MDD for faces with a sad expression and their identification with those sad facial expressions (Bouhuys et al., 1999; Hale, 1998; Mandal & Palchoudhurg, 1985, 1986). It is also compatible with the findings by Nielzen and Cesarec (1982), who reported that patients with MDD experienced music as less attractive and less cheerful. Therefore, it is possible that the patients with MDD identified more words in response to sad music due to their inner state of mind and their cognitive bias towards sad emotions. On the other hand, the HC, who typically do not focus on sad emotions, found more words for those excerpts that induced happiness, anger, or fear. These emotions are known to induce more physiological arousal than sadness (Russell, 1980), thus explaining why they attracted more attention and more labeling on the part of the HC.

An additional explanation for the HC’s difference of response regarding the happy versus sad excerpts is based on Surguladze et al. (2003). In an imaging study with healthy individuals, Surguladze demonstrated that when expressions of happiness were increased in intensity (mild to prototypical), the activity within the visual cortex and striatum increased as well. On the other hand, when expressions of sadness were increased in intensity, the activity within the visual cortex and hippocampus decreased. This added physiological response in controls strengthens their attraction to happy expressions, which in turn, results in increased verbal responses as well.

Though many studies referred to the curing effects that music has on patients with MDD (Jones & Field, 1999, concerning adolescents; McKinney et al., 1997, concerning adults; Hanser & Tompson, 1994; Ashida, 2000, concerning the elderly; Bright, 1999; Smeijsters & van Den Hurk, 1999, concerning the bereaved), very few studies concentrated on the clinical mechanisms that enable curing to take place. The current study was an attempt to investigate how music could facilitate the verbal expression of patients with MDD.

From a theoretic perspective, should music evolve as an efficient therapy for patients with MDD, we believe that sad music can serve as a proper stimulus to “pace” with patients afflicted by MDD and form an initial rapport. Sad music can bring forth the patients’ interest in opposition to their alexithymic tendency and increase their will to put affect into words. The patients might resist speaking of their own affective state, but they will more easily be willing to use sad music as an object on which to project their emotions. This could be a vital stage in establishing a connection with the therapist. After the first connection is made, “leading” may take place and the therapist can offer other, more varied emotional tones and moods. The course of “pacing and leading” in therapy has its musical formation in Altshuler’s [1943] “Iso Principle,” by which the music therapist should first try and tune himself to the emotional tone of the patient. Only after an emotional fit is achieved should he gradually move to other emotional domains together with the patient.

Unfortunately, due to various limitations, the current study is lacking in the number of participants and the discrepancy in age between the two groups. We therefore propose that additional studies be conducted to further confirm the hypothesis that sad music is an effective instrument in helping patients with MDD to recognize their emotions and express them. It also remains to be shown how this particular kind of emotional expression could be developed as an effective interactive tool in a therapeutic setting as well. Future field studies should try and broaden the validity of the current study to the clinical setting of music therapy, by comparing the impact of emotional tones of pre-composed music on the inter-relation between patient and therapist. These studies can monitor cognitive and behavioral changes in patients with MDD, such as postural changes and ability to verbalize painful emotions.

References


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