

# Music and madness: neuropsychiatric aspects of music

Marco Mula and Michael R Trimble

**ABSTRACT** – Music has soothed the souls of human beings for centuries and it has helped people recover from ailments since ancient times. Today, there is still a widespread interest in the relationship between music, affect and mental illness. This article is aimed at reviewing these complex relationships, starting from a wide perspective on the neurobiology of emotions, perceptions and music language to a detailed analysis of psychopathology in famous musicians.

**KEY WORDS:** bipolar disorder, creativity, cyclothymia, music

## Introduction

*By means of music the passions enjoy themselves.*  
Nietzsche F, *Beyond good and evil*, Aphorism 106

In neuroscience, much effort is at present underway trying to define the cerebral components of musical intonation, nicely reviewed in an earlier paper from this series.<sup>1</sup> It seems to be the case that various locations and circuits may be identified for certain aspects of the sensory input of musical sounds, and similar experiments in the visual area have been concerned with which bits of the brain do what, for example, when a subject views a recognised artistic painting as opposed to alternative sensory inputs. This is most revealing, but sometimes seems to drift away from the central point of art generally and, in the context of this article, music, namely the ‘experience of the experience’, the feeling state that is aroused which leads to the aesthetic satisfaction. This empiricist limitation is in part due to the primary concern of Anglo Saxon philosophy with visual sensations, and since a large part of the human cerebral cortex is given over to vision, it is easier to visualise with imaging techniques than the neuroanatomy of audition or any underlying emotion. However, there is a sea change, driven to some extent by the growth of interest in the cerebral basis of emotion, and of a philosophical approach to consciousness, with attempts to break-down the Cartesian mind–brain, subjective–objective, inside–outside dichotomies that lie behind these restricted approaches. A mechanistic approach to artistic appreciation which leaves the perceiver out of the equation must ignore the emotional penumbra so closely imbricated within

the aesthetic. In this paper, it is the relationship between emotions and music that is discussed, along with the empirical observation that, in some cases, distinctive affective temperamental features can be recognised among composers and musicians. This, of necessity, touches not only affect but also its disorders including frank psychopathology.

## Music and affect

One constant finding to emerge from the studies of the effects in the brain of listening to music is the emphasis on the right (non-dominant) hemisphere.<sup>2</sup> This is not to wish to imply from the start that there is a simple left–right dichotomy of functions in the brain. However, it is the case that traditional neurology has, to a large extent, ignored the talents of the non-dominant side of the bicameral brain, much in favour of the dominant (normally left) hemisphere. In part, this stems from an overemphasis on the role of the latter in language, especially propositional speech processing, and a lack of interest in the emotional intonations that give so much meaning to the expression. Prosody refers to the poetic rhythm and emotional tone of that which is spoken, and the contribution of the non-dominant hemisphere to this is now well accepted. It was observed clinically, that patients with right hemisphere brain lesions, while superficially seeming to have intact language skills, often missed the entire point of a conversation and spoke with a flattened tone of voice, lacking of emotional expression – in other words, they lacked prosody. Ross expanded on these observations, and described the aprosodias.<sup>3</sup> He proposed that affective prosody was a relevant function of the right hemisphere, and that the areas of the right hemisphere that subserved this function were analogues to those that were involved with propositional language on the left side of the brain.

Is music a language? What kind of survival value could music have conferred to early hominids in comparison to propositional speech? This is quite an old debate, and it has been discussed in some detail elsewhere.<sup>4</sup> Darwin considered music to have evolved from primate sexual selection calls, and argued for a common origin of music and language.<sup>5</sup> Music and language are communication devices to express emotional meaning through high-registered socially accepted patterned sound, and a musical grammar

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may perhaps be discerned akin to language grammar. Corballis remarked:

*Given the rather diffuse yet pervasive quality of music in human society, it may well have been a precursor to language, perhaps even providing the raw stuff out of which generative grammar was forged.*<sup>6</sup>

Some support from these views comes from the work of Mithen, who has argued that spoken language and music evolved from a proto-language, a musi-language which evolved from primate calls used by the Neanderthals: it was emotional but without words as we know them.<sup>7</sup>

The link between music and emotion seems to be accepted for all time.<sup>8</sup> Plato considered that music played in different modes would arouse different emotions, and as a generality most of us would agree on the emotional significance of any particular piece of music, whether it is happy or sad, for example. Major chords are cheerful, minor ones sad. The tempo or movement in time is another component of this, slower music seeming less joyful than faster rhythms. This reminds us that motion is a significant part of emotion, and that in the dance we are moving – as we are moved emotionally by music.

Meyer explored in detail the meaning of music, especially from an emotional point of view.<sup>9</sup> Music, if it does anything, arouses feelings and associated physiological responses, and these can now be measured. For the ordinary listener, however, there may be no necessary relationship of the emotion to the form and content of the musical work since ‘the real stimulus is not the progressive unfolding of the musical structure but the subjective content of the listener’s mind.’<sup>9</sup> Such a phenomenological approach directly contradicts the empirical techniques of so much current neuroscience in this area.

**From psychopathology to music: a lesson from world-famous musicians**

A comprehensive literature seems to suggest a link between psychopathology and creativity. The works of Andreasen, Jamison, Post, Ludwig and Wills pointed out a high prevalence of mental illnesses, in particular mood disorders, among famous creative people (eg writers, poets, painters, composers and so on).<sup>10–15</sup> Conversely, studies looking at creativity in patients with mood disturbances showed that no more than 8% of sample of bipolar I, bipolar II and unipolar patients could be considered creative,<sup>16,17</sup> suggesting that creativity could be mediated by sub-threshold psychiatric syndromes, or better temperamental structures such as cyclothymia, rather than full-blown psychiatric disorders.<sup>16,18</sup> In fact, although creative samples have a significant excess of bipolarity, manic-depressive illness is relatively uncommon.<sup>19</sup> These data are compatible with the hypothesis that it is the dilute temperamental form of bipolarity that subserves creativity.<sup>20</sup> The creative process may involve the suffering of melancholia, the cognitive and/or perceptual visions associated with cyclothymia, and the energy of the hyperthymia. Certainly, talent is a necessary ingredient but it is likely that creativity in different professional domains is related to optimal mixes of temperamental and cognitive profiles.<sup>15,20–22</sup>

Biographies of famous musicians have been reviewed in an attempt to suggest a psychiatric diagnosis. Obviously, the attempt to transform descriptions of subjects from biographies into specific DSM diagnoses cannot achieve high levels of validity and reliability, mostly because biographers may be biased in the way that they select and interpret facts. Handel’s life is a typical example. He has been thought by many authors to be cyclothymic.<sup>23,24</sup> However, the relative lack of autobiographical materials and reliable contemporary medical accounts makes any diagnostic formulation necessarily tentative.<sup>19</sup> This important limitation has been acknowledged by many authors.<sup>12,14,15</sup> However, several seem to agree on the psychopathology of many famous classical and non-classical musicians (Table 1).

**Table 1. Famous musicians and composers with psychopathology.** Adapted from References 11–15 and 38.

<b>Classic musicians</b>	
Beethoven	– Major depression?
Berg	– ?
Berlioz	– Bipolar spectrum
Brahms	– Bipolar spectrum
Bruckner	– ?
Cherubini	– Bipolar spectrum
Chopin	– Major depression (organic)
Duparc	– Bipolar spectrum
Gluck	– Bipolar spectrum
Mahler	– Bipolar spectrum and obsessive compulsive behaviour (personality disorder?)
Mendelssohn	– Bipolar spectrum (organic)
Mozart	– Bipolar spectrum?
Mussorgsky	– Psychosis (alcohol abuse)
Rachmaninoff	– Dysthymia?
Rossini	– Bipolar spectrum?
Schubert	– Bipolar spectrum
Schumann	– Bipolar disorder I
Scriabin	– Bipolar spectrum
Johann Strauss	– Panic disorder
Tchaikovsky	– Bipolar disorder II
Wagner	– Bipolar spectrum?
Wolf	– Bipolar disorder II (organic)
<b>Jazz musicians</b>	
Davis	– Major depression
Desmond	– Dysthymia
Bill Evans	– Dysthymia
Gil Evans	– Major depressive episode
Getz	– Major depression
Mingus	– Cyclothymia and major depression
Mulligan	– Mood disorder NOS
Parker	– Major depressive episode
Pepper	– Mood disorder (substance abuse)
Pettiford	– Cyclothymia?
Porter	– ?
Rosolino	– Major depressive episode?
<b>Rock musicians</b>	
Barrett	– substance abuse
Cobain	– substance abuse
Morrison	– substance abuse

? = controversial; NOS = not otherwise specified.

### *Classical music*

As far as classical music composers are concerned, mood disorders are often described and range between 34.6% and 41%.<sup>12,13,25</sup> In at least one third of cases, symptoms have been clearly responsible for the interruption or cessation of their creative work, disruption of life patterns and sometimes relationships. Robert Schumann, who died in an asylum in 1856, is a typical example of a major mood disorder sufferer. His compositional output waxed and waned dramatically over his professional life, reflecting to some degree his emotional state probably disrupted by a bipolar disorder.<sup>19,26</sup> In fact, despite the reasonable suspicion that Schumann may have died from neurosyphilis, the family history of suicide is highly suggestive of a bipolar disorder that, ultimately, led to a suicide attempt in February 1854, and to his eventual death in July 1856.

Gustav Mahler presented an obsessional neurotic personality, well known also to Freud, with an over-attention to details of staging and musical production; these behavioural symptoms associated to a not well-defined movement disorder, led to speculations on a possible Sydenham's chorea.<sup>27</sup> However, Mahler's mood instability and the family history for psychiatric disorders may also suggest a bipolar trait or, at least, a cyclothymic disorder. He was the second eldest of a large family, his brother Alois misrepresented himself in a grandiose way and manifested an exceptionally extravagant lifestyle, his sister Justine presented hallucinations and his brother Otto committed suicide.<sup>19</sup>

As far as psychotic illnesses are concerned, there may seem to be a discrepancy among studies with prevalence rates ranging between 1% and 10%.<sup>12,13</sup> Unfortunately, Ludwig's series poorly discriminates between affective psychoses and schizophrenia in part a reflection of the status of American psychiatry at the time he was writing. Further, although the occurrence of a psychosis in one tenth of cases may be considered high, it is important to acknowledge that many probably suffered organic psychosis due to the high rates of alcohol abuse (21.2–40%) and disorders such as syphilis. Compared to alcohol abuse, data about substance dependence or abuse are quite fragmented in these composers.

### *Jazz, pop and rock music*

Although several authors enjoyed speculating on lives of famous classical music composers, studies on jazz, pop or rock music are still an exception to the rule. Wills reviewed biographical data of 40 jazz musicians and mood disorders were probably or definitely identifiable in 28.5% and suicide attempts in 2.5%.<sup>15</sup> Anxiety disorders, especially obsessive-compulsive disorder, could be diagnosed in 5% of cases. Psychotic disorders were reported in 7.5%.<sup>15</sup> Included in that series was Bud Powell, who had numerous admissions to mental hospitals and was described as having paranoid delusions and auditory hallucinations. It is difficult to say whether he actually had schizophrenia or a schizoaffective disorder or even a bipolar disorder. The rate of illicit drug-related problems among jazz musicians is of particular interest. In Wills' sample, 52.5% had heroin addiction at some time during their lives. This rate is much higher than that

reported for classical composers by Ludwig and Post, but this could be due to a number of biases in data collection that underestimated substance abuse among classical composers and the flourishing of a number of synthetic compounds of abuse in recent times.<sup>12,13</sup>

### *Rock music, heavy metal and suicide*

The issue of possible relationships between adolescents' music preference and aspects of their psychological health and lifestyle has been a matter of concern. A preliminary investigation on a randomly chosen sample of high school students showed a marked association between a preference for rock/metal music and suicidal thoughts, acts of deliberate self-harm, depression, delinquency, drug taking and family dysfunction.<sup>28</sup> The authors suggested that the preference for rock/metal music, particularly in young girls, might be an indicator of vulnerability to suicidal thoughts and actions. These data have been replicated by a US general social survey showing a link between heavy metal fandom and suicide acceptability.<sup>29</sup> Subsequently, a number of authors have reported that metal/rock music preference, suicidal rock music lyrics or videos are all associated with suicide and suicidal ideation.<sup>30–32</sup> A classic example of such vulnerability is the so-called 'Werther effect', following the novel of Goethe, which consists in a duplication or copycat of another suicide that the person attempting suicide knows about either from local knowledge or due to accounts or depictions of the original suicide on television and in other media. The suicide of Kurt Cobain raised immediate concerns among suicidologists, and the public at large, about the potential for his death to spark copycat suicides, especially among vulnerable youth.<sup>33,34</sup>

### **Conclusions**

It is concluded from the above literature and biographical review that if there is a link between musical composition and psychopathology it is through cyclothymia and bipolar disorder. However, it is also clear that not all people with bipolar disorder are creative, and neither are all poets or musicians cyclothymics. What is most important to note is that there are no clear biographies of musicians with a diagnosis of schizophrenia.

It is of considerable interest that biographical studies of poets reveals the same picture, namely an overrepresentation of bipolar/cyclothymic disorders and little evidence of schizophrenia.<sup>4,11</sup> It is possible that the breakdown of communication occasioned by the progression of schizophrenic symptoms is incompatible with creativity, at least for poetry and music. This may seem an unfashionable view, and there are some who may see such disorders as schizophrenia in a more romantic light. However, the biographical evidence does not support such theories. Studies of creative individuals in other areas, such as painting or mathematics or even philosophy, may yield different associations.

From a neurobiological perspective, the association between music and mood disruption would be in keeping with a possible involvement of the right hemisphere since patients with

cyclothymia or bipolar disorders are more likely to reveal changes or pathology of the non-dominant hemisphere.<sup>35–37</sup> All these data suggest that the non-dominant hemisphere plays the active role in the experience (Erlebnis) of music (and poetry), and in the same way that the dominant hemisphere modulates propositional language, the non-dominant facilitates the former, not so much through providing some sort of ‘creative energy’ as mood accelerates, but by its very properties. The over-representation of poets and musicians with mood disorders, and the link of mood disorders to the non-dominant hemisphere reveal much about the latter in driving human creativity and social cohesion.

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