

Press Release: European College of Neuropsychopharmacology

“Magic mushroom” anti-depressive psychedelic affects perception of music

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Type of study: not peer reviewed/experimental study/human subjects

Scientists have found that the psychedelic drug psilocybin, in development as an anti-depressive treatment, changes the emotional state of people listening to music. Psilocybin is the active psychedelic ingredient in ‘magic mushrooms’. Clinical trials of psilocybin generally use selected music playlists to support the drug-induced psychedelic experience, and this work shows that enhanced emotional processing may be a positive outcome of combining psilocybin with music, suggesting that music should be an active component of psilocybin therapy. This work is presented at the ECNP Congress in Lisbon.

There has been considerable interest in the use of psychedelics in the treatment of hard-to-treat depression and other mental health conditions. Psilocybin, found naturally in several species of mushrooms, is the psychedelic most suitable for clinical development, in part because the psilocybin ‘trip’ can be contained within a working day, which is important for a supervised clinical treatment. In the treatment of depression, psilocybin is normally administered with psychological support, and with accompanying music. Previous studies have shown that the psychedelic LSD interacts with music*, and of course in the 1960’s psychedelics were intimately related to the experience of music for many. Now for the first time a group of Danish scientists have shown that psilocybin affects the way that music elicits emotions.

In the study, 20 healthy participants (50% women) were tested on their emotional response to music before and after given psilocybin; 14 of these participants were also tested after being given ketanserin (ketanserin is an anti-hypertension drug, commonly used to as a comparison in psychedelic experiments). Whether ketanserin or psilocybin was given first was randomly selected and each person was thus able to report on the changes effected by both psilocybin and ketanserin. At the peak of drug effects participants listened to a short music programme and rated their emotional response.

The emotional response to the music was rated according to the Geneva Emotional Music Scale. The music used was a short programme comprising Elgar’s Enigma Variations no 8 and 9, and Mozart’s Laudate Dominum, together lasting around 10 minutes.

According to lead researcher, Associate Professor Dea Siggaard Stenbæk (University of Copenhagen):

“We found that psilocybin markedly enhanced the emotional response to music, when compared to the response before taking the drugs. On the measurement scale we used, psilocybin increased the emotional response to music by around 60%. This response was even greater when compared to ketanserin. In fact, we found that ketanserin lessens the emotional response to music. This shows that combination of psilocybin and music has a strong emotional effect, and we believe that this will be important for the therapeutic application of psychedelics if they are approved for clinical use.

Psilocybin is under development as a drug to treat depression, and this work implies that music needs to be considered as a therapeutic part of the treatment.

Our next step is to look at the effect of music on the brain while under the influence of psilocybin in data material we have already collected, using an MRI”.

She continued:

“Interestingly, some of the music we used, Elgar famous ‘Nimrod’ variation (the 9th variation) describes his close friend Augustus Jaeger. Jaeger encouraged Elgar to write the variations as a way out of depression, so we’re pleased to see it used again to help understand more about mental health”.

Commenting, Professor David J Nutt (Imperial College, London) said:

“This is further evidence of the potential of using music to facilitate treatment efficacy with psychedelics. What we need to do now is optimise this approach probably through individualising and personalising music tracks in therapy”.

This is an independent comment; Professor Nutt was not involved in this work

There is evidence that Magic mushrooms have been taken by humans for over 6000 years. Psilocybin was first isolated and synthesised in 1958, by the Swiss Chemist Albert Hoffman, the same man who first synthesised LSD. There was extensive early research into medical uses of psychedelics, but this became difficult after the US introduced a ban on their use in 1970.

<https://www.scientificamerican.com/article/end-the-ban-on-psychoactive-drug-research/> for background.

*See: LSD enhances the emotional response to music, Kaelen et al, *Psychopharmacology* 232, 3607–3614 (2015).

<https://link.springer.com/article/10.1007/s00213-015-4014-y>

The 34th ECNP Annual conference takes place in Lisbon and online from 2-5 October, see <https://www.ecnp.eu/Congress2021/ECNPcongress> . The European College of Neuropsychopharmacology is Europe’s main organisation working in applied neuroscience.

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Notes for Editors

Conference Abstract: P.0828 Psilocybin enhances emotional response to music in healthy individuals

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Background: Psilocybin is a serotonergic psychedelic which produces its profound effects on consciousness primarily as a serotonin 2A receptor (5-HT_{2A}R) agonist[1]. Music is considered integral to the administration of psychedelics and is used to provide support in altered states of consciousness[2]. Retrospectively reported experiences with music during psilocybin-assisted antidepressant treatment have been associated with positive treatment outcome[3], suggesting that music contributes to clinical effects although the processes involved are not clear. Music can evoke a variety of emotions and previous experimental work with lysergic acid diethylamide (LSD) suggests that this emotional response may be enhanced by 5-HT_{2A}R agonism[4], implicating emotional processing as a synergetic interface between music and psychedelics. However, it is not known whether emotional response to music is enhanced with psilocybin or reduced by 5-HT_{2A}R antagonism. In this study we

therefore sought to elucidate the effects of intervention with psilocybin as compared to intervention with the 5-HT2AR antagonist ketanserin on emotional response to music. For this purpose, we chose an excerpt of the classical music program Positive Affect used to facilitate emotional experiences within traditional music therapy.

Methods: We included 20 healthy individuals (10 women) with a mean age of 33 years (range: 24-58) in this randomized (psilocybin or ketanserin first) cross-over, single-blinded study. Participants received 0.3mg/kg of psilocybin or 20mg of ketanserin (n=14) on two separate intervention days. At baseline and during the period of peak drug levels, participants listened to the music program and reported their emotional response to the music immediately afterwards using the 9-item Geneva Emotional Music Scale (GEMS)[5]. The music program included Edward Elgar, Enigma Variations no. 8 and 9 and Amadeus Mozart, Laudate Dominum (app. 10 minutes). Differences in GEMS total score between psilocybin and baseline (n=20), psilocybin and ketanserin (n=14), and ketanserin and baseline (n=14) were evaluated using paired-samples t-tests. Effect sizes are reported with Hedge's g and p-values are corrected using the Bonferroni-Holm method.

Results: Psilocybin significantly increased GEMS compared to baseline ($\Delta\text{GEMS}_{\text{Psi-Base}}$ [95% CI], p-value, Hedge's g: 19.6 [8.8; 29.5], $p_{\text{corr}}=0.003$, $g=0.9$), and compared to ketanserin ($\Delta\text{GEMS}_{\text{Psi-Ket}}$: 35.5 [20.1; 50.9], $p_{\text{corr}}=0.002$, $g=1.5$), while ketanserin decreased GEMS compared to baseline ($\Delta\text{GEMS}_{\text{Ket-Base}}$: -10.5 [-19; -2], $p_{\text{corr}}=0.02$, $g=-0.8$).

Conclusion: We found that psilocybin markedly enhanced the emotional response to music in healthy individuals, both as compared to baseline and ketanserin. Interestingly, ketanserin decreased the emotional response to music as compared to baseline, suggesting a modulating role of 5-HT2AR in music-evoked emotions. These findings add to our empirical knowledge about the interplay between psilocybin and music in shaping the intense emotional states typical of psychedelic phenomenology. Insights such as these are critical for more effectively leveraging the clinical potential of music, e.g., prepare and integrate psychedelic sessions through music listening aimed at increasing emotional awareness. Understanding the contribution of enhanced music-evoked emotions to other prototypical psychedelic phenomena, e.g., mystical type experiences, will also be important for establishing music as a key element in psychedelic therapy.

References

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