

Altered temporality and acoustic perception under the influence of THC

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BACKGROUND AND AIMS

Attention focus and according working memory load seem to modify the experience of temporality (Pöppel, 2000). This may reflect the consciousness state of a subject and its cognitive and attentional behaviour during state-related timing processes (Jörg Fachner, 2009).

The mechanisms behind altered temporality remain unclear. Drug-induced altered temporality is a well-known effect of cannabis action that is utilised from musicians and music listeners for music appreciation since the early days of jazz (J. Fachner, 2000; Sloman, 1998) and calls for scientific explanation. Cannabis is reported to be ‘used creatively’ for free musical activities like improvising but can hinder exact playing i.e. of sheet music in an orchestra or big band as well (Behrendt, 1956). Today, drug use and a referential sound design in popular music are part of popular culture (J. Fachner, 2007; Manning, 2007; Whiteley, 1997).

METHOD

This poster will focus on cannabis and its action on timing and aims to discuss selected scientific streams of research on the neurophysiological and neuropharmacological base of timing mechanisms in terms of a social pharmacology of music (J. Fachner, 2010).

RESULTS

Cannabis has an influence on timing processes at short time scales of hundreds of milliseconds as O’Leary et al (2003) have shown in their tapping studies, proving evidence of an altered cerebellar functioning.

For interval timing, task-related and activated neural networks (discussed are thalamo-cortico-striatal circuits, i.e. basal ganglia, supplementary motor cortex, prefrontal cortex, posterior parietal cortex) are serving as a timekeeper and are detecting coincidences in synchronous brain activation and processing of different neural populations. “The scalar property derives from the assumption that that the accumulation error is proportional to the criterion duration” (Buhsu & Meck, 2005, p. 756) and this may reflect the consciousness state of a subject and its cognitive and attentional behaviour during time processes in state-related accumulation processes (Jörg Fachner, 2009; J. Fachner, 2010; Globus, Cohen, Kramer, Elliot, & Sharp, 1978).

Clock speed (pacemaker) can be influenced by dopaminergic manipulations whereas memory processes (reference) can be influenced by cholinergic manipulations. Lieving explains the role of THC in timing as an acceleration of clockspeed mediated via an increase in activity of dopaminergic neurons, while the anticholinergic action of THC expands the duration of a remembered event. „The more acetylcholine is present, the shorter the remembered duration of events.“ (Lieving, Lane, Cherek, & Tcheremissine, 2006, p. 182).

CONCLUSIONS

The change of the scalar property of auditory events may lead to a change in the metric frame of reference when perceiving acoustic and spatial relations and seemed to inspired sound design in popular music. Cannabis induced reframing of acoustic events may be of benefit for people with hearing impairment (J. Fachner, 2000, 2002a, 2002b, 2003).

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TOPIC AREAS

Music and Pharmacology
Rhythm, meter and timing
Acoustics and Psychoacoustics