

# **Effects of music and alpha-wave frequencies on meditation**

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Meditation and music are usually performed together. In many cases music is the background of meditation. Thus, the question arises whether music has a positive effect on meditation. This master thesis delves with the assumptions that music 1) enables more rapid entry into a meditative state, 2) makes it easier to enter a meditative state and 3) makes the perception of a meditative state more intense. Alpha waves (8-12Hz) are representative for a meditative and relaxed state. As a consequence, we will test whether alpha frequencies (8-12Hz) played via headphones are triggering a meditative state. The assumption is that frequencies in the range of alpha waves are able to provoke or strengthen the production of alpha waves in the brain and therefore a meditative and relaxed state. In the first exploratory part of this study, results will be obtained in a within-subject design based on rating scales. The second part of this study depends on the first part and will be based on electroencephalography (EEG)-, heart rate variability (HRV)- and respiratory rate (RR)- measurements. The first part of this study will comprise four conditions: 1) no music, 2) stressful music, 3) (relaxing) meditation music and 4) frequencies in the range of 8-12 Hz. In every condition the participants will have to meditate while listening to music (or no music) via headphones. Participants will be divided into two groups: 1) experienced meditating persons and 2) non-experienced meditating persons. After every condition they will have to rate on a rating scale from 1 to 7: 1) how fast they think they experienced a meditative state 2) how easy it was to experience a meditative state, and 3) how intense they perceived a meditative state. Statistical analyses will consist of analysis of variance (ANOVA) of these dependent variables. In case it is possible to induce the production of alpha waves or relaxation, this will be of great benefit for science and medicine, because on the one hand it would be easier to have totally relaxed participants in EEG- studies and on the other hand people would be able to relax whenever and wherever.

Keywords: meditation, music, alpha, electroencephalography, heart rate variability