

研究業績 英文表記

和文	
表題	集中力課題実施時の脳活動に対するコーヒーの香りの影響
著者名	松尾萌美 ¹ , 一番ヶ瀬太陽 ¹ , 陶山暉 ¹ , 高原瑠菜 ¹ , 樋口隆志 ²
所属	¹ 西九州大学, ² 大阪人間科学大学
英文	
Title	Effect of Coffee Aroma on Cerebral Activity during Concentration Tasks
<u>Author</u>	Moemi Matsuo ^{1*} , Taiyo Ichibakase ¹ , Hikaru Suyama ¹ , Runa Takahara ¹ , Takashi Higuchi ²
Affiliation	¹ Nishikyushu University, ² Osaka University of Human Sciences
Abstract	<p>Background/Objectives: Caffeine has been shown to reduce various health risks, such as diabetes, obesity, and vascular diseases, and it may provide health benefits when consumed in moderate amounts, such as three to four cups per day. However, caffeine may exhibit harmful effects depending on the dose. Although the health benefits and disadvantages of caffeine intake have been studied, the effects of caffeine’s aroma have hardly been studied. This study aimed to examine the impact of caffeine scent on brain activity during cognitive tasks using electroencephalography (EEG).</p> <p>Methods: This study included 30 healthy young adults. We investigated cerebral activity using EEG during the concentration tasks. Participants performed tasks under pre- and post-conditions, including drinking coffee, smelling coffee, or drinking water. The number of correct responses and reaction times were calculated for each task, and mean power levels were analyzed. A linear mixed model was applied with “performance”, “ROI”, and “wave band” to examine the effects of conditions and timing.</p> <p>Results: Significant differences were observed in left-frontal θ power (coffee < smell and water) and in right-frontal α power (coffee < smell) during the post-task phase ($P < 0.05$). No significant differences were observed during the pre-task phase between conditions. Also, there were significant differences in left-occipital θ between pre- and post-task during water conditions (pre < post). Although there was a trend toward improved correct performance reactions, this was not statistically significant.</p> <p>Conclusions: Lower α on the frontal lobe and higher θ are associated with improved arousal and cognitive functions. Drinking coffee reduced α power, whereas smelling coffee or drinking water increased θ power. Therefore, drinking coffee, smelling coffee, and drinking water may affect cerebral activities and enhance cognitive performance.</p>
keyword	Coffee, Caffeine, Concentration, Electroencephalography, Brain Function, Neuroimaging

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