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LATE-BREAKING POSTER SESSION III-128 |

3-D VR TRAINING MODULATES N2PC AND CDA ERP COMPONENTS IN VISUAL SELECTIVE ATTENTION AND WORKING MEMORY TASKS

Roman Rosipal[1,2], Leonardo Trejo[1], Štefan Korečko[3], Barbora Cimrová[2], Igor Farkaš[4]
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We measured the effects of virtual reality (VR) training on the N2 posterior contralateral (N2pc) and contralateral delay activity (CDA), event-related potential (ERP) components associated with visual selective attention and working memory. Thirty participants engaged in a 3-D VR environment developed for game-like training. The training (10 sessions) was designed to improve visual working memory by enhancing the ability to filter relevant from irrelevant visual stimuli. After five and 10 trainings, each participant in the VR group completed a change detection task (CDT) using a 2-D computer screen. Fifteen control group participants performed CDT only, without training between the CDT tests. In both groups, the CDT's stimulus set size was two or four target objects with zero or two distractors. The N2pc and CDA differences related to the CDT load were visually analyzed and formally tested with repeated measures of analysis of variance. The relation of the neurophysiological results with the behavioral results, including accuracy and reaction times, was also analyzed. Although formal statistical testing did not find a significant difference between the trained and control groups when analyzing least mean square estimates, a considerable effect indicating improved filtering was observed. A significant non-zero difference at the level of several tenths of μV was observed when comparing a CDA difference between trials with and without distractors after ten days of training versus an initial before-training difference. In the control group, no significant change was observed.

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Topics: 1.1 Human Studies: General Population - Adults, 2.1 Neuroimaging (EEG, fMRI, fNIRS etc.), 3.1 Observational Study: Cross-Sectional, 4.18 Memory, 4.20 Attention, 4.22 Learning/conditioning

~~LATE-BREAKING POSTER SESSION III-129 |~~

~~## HIPPOCAMPAL VOLUME IS ASSOCIATED WITH ANXIETY BEFORE AND AFTER, BUT NOT DURING THE COVID-19 PANDEMIC~~

~~Anna Finley[1], Emily Urban-Wojcik[2], Lauren Gresham[3], Elizabeth Nord[3], Sarah Skinner[3], Alexandra Barnes[4], Richard Davidson[3], Stacey Schaefer[3]~~
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~~The hippocampus is implicated in stress and emotional processes, with smaller volumes associated with increased risk for psychopathologies. However, it is unclear how hippocampal volume measured prior to a major societal stressor is related to emotional responses during the stressor and years following the event. We examined this in $n = 57$ ($m_{age} = 40.4$, $sd_{age} = 13.1$, 85% White, 67% female) participants who completed questionnaires and a structural MRI scan before the COVID-19 pandemic and a subset of participants who completed questionnaire follow-ups at the height of the pandemic (October 2020; $n = 43$; $m_{age} = 40.1$, $sd_{age} = 12.4$, 81% White, 63% female) and after pandemic stressors waned (May 2022; $n = 41$; $m_{age} = 41.7$, $sd_{age} = 13.3$, 88% White, 61% female). Larger pre-pandemic hippocampal volumes were significantly related to less pre-pandemic anxiety symptoms assessed with PROMIS Anxiety CAT ($p = 0.018$) and with less post-pandemic anxiety symptoms (2022; $p = 0.019$), but were unrelated to anxiety symptoms assessed during the pandemic (2020; $p = 0.901$). Instead, anxiety symptoms during the pandemic were significantly associated with overall pandemic distress ($p < 0.001$). This suggests that hippocampal volume is associated with anxiety in periods of normal stress (pre-pandemic) and after periods of extreme stress (2022), but are unrelated to anxiety symptoms during periods of extreme stress (2020).~~

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~~*Topics: 1.1 Human Studies: General Population - Adults, 2.1 Neuroimaging (EEG, fMRI, fNIRS etc.), 2.11 Questionnaires/ Interviews, 3.2 Observational Study: Longitudinal, 4.7 Psychopathology, 4.10 Stress, 4.23 Emotion/affect*~~