



# Adverse sensory input of the abuse modified by early experience

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Childhood maltreatment, which markedly increases the risk of psychopathology, is associated with structural and functional brain differences. Especially, exposure to parental verbal abuse (PVA) or interparental violence during childhood is associated with negative outcomes such as depression, PTSD, and reduced cognitive abilities. Other forms of childhood abuse have been associated with brain structure or developmental alteration. Our earlier studies elucidated potential discernible effects on the brain morphology of PVA and witnessing domestic violence during childhood on the gray matter volume or cortical thickness. Brain regions that process and convey the adverse sensory input of the abuse might be modified specifically by such experiences, particularly in subjects exposed to a single type of maltreatment. Exposure to multiple types of maltreatment is more commonly associated with morphological alterations in corticolimbic regions. These findings are consistent with preclinical studies showing that sensory cortices are highly plastic structures.

Using a whole-brain voxel-based morphometry approach, structural images were analyzed while controlling for age, sex, full scale IQ, and the total brain volume to elucidate whether reactive attachment disorder (RAD) was associated with alterations in the gray matter volume (GMV) in children and adolescents. A significantly reduced GMV in the left primary visual cortex (Brodmann area 17) was observed in the RAD group compared to the typically developed group. This GMV reduction was related to an internalizing problems measure of the Strength and Difficulties Questionnaire. The visual cortex has been viewed as a part of the neurocircuit regulating a stress response to visual stimulus-induced emotions. These visual cortex GMV abnormalities may also be associated with such visual stimulus-induced emotion regulation impairments of RAD, leading to an increase in the risk of future psychopathology.

Date: **Friday December 11<sup>th</sup>**

Time: **3.00pm to 4.00pm**

Venue: **Room C700, Lab 3, OIST Graduate University**