Loss of Action-related Function in The Blind Extrastriate Body Area

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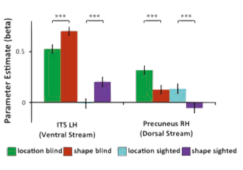
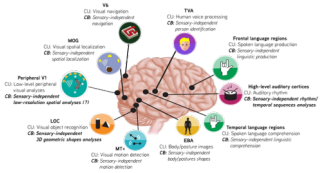
Introduction

Retention of visual streams



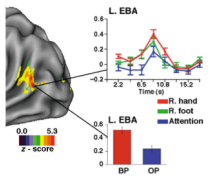
Striem-Amit et. al., 2011

Task Specific Sensory Independent



Heimler & Amedi, 2020

EBA responds to movements



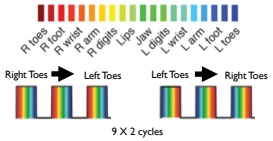
Astafiev et. al., 2004

Methods

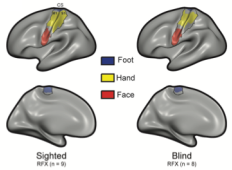
Experiment 1

Active unilateral movements

8 congenitally blind
9 healthy sighted



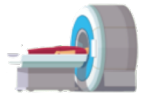
Somatotopic preference



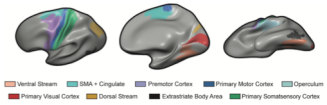
Experiment 2

Resting state functional scan

9 congenitally blind
20 healthy sighted

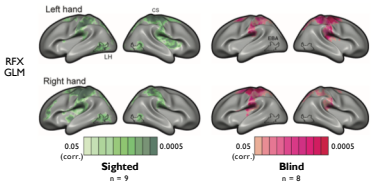


Connectivity ROIs

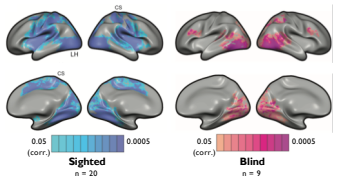


Results

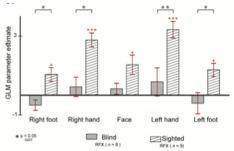
EBA' responds to movements in the sighted but not in the blind



EBA's resting state connectivity is less expansive in the blind brain



EBA ROI analysis

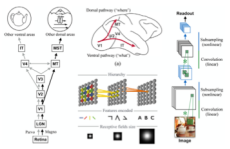


Congenital blindness alters the EBA's connectivity profile

Discussion

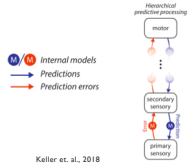
- Vision is crucial for the development of the action-related function of EBA
- From a predictive processing standpoint, EBA can be seen as an important site for generating predictions (models) and for calculating errors
- EBA could be superseded by other areas (presumably parietal cortices) in the blind that are closer to somatosensory inputs, and thus more computationally efficient

Feedforward connections



Medathati et. al., 2016

Predictive processing



Keller et. al., 2018