Microstructural proliferation in human cortex is coupled with the development of face processing

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Abstract:

How does cortical tissue change as brain function and behavior improve from childhood to adulthood? By combining quantitative and functional magnetic resonance imaging in children and adults, we find differential development of high-level visual areas that are involved in face and place recognition. Development of face-selective regions, but not place-selective regions, is dominated by microstructural proliferation. This tissue development is correlated with specific increases in functional selectivity to faces, as well as improvements in face recognition, and ultimately leads to differentiated tissue properties between face- and place-selective regions in adulthood, which we validate with postmortem cytoarchitectonic measurements. These data suggest a new model by which emergent brain function and behavior result from cortical tissue proliferation rather than from pruning exclusively.

Journal:

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