

## Selectivity of face perception to horizontal information over lifespan (from 6 to 74 year old)

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Face recognition in young human adults preferentially relies on the processing of horizontally oriented visual information. The present study addressed whether tuning to horizontal information is modulated by the extensive experience that humans acquire with faces over the lifespan, or whether it reflects an invariable prewired processing bias for this visual category.

We tested 282 subjects aged from 6 to 74 years in a face matching task designed to achieve above chance-level performance across ages. Stimuli were upright and inverted faces filtered to preserve information in the horizontal (H), vertical (V) or both (HV) orientation ranges. The engagement of face-specific processing was inferred by comparing matching performance with upright and inverted faces (i.e., face inversion effect, FIE). The FIE was significant in HV and H conditions only, replicating previous evidence that face-specific processing is selectively related to horizontal information handling. Overall, the magnitude of the FIE significantly increased from 6 to 18 years, corroborating the view that face-specific processing is a late-maturing process. We also found that the FIE-size in HV and H correlated with age as the RT difference between upright and inverted conditions tended to increase linearly as a function of age. In contrast, the FIE-size in V condition was not modulated by age.

These findings indicate that face-specific processing is modulated over the lifespan by the extensive experience humans acquire at extracting the visual cues located in the horizontal orientation band of upright face images. We corroborate the view that the development of face perception reflects the refinement of visual mechanisms that are specifically engaged for faces. We also confirm that facespecific processing is tightly linked to the encoding of information carried by a range centered on horizontal orientation.

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