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Tolerance of the ERP Signatures of Unfamiliar versus Familiar Face Perception to Spatial Quantization of Facial Images

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ABSTRACT

Processing of faces as stimuli is known to be associated with a conspicuous ERP component N170. Processing of fa-miliar faces is found to be associated with an increased amplitude of the ERP components N250r and P300, including when a subject wishes to conceal face familiarity. Leaving facial images without high spatial frequency content by low pass spatial filtering does not eliminate face-perception signatures of ERP. Here, for the first time, we tested whether these facial-processing ERP-signatures can be recorded also when facial images are spatially quantized by pixelation, a procedure where in addition to impoverishment of face-specific information by spatial-frequency filtering a competing masking structure is generated by the square-shaped pixels. We found dependence of N170 expression on level of pixelation and P300 amplitudes dependent on familiarity with 21 pixels-per-face and 11 pixels-per-face images, but not with 6 pixels-per-face images. ERP signatures of facial information processing tolerate image degradation by spatial quantization down to about 11 pixels per face and this holds despite the subject's wish to conceal his or her familiarity with some of the faces.

KEYWORDS

Face Recognition, Spatial Quantization, N170, P300, Deception

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