



## Automatic affective evaluation of visual symmetry

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It is possible that the neural mechanisms that detect symmetry are linked to those that produce positive affect. We conducted a set of behavioural and electrophysiological studies designed to investigate the nature of this putative connection. First, we used the Implicit Association Test (IAT) to measure implicit preference for visual regularity. On some trials, participants saw symmetrical or random dot patterns. On interleaved trials, they saw positive or negative words. When the same button was used to report symmetrical patterns and positive words, response times were faster than when the same button was used to report symmetrical patterns and negative words. This classic IAT effect demonstrated an implicit preference for symmetry. In further experiments, the same procedure was used to record implicit preference for reflection over other types of regularity, such as translation or rotational symmetry. Second, we simultaneously recorded EEG and EMG from the same participants while they observed reflection or random dot patterns. Contrary to previous findings, we found that early visual components (P1 and N1) were modulated by symmetry. Moreover, there was increased activity in the Zygomaticus Major (the muscle responsible for smiling) when participants viewed reflectional symmetry, indicating a positive affective response. Rotational symmetry produced different ERPs, and no affective response. Together, our data suggest that, once the patterns are attended, most participants spontaneously form a preference for reflectional symmetry, even in the absence of any explicit instruction to engage in aesthetic evaluation.

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