

Abstract

Visual ability is not equal across the visual field but instead varies in characteristic ways. For example, tasks that measure low-level vision, such as letter acuity or orientation judgements, reveal superior vision in the lower compared to the upper half of the visual field (upper-lower anisotropy). Recent research suggests that face perception may not show the same pattern of anisotropies, with variations that are instead specific to each individual. This study aimed to bridge the gap between these variations in low and high-level vision by measuring acuity for judging facial gender in different regions of the visual field. Participants reported the gender of upright or inverted faces that appeared at 8 locations in the periphery (at 10° eccentricity). Face size was varied on each trial according to a QUEST procedure, with acuity thresholds calculated as the smallest size necessary to judge gender at each location. Results show that for both upright and inverted faces, performance was better in the lower compared to the upper half of the visual field, and along the horizontal (East and West combined) compared to the vertical (North and South combined) axis. These variations in gender acuity align with those found for simpler tasks (e.g. orientation discrimination), providing a direct link between low and high-level vision. Inversion effects were found at all locations and were greater along the horizontal compared to the vertical meridian. These common anisotropies challenge the current literature by showing that recognition of facial gender differs across the visual field in ways analogous to low-level vision. This ties in with a hierarchical model of face recognition, whereby face-selective brain regions inherit the spatial properties of earlier visual areas (e.g. the same resolution patterns) when building complex face representations.

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