The contribution of distinctive features to cost-efficient facial representations

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People know thousands of faces (Jenkins et al., 2018) despite inherent human memory limitations. The content of memory representations needed to recognise new facial exemplars of so many individuals successfully remains unclear. The cost-efficient encoding theory (Devue & de Sena, 2023) postulates that representations incorporate information diagnostic to individual faces, following a coarse-to-fine trajectory. This process would depend on intrinsic facial characteristics, such as their relative stability over time. Accordingly, we showed that representations of faces with stable looks refine less over time than representations of faces with variable looks. Here, we tested the impact of another intrinsic facial factor on the robustness of facial representations, namely the presence of distinctive features. If cost-efficient encoding processes apply, distinctive features should receive more representational weight than typical ones, creating robust but skewed representations. To test this hypothesis, we selected 20 actors with distinctive features in the bottom or the top part of the face and 20 actors with no distinctive features, all presented in a recognition task amongst 40 foils. In different conditions, the bottom or the top part of the faces were occluded (i.e. with FFP2 mask or ski goggles). We predicted that when visible, distinctive features would have a protective effect from occlusions, but that occlusions of distinctive features would be more detrimental than that of typical features. We will discuss the relevance of the results for human face recognition theories and potential applications in automatic face recognition algorithms.