Complex consumer preferences from rudiments of visual processing

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Humans and many other consumer animals such as predators tend to select similar salient, pop-out, resource items from a visual scene. This observation hints at a common, simple mechanism underlying visual attention and driving the evolution of visual apparatus. Using simple artificial neural networks, we demonstrate that when information degrades early in a neural apparatus, and this degradation is compensated for in higher layers, many of the distinctive behaviours of consumer organisms emerge. These include preference for odd-looking resource items, resources that are spatially isolated, and resources that are on the edge of groups. We also observe evolution of a primitive visual fovea. While visual attention is structurally and mechanistically complex in humans, the fundamental mechanisms driving the evolution of visual apparatus across different animal species may be simpler.