

Recruitment of new visual cues for perceptual appearance

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The visual system constructs visual appearances to represent various properties of attended, visible objects. “Cue theory” is the old name for the accepted framework for understanding appearance: objects give rise to informative patterns in the optic array that can be described with simple (low dimension) statistics; these patterns or “cues” are then measured by the visual system and used to recover the properties of the objects. To be optimal the visual system must make full use of the available cues, which predicts that the system should recruit new cues if the environment changes such that some new statistic becomes a reliable indicator of a represented object property. New cues are in fact recruited by the system although study of this process has only just begun. Cue combination experiments suggest that, by default, the system assumes that a newly discovered cue is conditionally independent from long trusted cues that tell about the same object property. The hallmark of appearance as a form of mental representation is its accessibility to conscious introspection, but only some visually guided behaviors are mediated by appearance. It is therefore important to identify methods for studying appearance per se. Perceptually bistable stimuli are a particularly useful tool for studying cue recruitment and cue combination during the construction of appearance.