

In two experiments, we tested if observers would estimate orientation statistics from a set of stimuli more precisely if stimuli are arranged in a simple pattern rather than positioned randomly. We used an explicit and an implicit procedures to test the effect of spatial organization. With the explicit procedure, observers judged the average orientation of a set of lines in a 4-AFC task. With the implicit procedure, we tested how well participants can learn the distribution of distractors' orientation in an odd-one-out visual search. Preliminary results suggest that spatial uncertainty does not affect explicit judgments but might affect the representation of orientation distribution obtained with implicit procedure.

Peripheral Vision

Emergence of a Hierarchical Structure in the Neural Representation of Visual Objects in the Rat

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Rats are gaining prominence as models of the mammalian visual system, thanks to their experimental accessibility. Recent works have shown their ability to invariantly recognize visual objects undergoing identity-preserving transformations. Neurophysiological measures suggested that the low-level information is progressively skimmed while moving upwards in their visual hierarchy. To investigate more in depth such organization in terms of neural representations of visual objects, we recorded the neural activity from rat primary visual cortex and three extrastriate areas during passive visual exposure to a rich stimulus set designed to explore a large space of visual features and transformations. The neural activations were characterized through clustering, dimensionality reduction and information theory techniques, revealing a progressive increase in the complexity of the visual features processed along the visual pathway.

Encoding Perceptual Ensembles During Visual Search in Peripheral Vision

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Observers can learn complex statistical properties of visual ensembles, such as the shape of their underlying distributions. Even though ensemble encoding is critical for peripheral vision, distribution shape learning in the periphery has not been studied. Here, we investigated this using a visual search task, in which observers looked for an oddly oriented bar among distractors taken from either uniform or Gaussian orientation distributions with the same mean and range. The search array was presented either in the foveal or peripheral visual field. Surprisingly, our results indicated that search performance was better in the periphery, but little, or no distribution learning effects were observed across display locations, possibly because the search arrays were presented briefly (250 milliseconds) to prevent eye movements. Given the importance of crowding and texture perception for peripheral vision, these results suggest an interesting interaction between those and ensemble encoding.

Auditory Cue Suppresses Visual Detection in Extreme-Periphery

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Several studies found cross-modal cueing can enhance perceptual tasks; visual stimulus, for example, can be better detected with auditory cue than without it. Most studies, however, focused on a target within foveal or peripheral visual field (e.g., 20°–50° eccentricity). Neurological and behavioral studies showed auditory can complement visual perception in the periphery, but such cross-modal cueing in the extreme-periphery has been unexplored. In the present study, participants detected a dot appeared randomly in either left/right extreme-periphery (from 60° to 90°, with 5° distance). In a half of the trials, the dot was presented with a simultaneous beep as an auditory cue. The results counterintuitively indicated that auditory cue significantly decreased the visual detection in the extreme-periphery. Further pilot study implied auditory cue may be more reckoned on with widespread visual attention and produced false alarms, resulting decreased sensitivity in the extreme-periphery.

41st European Conference on Visual Perception (ECVP) 2018 Trieste

Perception
2019, Vol. 48(S1) 1–233
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DOI: 10.1177/0301006618824879
journals.sagepub.com/home/pec



Welcome Address

The 41st European Conference on Visual Perception (ECVP) took place in Trieste (Italy), from August 26 to 30, 2018. This edition was dedicated to the memory of our esteemed colleague and friend Tom Troscianko, with an emotional Memorial lecture in his honour held by Peter Thompson during the opening ceremony.

The conference saw the participation of over 900 fellow vision scientists coming from all around the world; the vast majority of them actively participated, allowing us to offer an outstanding scientific program. In particular, we hosted almost 300 oral presentations in 21 symposia and 21 talk sessions, and more than 500 posters during the innovative ‘Poster day’. Among symposia, there were two special ones: the European Symposium on Perception and Action in Sport (ESPAS), gathering the most influential researchers in the field, and *Perceptual Structures – A Festschrift for Michael Kubovy*, celebrating his retirement. As concerns keynotes, the Perception lecture was held by Dejan Todorović, while the Rank Prize lecture was held by Branka Spehar; moreover, in the program we also included the Kanizsa lecture, held by Walter Gerbino. Finally, we respected the tradition of the Illusion night, this year entitled “Un mare di illusioni” as it took place by the sea.

To conclude, we sincerely thank all the volunteers, whose contribution was fundamental for the success of the conference.

The ECVP 2018 organising committee

Tiziano Agostini, Paolo Bernardis, Carlo Fantoni, Alessandra Galmonte, Mauro Murgia and Fabrizio Sors

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