

UC Irvine

UC Irvine Previously Published Works

Title

Binary versus graded filters for selectively attending to dots of different contrasts

Permalink

<https://escholarship.org/uc/item/7hk355xb>

Journal

Journal of Vision, 8(6)

ISSN

1534-7362

Authors

Drew, SA
Chubb, CF
Ehrlich, T
[et al.](#)

Publication Date

2010-04-02

DOI

10.1167/8.6.881

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

Binary versus graded filters for selectively attending to dots of different contrasts

[Stefanie A. Drew](#); [Charles F. Chubb](#); [Tobin Ehrlich](#); [Tim Rubin](#); [George Sperling](#)

+ Author Affiliations

Journal of Vision May 2008, Vol.8, 881. doi:<https://doi.org/10.1167/8.6.881>

Abstract

Previously we established that in estimating the centroids of sparse dot-clouds, observers are able to apply attentional filters that select dots based on the sign of dot contrast, giving equal weight to all pertinent dots (dots darker than the background, lighter, or all dots). To further investigate these top-down attentional filters, we examined whether they could be made sensitive to contrast amplitude. Participants indicated with mouse-clicks the locations of centroids for briefly flashed, sparse clouds comprising either 8 or 16 dots of various intensities, attending to either (i) dots darker than the background, (ii) dots lighter than the background, or (iii) all dots present, with a variation to our original instructions. Whereas observers previously attempted to weight all pertinent dots equally, in the current study observers were instructed to weight pertinent dots in proportion to their contrast amplitudes, assigning more weight to dots with extreme contrasts. For example, in the attend-to-dark condition, observers were required to estimate the centroid of only the dots darker than the background, giving the greatest weight to black dots, slightly less to dark gray, etc. Three conditions were tested: (i) to find the centroid of only the dots darker than the background, giving the most weight to black dots, (ii) to find the centroid of only the dots lighter than the background, giving the most weight to white dots, and (iii) to find the centroid of all of the dots present, with the most weight assigned to the extreme black and white dots. The observed graded-attention filters differed only slightly from those observed under equal weighting instructions. This suggests that observers do not have access to separate attention filters that operate on a gradient scale.

Drew, S. A. Chubb, C. F. Ehrlich, T. Rubin, T. Sperling, G. (2008). Binary versus graded filters for selectively attending to dots of different contrasts [Abstract]. *Journal of Vision*, 8(6):881, 881a, <http://journalofvision.org/8/6/881/>, doi:10.1167/8.6.881. [[CrossRef](#)]

Footnotes

Research supported in part by Air Force Office of Scientific Research, Life Sciences, Grant FA9550-04-1-0225.