Asymmetric interactions in the processing of the visual dimensions of position, width, and contrast of bar stimuli

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Abstract:

The processing of different dimensions of a single stimulus may be either integral or separable. Dimensions are called integral if correlated variation of one improves discrimination on the basis of the other and random variation of one interferes with discrimination on the basis of the other. For separable dimensions on the other hand, subjects can attend to one dimension and disregard variations in the other. These discrimination tests were used to find the interactions between the processing of the visual dimensions of position, width, and contrast of a light bar stimulus. The relations between these dimensions were found to be asymmetric: judgments of position and width are independent of contrast variations, but variations in these dimensions influence contrast discriminations. Furthermore, position variations influence width judgements more than vice versa. The data were analyzed for repetition effects, and it was found that this model is not sufficient to explain all the interaction phenomena. The asymmetries found may be related to the different ways these dimensions are mapped onto cortical neuron responses.

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