Title: Interference in lateral masking stimuli – The effects of relative phase, position, orientation, and spatial frequency

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Interference in lateral masking stimuli

The effects of relative phase, position, orientation, and spatial frequency

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Short title: Lateral masking

ABSTRACT

Lateral masking has been defined as the perception of a visual target stimulus being impaired when other stimuli are present in its adjacent surroundings. In such cases it has generally been assumed that the target stimulus presented along with a masking stimulus has the same stimulus power as when presented alone and that the reduced visibility reflects interactions in the visual system. It has, however, become clear that there may be interference between such stimuli (Skottun, 2017a, doi: 10.3758/s13428-017-0978-3). Such interference, which takes place in the stimuli and is independent of the visual system, has the potential to reduce the stimulus power of target stimuli. The present report asks, employing 2-Dimensional Gabor functions as stimuli, how interference effects may depend on (1) relative spatial phase, (2) separation between target and masking stimuli, (3) difference in orientation, and (4) difference in spatial frequency between masking and target stimuli. Interference was estimated numerically based on the sums of the amplitudes in the Fourier spectra and the norms of these spectra. Clear evidence for interference was demonstrated with both measures. All the four parameters have the ability to influence the amount of interference. These findings, therefore, emphasize that one cannot count on a target stimulus presented along with masking stimuli to have the same stimulus power as when it is presented by itself.

Key words: 2-Dimensions; stimuli; Fourier; norm; phase; spatial frequency; separation; amplitude; orientation.