A colour-size processing asymmetry in visual conjunction search

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INTRODUCTION

Most present theories of visual search assume that individual features are processed independently prior to an integration stage (e.g. [8, 9]). This assumption is at odds with recent physiological findings suggesting the existence of mechanisms tuned to more than one visual modality [4]. In a previous study, we found psychophysical evidence for a color/orientation dependency in visual search [5]. In the present study, we investigate dependencies in the processing of color and size information.

METHODS & MATERIALS

• Subjects Seven volunteers with normal or corrected-to-normal vision
• Apparatus Macintosh G4, LaCie 22", Matlab 6.5, Psychophysics Toolbox [1], Eyelink Toolbox [2], Eyelink II
• Stimuli Cue (500ms), target and distractors (200ms), mask
• Task Fixate at cue and make saccade to target as quickly as possible
• Procedure 1. Single feature search, 10 contrasts (Fig. 1A)
2. Determine contrasts at which 70% of responses correct (Fig. 2)
3. Single feature and conjunction search with matched contrasts (Fig. 1)

Figure 1: Experiment stimuli (enhanced contrasts)

DATA

Figure 2: Discrimination performance as a function of contrast, 70%-correct thresholds are determined by fitting a sigmoid function to the data

HYPOTHESIS

• Hypothesis At an early stage, color and size information are processed independently
• Test procedure 1. determine perceptually matched color and size contrasts for single feature search
2. use these matched contrasts in a conjunction search task
• Falsification criterion unequal discrimination performance in conjunction search

REFERENCES