THE INFLUENCE OF SEGMENTATION ON RAPID SCENE CATEGORIZATION

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CATEGORIZATION

is fast (Thorpe et al., 1997; Oliva & Torralba, 2001) and can be accounted for by feedforward processing (Serre et al., 2007; Krizhevsky et al., 2012) and therefore, requires no segmentation

HOWEVER,

object surfaces (Nakayama et al., 1995) or proto-objects (Rensink, 2000; Pylyshyn, 2001) has been proposed as a basis for categorization

QUESTIONS

How fast is segmentation computed? Can it occur prior to categorization (at least to some extent)?

DESIGN

IDEA

Manipulate segmentation cues available to participants who are completing a categorization task

IF segmentation influences categorization

THEN segmentation is as fast as categorization, i.e., feedforward

MANIPULATION

Pre-segmentation cues and an occluding bar either support the correct grouping of the image halves or not

Do these cues influence participants?

SETUP

Participants presented with two images of scenes (oriented either vertically or horizontally)
The images were divided in half by an orange occluding bar
Participants were informed that there were only two different images and were asked to report their categories
Thus, the task required to disregard any grouping cues

RESULTS

Experiment 1 Red/blue pre-segmentation cues

Experiment 2 Identical pre-segmentation cues

Experiment 3 No pre-segmentation cue but stimuli slightly tinged

Experiment 4 No pre-segmentation cue

When observers categorize all four images correctly, that means they correctly parsed the display into two vertical or horizontal patches irrespective of segmentation cues

These plots show the proportion of trials they could do so. It is harder to ignore segmentation when it is acting against categorization (i.e., incongruent trials).

CONCLUSIONS

1) Grouping cues can influence scene categorization
2) Some grouping is performed as fast as categorization
3) Compatible with feedforward processes of segmentation
4) Simultaneous grouping and categorization requires stronger cues

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