Title

Difficulty of discrimination modulates attentional capture by regulating attentional focus

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Difficulty of discrimination modulates attentional capture by regulating attentional focus

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Introduction

P3a reflects the neural response regarding attentional capture for deviant events.

Attentional capture for distractor is enhanced by difficulty of discrimination between standard and target in the three-stimulus oddball paradigm.


Purpose: to elucidate the cognitive mechanism of attentional capture modulation.

Hypothesis: attentional capture is modulated by top-down controlled attentional focus.

Attentional focus and cost-benefit

Spatial attention is tightly focused on a selective location to improve stimulus processing.

**BENEFIT:** processing facilitation inside attentional focus

**COST:** processing impairment outside attentional focus

In the difficult task, attention is sharply focused on the central location, and the distractor falls in this attentional focus (A).

>>> Attentional capture enhancement

If so, when distractors are presented in the surrounding location, distractors would fall outside the attentional focus in the difficult task (B).

>>> Attentional capture attenuation

Methods

Participants: 12 students (7m, 5f; 21-26 (M = 23, SD = 1.9) yrs.)

Task: Visual three-stimulus oddball task

To make a quick button press by the right thumb to the target stimuli

Stimuli: Target P3b Amplitude & Latency:

Amplitude: Easy < Difficult (both conditions)

Latency: Easy < Difficult (both conditions)

>> Task difficulty was successfully manipulated.

Distractor P3a Amplitude:

Central condition: Easy < Difficult

Surrounding condition: Easy > Difficult

>> Task difficulty had a contrasting effect on the P3a amplitude between central and surrounding conditions.

Conclusion

Attentional capture for distractor is modulated by top-down controlled attentional focus.

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