The time course of the closure superiority effect: An ERP study

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Introduction
The discrimination of closure is typically faster and easier than that of other geometrical features (Pomerantz, Sager et al. 1977; Treisman and Paterson 1984). However, the time course of the closure-superiority effect is still not clear.

Methods
We recorded event-related potentials (ERPs) during an odd-quadrant task. Subjects were asked to point the odd figure that differed from the rest.

Stimuli: Each trial consisted of a set of four figures. Four groups of well controlled figures were used as stimuli (Chen, 2005). In each group of stimuli, figures differed

- in orientation of angles (A)
- in parallelism (B)
- in collinearity (C)
- in closure (D).

Results

Behavioral results
- The stimulus with closure difference (D) had the shortest Response Time (585.2 ms, F=104.9, P<0.001) and highest Accuracy (99.3%, F=7.64, P<0.001).
- There was no significant difference between the other stimuli.

ERP results

Conclusions
Our results indicate that the closure superiority effect in our brain
- starts around 150 ms (N1) after stimulus onset
- and arrived at the max value at around 400ms (P3)

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References