

# 图形形状和空间位置知觉的ERP研究

饶恒毅、周天罡、卓彦、范思陆、陈霖  
中国科学技术大学北京认知科学开放实验室

研究图形形状和空间位置知觉任务与单纯图形形状知觉任务所诱发的ERP反应,探讨同时注意物体的两种不同特征时与仅注意其中一种特征时的ERP特征与差别。实验结果为:(1)行为数据显示,两种任务的正确率没有显著差别,但形状和空间位置知觉任务的反应时显著低于单纯形状知觉任务;(2)ERP数据显示,两种任务表现出非常相近的ERP波形特征:在大脑后部区域微弱的P1成分,非常显著的N1成分,显著的P2, N2, P3成分;在大脑前部额区显著的P2成分。并且,与单纯形状知觉任务相比,图形形状和空间位置知觉任务表现枕颞区N2波幅的显著减弱, P3潜伏期的显著缩短,额区的P2波幅的显著减弱;(3)脑电地形图与高分辨率断层成像(LORETA)显示,两种任务的特征波N1成分均来源于双侧的枕颞皮层,表明两种任务均涉及到与物体形状识别相关的视皮层腹侧通路,而差别波dN2成分来源于左侧枕颞区,暗示特征加工的差异主要发生在左侧枕颞区。

## ERP STUDIES OF PERCEPTION OF FORM AND SPATIAL LOCATION

The study is aimed to examine ERPs elicited by the perception of form only and of form and spatial location both. The results from 10 subjects show that (1) there is no difference between the correct rate of these two kinds of tasks, but the reaction time of perception of form and spatial location is significantly shorter than that of form only. (2) Compared to the task of form only, the task of form and spatial location shows significantly smaller N2 peak amplitude and earlier P3 peak latency in the occipitotemporal areas, and significantly smaller P2 peak amplitude in the anterior frontal areas. (3) As revealed by the voltage topographic maps and the tomographic mapping (LORETA), the source location of the distinct N1 is in the occipitotemporal areas. It suggests that both tasks involving the ventral pathway related to form and object. Moreover, the source location of the different component dN2 is in the left occipitotemporal area. It suggests that the ERP difference of the two kinds of tasks come from the left occipitotemporal area. The study was also explored the ERPs differences between the attention processing of one feature and two features of an object.

### 关键词

形状知觉(Perception of form only); 形状和空间位置知觉(Perception of form and spatial location); 事件相关电位(Event-related potentials); 源定位分析(Source localization)