

# 视觉空间注意事件相关电位的协同学分析

尹刚、尧德中\*

电子科技大学生命科学与技术学院

在用事件相关电位(event-related potentials, ERP)研究视觉空间注意问题时,直接观察ERP数据就可得出,空间注意的主要作用是对视觉信息处理的调制,它出现在刺激开始后大约80~250 ms,主要表现为枕叶的P1、N1和P2波有明显的增强但它们的潜伏期没有变化。采用基于协同学的时空模式分解方法,把视觉空间注意ERP分解为3个模式成分。结果表明,注意不仅使模式1的第一个正波成分(P11)、第一个负波成分(N11)以及第二个正波成分(P12)增强,还使模式3的第一个正波成分(P31)的潜伏期缩短。用探照灯模型对这些现象作了初步解释,说明该方法是研究注意ERP的一种有潜力的新方法。

## STUDY ON VISUAL SPATIAL ATTENTION EVENT RELATED POTENTIALS BASED ON SYNERGETICS ANALYSIS

It can be derived directly through observing the visual event-related potentials (ERP) data that the main function of spatial attention is the modulation of visual signal processing when the mechanism of visual spatial attention is investigated with ERP. The visual ERPs consisted of several characteristic voltage deflections emerging about 80 ms after the stimulus onset that include the P1 (80~130 ms), N1 (140~200 ms) and P2 (200~250 ms) components. Directing attention to the location of a stimulus typically results in an amplitude enhancement of the P1 and N1 components evoked by that stimulus with little or no change in component latencies or scalp distributions. The spatiotemporal signal decomposition based on synergetic was applied into visual ERP data analysis, three spatial modes were produced, and the results showed that attention not only enhanced the amplitude of the first positive component of model(P11), the first negative component of model(N11) and the second positive component of model (P12), but also shortened the latency of the first positive component of mode3(P31). The searchlight model is adopted here to make preliminary explanation for the results, it shows that the synergetic analysis is a promising method for investigating attention ERP.

关键词