

## 研究论文

### 利用图片命名范式研究双语脑机制

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#### 摘要:

本文对双语图片命名范式下采集的12名被试的脑电数据, 进行事件相关电位(event-related potential, ERP)与标准低分辨率电磁断层成像方法(standard low-resolution electromagnetic tomography, sLORETA)分析。ERP包含大脑后部分布的P1(50~110 ms)与N1(164~200 ms)成分、大脑额叶分布的N2(244~324 ms)及大脑顶部分布的P3(400~600 ms)成分。统计结果表明, ERP各个成分在中文和英文图片命名模式下没有显著性差异。进一步利用sLORETA进行皮层定位, 发现中英文图片命名激活了相同的皮层区域, 但是, 中央后回和缘上回区域的P3成分的激活强度, 在中文命名与英文命名模式下存在显著性差异。研究结果表明, 熟练度不平衡的双语者对于出现频率较高、熟悉、简单的第二语言(L2)词汇的表征, 与第一语言(L1)的表征可能具有相同的皮层机制。

**关键词:** 双语图片命名 事件相关电位 标准低分辨率电磁断层成像

### An EEG Study of Bilingual Brain by Picture Naming Paradigm

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#### Abstract:

EEG data were recorded from 12 subjects under the condition of dual-language picture naming, then, analyzed the data combining event-related potentials (ERP) with the standard low-resolution electromagnetic tomography method (sLORETA). The ERP contains P1 (50~110 ms) and N1 (164~200 ms) over the Occipital, N2 (244~324 ms) over the Frontal and P3 (400~600 ms) over the top region. Statistics suggest that there are no significant differences over all the ERP components between Chinese and English picture naming. sLORETA brain maps revealed that bilingual picture naming activated the same regions. However, there exist significant differences in the activation intensity of P3 component between Chinese and English picture naming in Supramarginal Gyrus and Postcentral Gyrus. The results show that highly-exposed, familiar, simple words in second language (L2) may be represented in the same brain regions as the first language (L1) for the unbalanced bilinguals.

**Keywords:** Dual-language picture naming Event-related potentials Standard low-resolution electromagnetic tomography

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- 双语图片命名
- 事件相关电位
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