

摘要

回指 (anaphora) 的加工过程受到语义、句法、语用等多种因素的影响。约束原则 A (Chomsky, 1986) 认为反身代词在管辖语域内受约束, 但中文反身代词“自己”可在动词语义影响下回指远距离主语 (如“A 觉得 B 背叛了自己”中, “自己”与“A”而不是与“B”共指)。相较于回指近距离主语, 该过程存在额外的加工过程, 消耗更多的认知资源, 在事件相关电位上引起更大的 P300 和 P600 反应。手语是基于视空间模态的自然语言, 本研究记录了被试观看手语句子表达过程中加工反身代词时的 EEG 信号, 考察动词语义与约束原则对手语回指在线加工的影响。

研究一考察中国手语动词如何影响回指对象的选择。被试需要阅读手语句子, 报告各句回指的对象, 并对句中动词常见度评分。结果发现, 普通动词在反身代词语境下可以体现出语义倾向的差别, 导致反身代词可以回指“近距离主语”、“远距离主语”或两者皆可; 语义倾向性与动词常见度之间未发现相关关系, 表明该倾向性可能与动词常见度无关。

研究二考察动词语义影响反身代词回指“近距离”、“远距离”或两者皆可三种情况时, 关键词“自己”上的 ERP 反应。发现“近距离”较“远距离”条件引起了更大的 P300 反应; 相较回指“近距离”的条件, 回指“远距离”以及“两者皆可”时产生更大的 Nref 反应。作者认为, 在“近距离”条件下, 先行词因同时满足语义线索的要求与句法上约束原则 A 的要求而更加凸显, P300 反映了加工系统在连结反身代词与先行词时注意资源的投入; “远距离”条件虽然语义上合理, 但是由于不满足约束原则 A 的要求, 导致在提取词义过程中需要付出更多的认知努力, 因此出现 Nref 效应。

研究二还通过分析手语反身代词回指解读中相关的神经振荡过程, 发现相较于回指“两者皆可”, 回指“近距离”时出现于 100-300ms 时间窗内 Theta 频段 (4-7Hz) 左偏侧化的事件相关同步。该现象说明, “近距离”条件下先行词在工作记忆中激活过程更高, 这可能是由于该条件下的回指加工不需要跨越句法边界, 提取难度更低而造成的。

关键词: 反身代词; 手语; 普通动词; P300; Theta 振荡

Abstract

The processing of anaphora is influenced by various factors such as semantics, syntax, and pragmatics. The Principle A of Chomsky's Binding Theory requires the reflexive pronoun to be bound to its antecedent within its governing category. However, Chinese reflexive can refer to the local subject, depending on properties of the verb. This violation of Principle A comes with processing costs during sentence comprehension, eliciting P300 and P600.

We investigate whether the reflexive of Chinese sign language, like Chinese, can refer to either the matrix subject or the local subject or both, depending on the verb in the sentence and, if so, how the syntax cue, the requirement of binding theory A, and the semantic cue, the property of the verb, interact during the anaphor comprehension.

In study one, we asked our participants to make a forced choice on which antecedent the Chinese sign language *ziji* in the given sentences refer to. According to the result, Chinese sign language *ziji* do can refer back to the matrix subjects, and no significant correlation was found between verb's semantic orientation and commonness.

Based on study one, in study two, we investigated the time course of the reflexive comprehension in Chinese sign language. The ERP responds showed that, it was not the long-distance condition compared with the local condition that induce a larger central posterior P300, but the opposite. Also, compared with the local condition, the long-distance condition and the ambiguous condition elicited larger Nref effect. We discuss this result under the perspective of enhanced costs for attention causing by the congruent requirements from both binding theory A and the property of the verb. In addition, by analyzing the neural oscillations associated with the interpretation of sign language reflexive pronouns, we found an increased theta-band synchronization elicited by the local condition, which suggests a higher activation of local subject in the working memory.

Key words: reflexives; sign language; plain verb; P300; Theta-band