

Abstract

Abstract of thesis entitled: **Color Simulation: the Activation of Perceptual Color Representation in Language Comprehension**

The present research was conducted to give a systematic treatment of color simulation in language processing to enrich understanding of perceptual simulation. Two main questions have been addressed here, namely 'what is the time course of color activation in language units such as noun phrase and abstract words?' and 'do linguistic simulation and perceptual simulation (especially the unconscious part) of color co-exist in language understanding?'

Results from all three experiments in the first study showed a robust demonstration of the activation of perceptual representation of color information or the presence of color simulation in phrase processing. Results from prime-target stimulus-onset-asynchrony (SOA) manipulation provided time course information of the relative activation of the two types of colors.

The second study involving three experiments, further extended the finding in Study I to demonstrate the presence of color simulation to an even smaller and abstracter linguistic unit of single words. Results from SOA manipulation indicates a more rapid activation of color information for the words psychologically-related to color, followed by activation of color for object nouns, and slowest color activation for verbs.

In study III, two event-related-potential (ERP) experiments show a clear modulation from preceding object noun on the early ERP components of the following object picture that are known to be associated with perceptual processes and provide by far the strongest evidence that semantic processing

cannot account fully for the congruence effects supposed to indicate color representation.

In summary, color representation is found to be present not only for color information implied by the global phrase context but also for color information irrelevant to the global phrase context, not only for words with direct and concrete associations with color but also for words where such associations are indirect and less concrete. ERP results also provide strong support that color simulation does occur at the perceptual level as argued by embodied cognition theorists and cannot be attributed totally to semantic processing. Briefly, the present research provides a rich dataset and valuable insights deepening the understanding of perceptual color simulation in phrase and words.

論文摘要

本研究主要考察了兩個問題：（1）顏色的表徵是否能存在於短語和詞語水平？（2）在語言理解中，顏色的表徵是存在於感知覺水平，語言加工水平，還是兩種表徵同時存在？

研究一的三個實驗一致的發現對短語顏色塊（即顏色塊的顏色與整個短語所隱含的顏色一致）的命名比對不一致顏色（即與短語中所可能隱含的任何一種顏色不一致）的命名要快。另外，短語中目標詞語的典型顏色也發現被激活了。這個結果表明顏色的自動激活可在一定程度上脫離上下文，并可為生活經驗所影響。

SOA 的結果表明，短語顏色和典型顏色在時間進程上存在不同，即短語顏色激活較快且程度較強，而典型顏色激活較慢且程度隨著 SOA 的增加而慢慢攀升。

在研究二中，顏色塊與物體的典型顏色一致時，命名時間較短。這樣的一致性效應同樣存在於動詞，以及那些與顏色有著相同心理聯繫的詞語（例如，危險隱含著紅色）。SOA 的結果表明心理顏色聯繫詞語激活最快，接著是物體詞語，最後是動詞。

總之，本研究考察了顏色表徵在短語和詞語加工中的作用，並表明了語言加工中顏色表徵的多層次性，以及感知覺層面的顏色表徵的存在，由此為具身認知理論提供了一定的證據。

Submitted by LU, Aitao for the degree of doctor at The Chinese University of
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