

THE N400 ERP: SEMANTIC VS. EVALUATIVE INCONGRUITIES

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Dedication

To my family for never giving up on me.

PREVIEW

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THE N400 ERP: SEMANTIC VS. EVALUATIVE INCONGRUITIES

by

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PREVIEW

Abstract

The objective of this research was to utilize both behavioral (response times) and psychophysiological measures (ERPs – N400 & Pre-response Positivity) to uncover the cognitive mechanism responsible for the evaluative priming effect (spreading activation vs. response competition) by controlling for semantic influences. This research project examined the evaluative incongruity effect by controlling for semantic influences in two separate studies. The first study kept semantic associations among word pairs completely random, while the second study controlled for semantic associations by either pairing words from the same semantic category (e.g., animal-animal) or from different semantic categories (e.g., animal-person). Participants completed an evaluative task by indicating if the second word in the word pair was good or bad. Although the results from study 1 did not show a significant behavioral evaluative effect, the response competition mechanism was supported by findings that showed a marginally significant response-monitoring ERP component (PRP). Response competition was further supported with both behavioral and psychophysiological findings in study 2. The results showed a behavioral evaluative effect, where participants responded faster to evaluatively congruent word pairs than to incongruent word pairs and also found a significant PRP. The N400 was not found in either of the two studies and therefore did not lend support for spreading activation. The findings from both of these studies support response competition as the mechanism underlying the evaluative priming effect and question the possible role of spreading activation. Future studies should further explore the comparative approach by varying word pairs on both a semantic and evaluative dimension.

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PREVIEW

Chapter 1: Introduction

The cognitive mechanisms underlying evaluative processes, such as attitudes and emotions, have yet to be fully understood. The cognitive processes that are activated when a person encounters an attitude object are of great importance because attitudes help guide behavior and act as a “ready aid” when making decisions (Fazio, Ledbetter, & Towles-Schwen, 2000). To investigate evaluative processes, researchers have utilized variations of existing semantic paradigms to determine the cognitive mechanism underlying the evaluative priming effect. The aim of this research was to utilize both behavioral and psychophysiological measures to uncover the cognitive mechanism responsible for the evaluative priming effect as well as to examine the role of semantic associations. In order to discuss relevant literature examining evaluative effects, it is necessary to first discuss the cognitive mechanism responsible for the semantic priming effect established in foundational research studies.

1.1 BEHAVIORAL SEMANTIC PRIMING

For decades semantic priming has been investigated and established as a procedure that involves the presentation of a word prime that either semantically matches or mismatches the target word. The semantic priming effect has commonly been examined by using the lexical decision task, in which participants are instructed to indicate whether a target letter string is or is not a word. The effect is said to be present when a participant responds faster and more accurately to a target word (e.g., table) when it is preceded by a semantically related word prime (e.g., chair) compared to a semantically unrelated word prime (e.g., cat) (Neely, 1977; for a review see Hutchison, 2003). The cognitive mechanism that has been proposed to underlie the semantic priming effect is automatic spreading activation (Neely, 1977). The theory of spreading activation was first introduced by Collins and Loftus (1975) who stated that semantic memory is