

Mismatch negativity: An early ERP response to study lexical processing and decomposition.

Lexical processing is the basic process of language comprehension. The null hypothesis dictates that only sound and meaning constitute the bases for lexical representations. However, decades of linguistic research indicate that the actual constituents of language are morphemes (Marantz, 2013), and that lexical processing proceeds via access to the constituent morphemes of lexical representations. Both hypotheses have been tested within the 'storage versus decomposition' debate in psycholinguistics, but behavioral results have been unable to present a clear picture of the phenomenon (Giraud & Voga, 2014)

The goal of this study is to shed light on the storage versus decomposition debate by using a relatively new approach to the study of lexical representations: The mismatch negativity (MMN) response (Näätänen et al., 1978; Leminen et al., 2013). This ERP component has been shown to be modulated by the strength of lexical representations. Specifically, monomorphemic words have been shown to yield bigger responses than acoustically-matched pseudowords (Alexandrov et al., 2011), precisely because of the bigger consolidation of neural pathways involved in the representations of existing words. However, morphologically complex words have shown an opposite pattern of results: They show smaller responses than acoustically-matched pseudowords (Bakker, 2013), suggesting that the processing of suffixes in said words is primed by the processing of the preceding morpheme (the root), thus yielding smaller MMN responses.

These findings have been reported in German (Pulvermüller et al., 2007), Finnish (Shtyrov et al., 2003) and English (Bakker et al., 2013). Consequently, it stands as a promising candidate to study the cognitive mechanisms of lexical processing. The purpose of this study was to validate the experimental paradigm in Dutch by eliciting bigger MMN responses to monomorphemic Dutch nouns (lexical MMN) and smaller MMN responses to plural Dutch nouns (the syntactic MMN) within tightly controlled experimental conditions that can preclude the influence of other variables like phonology or semantics.

Our results confirm that the MMN can be used to probe the strength of representation of memory traces, and provides partial evidence for the decomposition of one plural Dutch noun. The purpose of this presentation is to present researcher in the field with a new experimental method to answer these questions, and to test these paradigms across a wide spectrum of languages and grammatical paradigms.