

Time course of use of semantic and syntactic context information during spoken-word processing

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An event-related brain potential experiment was carried out to investigate the time course of the use of different sources of higher-level context information in relation to lexical information during sentence processing. Previous ERP language research has demonstrated the sensitivity of several ERP components to different types of information processing. Whereas the N400 reflects semantic integration processing, the left anterior negativity (LAN) and the P600 are related to syntactic processing. The sensitivity of these ERP components was used to investigate whether specific syntactic information about the word category has priority over semantic information, as suggested by 'syntax-first' models, or whether these two types of information are processed in parallel as proposed by interactive models. Subjects listened to Dutch constraining sentences that contained a critical word that was either a semantically and syntactically congruent noun, or a semantically and syntactically incongruent verb. The moment at which the verb and a possible noun continuation started to diverge was labeled the category violation point (CVP), and was on average 330 ms after word onset for the incongruent condition. The results revealed that relative to the congruent critical words, the incongruent condition elicited a large N400 followed by a left anterior negativity (LAN) time-locked to CVP and a P600. Important to the issue at hand, the N400 in the semantically and syntactically incongruent condition set in before information about the word category had become available, as reflected by the LAN. These results provide clear evidence against the claim that building of syntactic-phrase structure, based on word category information, is autonomous and precedes semantic integration processes, as claimed by 'syntax-first' models. Instead, the present study testifies to the incremental and cascaded nature of on-line language processing. It shows that the language system works with the information it receives and uses it immediately.

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