

types of sentences. In the first sentence type, the critical word belongs to the most expected word category on the basis of previous sentence context (an article following a verb). In the second sentence type, the critical word belonged instead to an unexpected but correct word category (an article following an adjective). Words were presented according to the rapid stream stimulation paradigm with the purpose of studying several steps involved in language processing. Electroencephalographic activity to critical words was recorded in order to analyze event-related potentials. Unexpected words evoked a negativity in the 300–500 ms time window (N400) that was absent for expected words. These results support psycholinguistics models that differentiate between the processing of expected and unexpected syntactic structures.

Individual Differences in Syntactic Processing of a Second Language: Electrophysiological Evidence

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Several studies have shown electrophysiological differences when comparing the processing of sentences in a first language (L1) with respect to the processing sentences in a second language (L2) (Weber-Fox & Neville, 1996; Hahne & Friederici, 2000). While lexical-semantic processing is the same between L1 and L2, differences have been observed in the syntactic processing. However, artificial language learning studies have found that, in a short period of time, learners process the artificial language in a similar way than a natural language (Friederici et al., 2002). The present study compared event-related potentials (ERPs) elicited by sentences with different types of lexical-semantic and syntactic violations of a group of Basque native speakers (L2 Spanish) and a group of late learners (L1 Spanish). The participants performed a grammatical judgment task with correct and incorrect sentences during an ERP recording. The behavioral results showed individual differences among the nonnatives (good and poor learners). The ERP data suggested that good learners are similar to the natives; whereas the poor learners did not show differences between correct and incorrect sentences. These results show that factors such as age of acquisition and exposure to the second language do not sufficiently explain the individual differences observed in the learning of a second language.

Event-Related Potentials to Measure the Lexical-Syntactic Interface

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The goal of this study is to investigate two levels of sentence processing: the lexical level and the syntactic temporal agreement of a verb with a previously presented adverbial phrase. Event-related potentials were registered on a verb of the Spanish third conjugation. This verb could be correctly assembled (e.g. “definirá,” “will define”), or on the contrary, an erroneous thematic vowel was included (e.g., “definará”), which transformed this verb into a pseudoverb. Both forms agree with a temporal adverbial phrase situated at the beginning of the sentence (e.g., “el pró-

ximo año,” “the next year”), in contrast with some other sentences which incorporated a violation of the temporal agreement (e.g., “definía/definaba,” “defined/defaned”). The results showed an early agreement effect peaking around 200 ms. on the left-central area for all types of stimuli. This effect points to a first step of processing, where the participant searches for the temporal agreement with the verb, even when this stimulus is not a word. When the N400 windows was analyzed, the effect of agreement remained only for verbs and not for pseudoverbs. It seems that, at this moment, the lexicality of the verb is modulating the syntactic agreement.

Symposium 5: Psychophysiology and Neuropsychology

Emotional Response Following Damage to Prefrontal Cortex

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Previous research has proposed that the prefrontal cortex is a part of the neural circuitry which underlies both experience and expression of emotion. However, the role of this frontal region on emotion is not well known. Hence, the aim of this study was to examine the involvement of the prefrontal cortex in the emotional response. For this purpose, we employed a startle reflex modulation paradigm in 17 patients with acquired prefrontal brain damage. Subjects viewed 54 pictures (18 unpleasant, 18 neutral, and 18 pleasant) selected from the IAPS, while the orbicularis oculi electromyography activity was recorded. To elicit the startle reflex a 50-ms burst of white noise was delivered in 12 pictures of each category. As a group, patients showed a trend to respond with a startle enhancement to unpleasant pictures. Specifically, ventromedial patients showed a higher response to unpleasant than to pleasant pictures. These results give support to the proposal about the role of the prefrontal cortex in the emotional response, and suggest the involvement of the ventromedial cortex in the response to pleasant emotions.

Cardiovascular Responses, Testosterone Levels and Cerebral Asymmetry after an Anger Induction Laboratory Task

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We investigate the cardiovascular and hormonal responses, together with cerebral asymmetry, after an anger induction laboratory task. The Englebretson mood induction method was applied to induce anger in 30 healthy, right-handed men. The subjective change was valued by means of the rage-hostility subscale of the POMS.