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"Mismatch negativity as tool in language acquisition research: Discrimination on auditory-phonetic and/or semantic levels?"

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Phoneme discrimination is one of the first steps on the infants' path to identify word boundaries and to build a lexicon. Within the first year of life, infants turn their early global discrimination skills into language-specific tools, paving the way to fast word acquisition. This development has been demonstrated in countless behavioural discrimination studies, but also with electrophysiological measures such as event-related potentials (ERPs). The typical ERP-component that responds to a deviant in a series of standard stimuli, thereby indicating discrimination between standard and deviant, is called mismatch negativity (MMN). MMN is generally an early ERP-component at around 150 to 200 ms after stimulus onset, representing automatic processing on a pre-attentive level. It can be elicited in a passive listening paradigm while watching a silenced movie and is therefore especially suitable for infant studies. However, higher cognitive processing such as semantic discrimination can also be indicated by MMN with a latency of 400 to 450 ms after stimulus onset.

This study tests whether auditory-phonetic and semantic processing levels are reflected in the MMN when comparing a simple syllable discrimination task to a word discrimination task, after the standard and deviant syllable stimuli have been supplied with semantic content. The syllables [be]-[de] are expected to be discriminated in the first experimental block (50 trials), indicated by a typical MMN in the participants' ERPs. In a second block (50 naming trials), these syllables become names for two different jackalope soft toys while the participant eye movements are recorded. In the third block (50 trials), the MMN paradigm is run again, but this time with the expectation that higher level processing is indicated in the MMN response. This could be either reflected by a significantly more pronounced MMN curve or by a greater latency of the MMN response. We report pilot results of adult participants (N=7), run to evaluate the experimental paradigm before testing toddlers.