On the encoding of syllables in language production

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In this talk I will discuss the results of three experiments in which we investigated the encoding of syllables and syllable-like sequences during production tasks. All experiments were conducted with native speakers of French. According to a dominant hypothesis in psycholinguistic research (Levelt & Wheeldon, 1994), the production of frequent syllables relies on stored syllable-sized abstract motor commands. In the first experiment, we tested a prediction of this account, namely that the production of frequent syllables (e.g., /bRə/) and that of non-existing syllable-like sequences (e.g., /kmɛ/) are governed by different cognitive mechanisms. We asked participants to produce existing syllables and non-existing syllable-like sequences and monitored their Electroencephalographic (EEG) signal during the task. The results of EEG-topographic analyses suggest that different neural networks are involved in the production of frequent versus non-existing syllable-like sequences, in turn suggesting different sets of cognitive mechanisms. Building on this finding, the second experiment investigated whether the cognitive mechanisms underlying the production of syllables and syllable-like sequences can be modified by training and whether this change depends on the modality of training. Participants were trained to produce and perceive syllables and non-existing syllable-like sequences during two days. On the third day, they were asked to produce trained and untrained syllables, while their EEG was monitored. Untrained High frequency and non-existing syllable-like sequences differed in all EEG analyses. Notably, these differences were no longer present after production or auditory training, suggesting that the cognitive processes underlying the production of non-existing sequences can be changed by a mere auditory exposure to these sequences. In a third experiment, we built on the finding that participants in experiments tend to imitate the speech of a model speaker (e.g., Goldinger, 1998) in tasks where they must repeat words. We examined whether imitation is limited to cases where the speaker produces the same word as the model speaker (e.g., *carrot-carrot*) or extends to cases where the two words share a syllable (*carrot-cathedral*) and cases where the two words share two phonemes across a syllable boundary (*sofa-tofu*). The results suggest that when participants imitate in the word-word condition, they also do so when the overlap involves a syllable or diphone. The findings of these three studies will be discussed in the light of current models of language production / assumptions regarding the interface between the production and perception systems in psycholinguistics (and beyond).