Finding abstract representations of sound structure

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Traditional descriptions of phonology have included a role for both context-independent and context-dependent representations of sound structure. The most common formulation has included context-independent segmental representations in the lexicon which are mapped onto language-specific context-dependent representations that encode the more detailed output. Throughout the cognitive sciences, there has been a push to question whether it is necessary to posit abstract and context-independent representations. This issue has been especially important in the study of sound structure, where the relative ease of examining the acoustic and articulatory details of speech has facilitated a rapid re-assessment of many phonological phenomena, frequently with the conclusion that the abstract representations cannot be found.

In this talk, I present data primarily from individuals with sound production impairment subsequent to stroke. In this population, it is also difficult to separate phonological vs. phonetic errors. I will report on a series of studies that have explored whether we can determine predominant error types from the properties of errors. The data indicates that individuals may have deficits that affect the computations over context-independent representations (classic segmental errors) or context-dependent representations, suggesting that these are distinct levels that can be affected by impairment. By systematically exploring the nature of the deficits, we can then learn about the computations that occur at those distinct levels. I will report on three aspects of those computations: first, that deficits at the context-independent level are affected by syllabification; second, that deficits at the context-dependent levels are affected by repeated practice of difficult sequences; and third that both levels are affected by sonority sequencing (though perhaps for different reasons). Through these examples, I hope to demonstrate the mutual benefits of combining the study of phonology and the study of speech and language impairment.