The role of underspecification in grammar

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In order to understand the human ability for language, we cannot simply focus on the idealized monolingual speaker or signer (Chomsky, 1965). Rather, as much work in second language acquisition has recognized, it is also necessary to study instances where a person masters two or more languages at different levels of proficiency. Today's globalized world with increased migration will further increase the number of multilingual speakers. However, another piece of the puzzle involves understanding the grammatical system of bilingual speakers who use both a sign language and a spoken language, or put differently, bimodal bilingualism. This latter type of bilingualism is clearly yet another possible human I-language (in the sense of Chomsky, 1986), meaning that our theories of the human language faculty also need to accommodate facts from this group of speakers. It is this population that is the focus of the current keynote paper by Lillo-Martin, Müller de Quadros and Chen Pichler (2016, henceforth LMC).

Theoretically, there are two main options when faced with a type of speakers that has yet to be adequately described and understood. One can either devise a special theory which only applies to that particular type of speakers, or one can opt for what is typically called a null theory: One theory of the human language faculty irrespective of the number of languages a given individual masters. Occam's Razor clearly suggests a preference for the latter type of theory, presuming that descriptive adequacy can be maintained.

In their paper, LMC opt for a null theory. They show how a specific type of theory, namely Distributed Morphology, can be extended to also account for bimodal bilingualism.

Their project is both important and highly impressive at several levels. Firstly, the paper connects sign languages to modern linguistic theory, which should be viewed as just as important as studying spoken languages. The authors show how Distributed Morphology rather easily can be accommodated to also deal with sign languages. Secondly, the paper offers new data involving what LMC call code-blending, which is the simultaneous production of a sentence in both speech and sign. This expands the typology of possible mixing patterns which will be important for a range of theories dealing with language mixing, including both formal and non-formal approaches. Thirdly, the paper is important in that it demonstrates the potential for theories of grammar to cover not only monolingual and multilingual speakers, but also the same groups of signers. As such, the paper can be seen as providing crucial support for a formal generative perspective on the human ability for language: If the model successfully accounts for such a wide-range of data, that would demonstrate that it is a viable theory of linguistic competence. If the theory had been fundamentally misguided, it would have taken quite a coincidence for this to have happened. In my opinion, LMC take a big step towards fulfilling this statement.

In this commentary, I would like to focus on the theoretical consequences of their approach. There are several issues that could be discussed, but for reasons of space, I will limit myself to issues relating to underspecification (see Alexiadou 2016 for comments regarding roots).

LMC argue for a Distributed Morphology (henceforth, DM) approach to grammar and show how this theory can account for their data. Within DM, underspecification plays a major role (see Embick, 2015 for an overview). The syntactico-semantic features that appear on the terminal nodes are always fully specified, but the vocabulary items that apply to these positions need not be. Consequently, it is possible for the same vocabulary item to be inserted into multiple syntactic positions. Insertion is governed by the Subset Principle (Halle, 1997;

Embick & Noyer, 2007: 298), which holds that a phonological exponent is inserted if all or a subset of the features specified in that position match the exponent's features. Such a model has been applied successfully to a range of other cases of language mixing (Liceras, Fernández Fuertes, Perales, Pérez-Tattam, & Spradlin, 2008; Pierantozzi, 2012, Grimstad; Lohndal & Åfarli, 2014), whereby underlying abstract feature matrices may be realized by elements from both languages. The crucial part of the present paper is that this mechanism can be extended to modality. Put differently, the model has two phonological levels: One for speech and one for sign. The authors call this the Language Synthesis Model and it is depicted in Figure 3 (p. 18) in their paper. The model straightforwardly predicts mixing patterns on a par with those attested for spoken language, but now with the added possibility of mixing between speech and sign. Importantly, however, the model also accommodates and predicts that both phonological levels can be activated at the same time, yielding the production of speech and sign simultaneously. As such, the model allows for what they describe as "combining parts of the grammar in new ways" (LMC, p. 17).

The approach by LMC provides further support for the concept of underspecification in language. Beard (1966, 1995) suggested what has become known as the *Separation Hypothesis*, namely the hypothesis that morphemes do not possess phonological features as part of their underlying representation. This idea was also inherent to Chomsky (1957, 1965), where abstract syntactic terminals were *realized* by way of operations post-syntax. However, traditionally work adopting underspecification has assumed a mapping onto speech. LMC add to this by also including sign as a possibility, also simultaneously with speech. This entails that the underlying grammars for sign language and spoken language are the same and that the difference is only one of physical articulators.

DM and the Language Synthesis model are both clearly anti-lexicalist in nature. Sound and meaning come together at Vocabulary Insertion, they are not combined into

traditional lexical entries. One question that could be asked is what a lexicalist alternative would require in order to account for the core data in LMC. Many of their examples involve structures from one language and vocabulary items from another. A lexicalist alternative would need to specify a double set of entries whereby the sign language has lexical items specified for the properties of the sign language and other lexical items specified for the properties of the spoken language. Put differently: Imagine an individual with languages 1 and 2, and lexical items LI_1 and LI_2. All lexical items are specified for features for the grammatical properties of each language. If this individual uses the structural properties of 1 and the lexical items from 2, that would, on a lexicalist analysis, entail that, in addition to a given lexical item specified as γ_1, they would also need identical-looking lexical items specified for γ_2. This would be a very uneconomical analysis and it is rather unclear why a sign language should contain lexical items specified for the properties of the spoken language. Such an analysis fails to capture an insight that a late-insertion DM-analysis makes available.

LMC dub their approach the "Language Synthesis model". From several points of view, their model seems more like a natural extension of DM into a different modality. Although the term 'synthesis' makes sense given their focus on code-blending, it is not really clear that the model requires a different name compared to DM. It is still a late-insertion approach identical to traditional DM approaches, only with two phonologies. On the other hand, an argument for invoking a separate name is that this is a model that explicitly addresses sign language. This is important given the lack of theoretical work on sign language compared to spoken language.

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