

One-Channel Translation

Prequel of arbitrariness in post-phonological spell-out

This talk contrasts the two means by which the output of a given module can be transferred to another module: computational and lexical translation. The former takes the output of the sending module, transforms it by way of a computational action and returns the input of the receiving module. This input-output relationship turns items of a given vocabulary set into items of another vocabulary set, e.g. a (syntactic) NP into a (phonological) ω . The mapping algorithm of SPE (which transforms morpho-syntactic structure into hash-marks), mapping rules in classical Prosodic Phonology and more recent OTed versions thereof (Align) are cases in point, and the computational nature of translation is conceptualized by Jackendoff (2002) in the larger perspective of Cognitive Science.

The same labour may be done by a lexical access, rather than computationally: like in a multilingual dictionary, an item of vocabulary set A (belonging to the sending module) is lexically related to an item of vocabulary set B (belonging to the receiving module). These correspondences are hard-wired, i.e. stored in long-term memory. On this count, no computational action is performed during translation.

Interestingly, computational translation is the unquestioned standard in generative linguistics since SPE, but at the interface of morpho-syntax with phonology concerns only non-morphemic information, i.e. the one that is not stored in the lexicon but created by online morpho-syntactic computation (NPs etc., which are transformed into hash marks). Morphemic information on the other hand is shipped to phonology through a lexical access: spell-out accesses a lexical entry of a morpheme and inserts its phonological representative into the linear phonological string. Nobody has ever considered a computational management of the translation of morphemic information.

The question is why two completely distinct mechanisms are used: couldn't the labour be done by just one mechanism? What are the reasons for having both, and for the fact that they are distributed over morphemic and non-morphemic information the way they are (why isn't translation of morphemic information computational, while non-morphemic information is done through a lexical access)? The reason for morphemic information being translated lexically is obvious: morphemes are stored in the lexicon and could not possibly be the output of a computational action. The question then is why non-morphemic information isn't treated the same way. A plausible answer (but which is never explicit in the literature) is that hash marks, ω 's and the like are not lexical items: they are not stored in long-term memory – hence they cannot be related to morpho-syntactic information through a lexical access. Carriers of morpho-syntactic information in phonology are absent from the lexicon only because nobody has ever designed such carriers that are true lexical items, though. Were there such lexically stored items, they could be the output of a regular lexical access.

I argue that computational translation is impossible in a modular environment because it violates basic modular principles: the translating device needs to "know" two distinct vocabulary sets. The very existence of distinct vocabulary sets and hence the necessity of translation, however, imposes that any given computational system only understands and is able to parse one type of vocabulary (domain-specificity). If computational translation is not an option, it follows that carriers of morpho-syntactic information in phonology must be stored in the lexicon. As such they need to be storable, which is shown to impose an interesting and productive restriction on possible carriers.

In absence of computational translation, there is only one channel for the transmission of information among modules: the lexical channel. That is, translation works like a dictionary, and dictionary relations are arbitrary. While this is an obvious and undisputed property of the translation between morpho-syntax and phonology (there is no reason why past tense spells out as *-ed* in English rather than, say, as *-u*), it is anything but intuitive for the relationship between phonology and phonetics. Still the channel of this translation must be lexical as well, and hence the relationship between items on both sides arbitrary.

Reference

Jackendoff, Ray 2002. Foundations of Language. Brain, Meaning, Grammar, Evolution. Oxford: Oxford University Press.