An alternative, phonetically based phoneme analysis of the Danish consonant system

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The standard phoneme analysis of the Danish consonant system (e.g. Rischel 1970, Basbøll 2005, Grønnum 2005) presents a good diachronic description, but we argue that it is a poor synchronic description due to three serious problems. 1) The standard analysis results in a large number of neutralisations that cannot be dissolved. A coda [ɪ̯] can represent two different consonant phonemes (/g, j/) while a coda [ʊ̯] can represent three different consonant phonemes (/b, g, v/), meaning that [ɪ̯] and [ʊ̯] can represent the same phoneme (/g/). Due to lacking alternations for a large number of lexemes, it is simply impossible to determine their phonemic form, which conflicts with the widespread assumption that speakers store phonemic forms in their lexicon (see e.g. Hayes 2009; Gussenhoven & Jacobs 2017). 2) The standard analysis is based on historical variation that no longer occurs in standard Danish. Due to the loss of voicing in /b, d, g/ and the loss of the so-called *soft g* (the velar continuant) (Brink & Lund 2018), the standard analysis establishes several phonemes whose allophones lack common phonetic content. The different realisations of /g/, for instance, i.e. [k, ɪ̯, ʊ̯, Ø], do not have a single phonetic property in common. As lexical representations have to be built bottom-up from the data available in the language input, this is a huge problem for acquisition, since there is nothing in the phonetic input to suggest that these phones have anything in common. 3) The analysis does not apply to the bulk of the Danish lexicon as it is based on morphological alternations of a small subset of the Danish vocabulary, specifically irregular verbs (e.g. *ba*[ɪ̯] – *ba*[k]*te*, *bake! – baked*) and loanwords (e.g. *filolo*[Ø] – *filolo*[k]*i*). This is a problem for acquisition, as we assume these alternations to be acquired at a point at which the phonological system is already in place, given that 75% of Danish children have been found to have acquired all consonantal allophones by the age of five and a half years (Heger 1979).

We argue that the above-mentioned characteristics make the proposed system unlearnable from the input, and the standard analysis is hence an implausible description of the phonological system we expect native speakers of Danish to have. We therefore propose an alternative phonological system inspired by Ács & Jørgensen (2016), who proposed a different set of phonemes in onset and coda, thereby presenting a system that exhibits biuniqueness as each phoneme has one single realisation. This analysis moves the complexity from phonology to morphology under the argument that the complexities are better placed within the morphological domain than within the phonological one. While we agree with this sentiment, we suggest that neither the phonological domain nor the morphological domain need to account for this complexity stemming from irregular alternations. Instead, we propose to move the load of these irregular alternations to the lexicon, as we suggest that they are rote learned on an individual basis. We propose to keep the same set of phonemes in onset and coda with defective distribution of a single plosive /g/, which only occurs in onsets. [ɪ̯] and [ʊ̯] are always considered allophones of the phoneme whose onset realisation they most closely match (i.e. /j/ and /ʋ/). Our analysis has a number of advantages on the standard analysis. First, it is largely biunique and consequently does not result in static neutralisations, thereby making it possible to determine the phonemic form for all lexical entries. Second, all allophones of a phoneme share at least one phonetic property, thereby making the connection between allophones of the same phoneme detectable in the input. Third, our analysis does not require children to base their phonological system on irregular verb patterns or loanwords they are unlikely to learn in early childhood. We believe our analysis presents a phonological system that is learnable from the input, unlike the system presented by the standard analysis. The advantage on Ács & Jørgensen is that we suggest a smaller phonological inventory, since Ács & Jørgensen assume the semivowels to be individual phonemes and we do not.

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