

## What can Danish pre-aspiration teach us about pre-aspiration typology?

Míša Hejná, Aarhus University, Denmark (misa.hejna@cc.au.dk)

**Background.** This paper focuses on pre-aspiration, which can be defined as a period of laryngeal friction in specific sequences of sonorant and obstruent segments (e.g. *back* [pa<sup>h</sup>k]). Danish is the only north Germanic language for which pre-aspiration has not been described in the phonetic (or phonological) descriptions of the language. Yet, in an unrelated project on Danish phonetics, I have observed what seems to be its systematic occurrence. In light of these initial observations, this paper asks the following questions:

1. How frequent is pre-aspiration in Danish?
2. What is the phonetic realisation of Danish pre-aspiration?
3. How is pre-aspiration conditioned in the language?
4. What implications do the insights from 1.-3. have not only for the typology of pre-aspiration, but also for the typology of the combinatorial potentials of phonatory profiles restricted to (sub)segmental domains?

**Methodology.** The analysis is based on words read in isolation by 65 female L1 Danish speakers from Jutland, whose age is equally distributed across the ages from 20s to 70s. 4 tokens were produced by each speaker for the following words: *cap, stjap, kat, stat, mac, SDAC* (word-final fortis plosives); *Japan, rapper, data, datter, Daka, backer* (word-medial fortis plosives); *fab, stab* (word-final lenis plosives); *tabbe, tegge, sabbat* (word-medial lenis plosives). Many of these words also contain initial plosives, and combined with other words (*pale, palle; balle, base; karle*), these were used to look at potential word-initial pre-aspiration, which has been documented in a few languages before (Hejná 2025). Voiceless and voiced components of pre-aspiration were identified on the basis of previous work (Hejná 2025 for an overview).

**Results.** Preliminary analyses show that voiceless pre-aspiration does occur in Danish. While some speakers hardly ever pre-aspirate, even they pre-aspirate in at least some words. Those who pre-aspirate the most pre-aspirate at frequencies of 20%. Pre-aspiration is therefore not as common in Danish as it is in the other North Germanic languages (Saxov Lamhauge 2025). Regarding local breathiness (voiced part of pre-aspiration), slightly higher frequencies are found, but Danish again does not seem to show as high frequencies as those found in the other North Germanic languages. As is usually the case across pre-aspirating languages of the world, Danish pre-aspiration is the most frequent and longest with /k/ and /t/ as opposed to /p/. It occurs predominantly with fortis plosives, although it does occasionally occur with lenis plosives as well. The result that may – at first blush – seem the most surprising is that Danish pre-aspiration is found primarily word-initially. This nevertheless fits in the overall phonetic and phonological system of Danish: word-initial plosives are the most likely to be realised as such, and fortis initial plosives are also the most likely to be aspirated and are indeed most frequently aspirated and realised as plosives in the word-initial position in the data analysed here. In other positions, Danish plosives have been known to undergo a range of lenition processes (Puggaard-Rode 2023), which are likely to block pre-aspiration (Hejná et al. 2021).

**Implications (RQ4).** *Danish provides an example that confirms the proposal that pre-aspiration is rare because the conditions needed for it to innovate are rare* (Clayton 2010; Hejná 2025). In order to understand the typology of pre-aspiration, we need to look at the overall phonological system of languages as well as the phonetic realisation of their obstruents.