

# Articulation Rates in Scandinavian Languages: Variation in Swedish, Danish and Norwegian news presenters' speech



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## Mutual Intelligibility in Scandinavia: 'Danes are difficult to understand'

The Scandinavian languages Swedish, Danish and Norwegian are closely related and deemed mutually intelligible in descriptive literature.

Studies of inter-Scandinavian intelligibility show, however, that comprehension rates are far from perfect between speakers of the three languages (Delsing & Lundin Åkesson, 2005; Gooskens, 2006). Norwegians' and Swedes' imperfect comprehension of spoken Danish is particularly commented upon in literature and in media.

## Articulation Rate

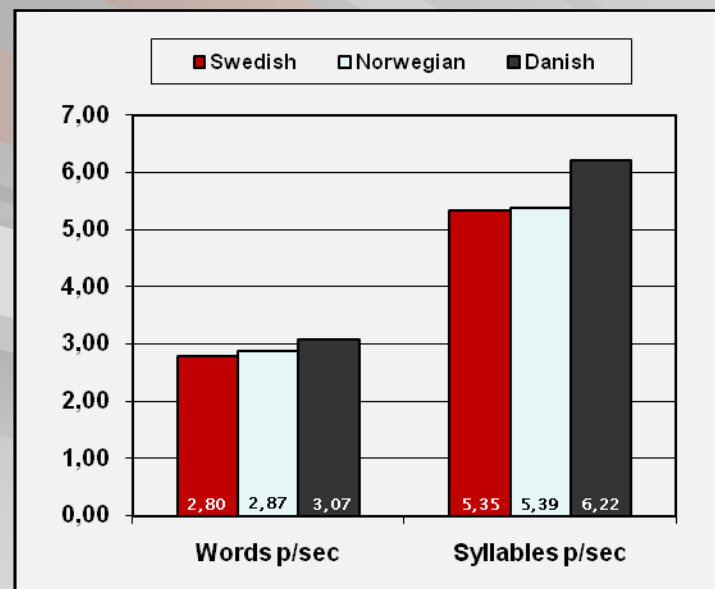
Articulation rate: number of syllables or words produced per time interval in a recording after removal of silent intervals (longer than 150 ms)

## Articulation Rate Variation in other Speech Communities

Different national and regional varieties of pluricentric languages like English and Dutch have substantial articulation rate variation (Robb, Maclagan & Chen, 2004; Verhoeven, de Pauw & Kloots, 2004).

There are also indications that articulation rate variation within speech communities are constrained by social factors like gender and age (Jacewicz, Fox, O'Neill & Salmons, 2009).

Delsing, L. & K. Lundin Åkesson (2005). Håller språket ihop Norden? [Does language keep together the Nordic countries?] Copenhagen: Nordiska ministerrådet.  
Gooskens, C. (2006). Linguistic and extra-linguistic predictors of Inter-Scandinavian intelligibility. In: J. van de Weijer & B. Los (eds.), *Linguistics in the Netherlands*. Amsterdam: John Benjamins.  
Jacewicz, E., R.A. Fox, C. O'Neill and J. Salmons. (2009). Articulation rate across dialect, age and gender. *Language Variation and Change*, Vol. 21: 233-256.  
Robb, M., M. A. Maclagan and Y. Chen. (2004). Speaking rates of American and New Zealand varieties of English. *Clinical Linguistics & Phonetics*, Vol. 18, Issue 1: 1-15  
Verhoeven, J., C. de Pauw and H. Kloots. (2004). Speech Rate in a Pluricentric Language: A Comparison Between Dutch in Belgium and the Netherlands. *Language and Speech*. Vol. 47, issue 3: 297-308.



## Conclusion

Danish public speakers have a significantly higher articulation rate than Swedish and Norwegian public speakers. These results indicate that speech rate, or prosodic factors, could be influential for intelligibility of a closely related language.

## Methodology

Radio news broadcasts were used to study articulation rates in comparable settings. More than 26 minutes (8.4 minutes Swedish; 9.5 minutes Danish and 8.3 minutes Norwegian) of fluent speech was used for the analysis. Recordings were taken from the Scandinavian national broadcasting corporations. Norwegians are from East Norway, the Swedes and Danes are speakers of standard varieties.

### Informants

19 Danes: 10 male, 9 female  
18 Swedes: 9 male, 9 female  
18 Norwegians: 9 male, 9 female

## Results: Articulation Rate Variation in Scandinavia

One-way ANOVAs were used to test for articulation rate differences among the three speaker groups.

The number of words produced per second differs significantly across the three languages,  $F(2, 52) = 3.324, p < .05$ .

The number of phonological syllables produced per second also differs significantly across the three languages.  $F(2, 52) = 22.563, p < .001$ .

There are no statistically significant articulation rate differences between genders (neither between nor within language groups) in the data set.