

# Information about Norwegian speech

## 1. A comparison between Norwegian and English phonology

Aspect	Language	Number	Details	Source
<b>Consonants</b>	<b>Norwegian</b>	22-23 consonants	/p, b, t, d, t̥, d̥, k, g, m, n, ŋ, r, ʀ, f, s, ʂ, ʃ, h, v, j, l, l̥, t̥d̥/	Kristoffersen (2007)
	<b>English</b>	24 consonants	/p, b, t, d, k, g, m, n, ŋ, θ, ð, f, v, s, z, ʃ, ʒ, h, tʃ, dʒ, j, w, ɹ, l/	Smit (2004)
<b>Consonant clusters</b>	<b>Norwegian</b>	Syllable-initial and syllable-final consonant clusters	Two and three element consonant clusters.	Kristoffersen (2007)
	<b>English</b>	Approx. 29 syllable-initial and many syllable-final consonant clusters	Many 2 and 3 element consonant clusters in initial position including /pl, bl, kl, gl, fl, sl, pɹ, bɹ, tɹ, dɹ, kɹ, gɹ, θɹ, fɹ, ʃɹ, pj, tj, fj, mj, nj, sm, sn, sp, st, sk, spl, spɹ, stɹ, skw/ and many 2 to 4 element consonant clusters in final position	McLeod (2007) Smit (2004)
<b>Vowels and diphthongs</b>	<b>Norwegian</b>	19 vowels + 3 diphthongs	Vowels: 9 long and 9 short /i, i:, y, y:, ʉ, ʉ:, e, e:, ø, ø:, æ, æ:, u, u:, o, o:, a, a:, ə/ Diphthongs: /æi, øi, æu/	Kristoffersen (2007)
	<b>English</b> (US-General American)	14 vowels + 3 diphthongs	Vowels: /i, ɪ, e, ɛ, æ, ə, ɜ, ɝ, u, ʊ, o, ɒ, ɔ, ɑ/ Diphthongs: /aɪ, aʊ, ɔɪ/ (Smit also lists 5 'r'-colored diphthongs)	Smit (2007)
	<b>English</b> (Canadian)	14 vowels + 3 diphthongs	Vowels: /i, ɪ, e, ɛ, æ, ə, ɜ, ɝ, ʉ, ʉ, o, ɒ, ɔ, ɑ/ Diphthongs: /aɪ, ʌʊ, ɔɪ/	Bernhardt, & Deby (2007)
	<b>English</b> (UK-Received Pronunciation)	12 vowels + 8 diphthongs	Vowels: /i, ɪ, ɛ, æ, a, ə, ɜ, u, ʊ, ʌ, ɔ, ɒ/ Diphthongs: /aɪ, aʊ, ɔɪ, eɪ, oʊ, ɪə, eə, ʊə/	Howard (2007)
	<b>English</b> (Australian)	12 vowels + 8 diphthongs	Vowels: /i:, ɪ, e, æ, ɛ:, ɐ, ɔ:, ʊ, ʉ:, ɜ:, ə/ <sup>i</sup> OR /i, ɪ, ɛ, æ, a, ʌ, ɒ, ɔ, u, ʊ, ɜ, ə/ <sup>ii</sup> Diphthongs: /æi, ae, əɜ, æɔ, ɔɪ, ɪə, eɪ, ʊə/ <sup>i</sup> OR /eɪ, aɪ, oʊ, aʊ, ɔɪ, ɪə, eə, ʊə/ <sup>ii</sup>	<sup>i</sup> Harrington, Cox, & Evans, (1997) <sup>ii</sup> Mitchell (1946)
	<b>English</b> (New Zealand)	12 vowels + 8 diphthongs	Vowels: /i, ɪ, ɛ, æ, ə, ɜ, u, ʊ, ʌ, ɔ, ɒ, ɑ/ <sup>i</sup> OR /i, ɪ, e, æ, a, ə, ɜ, ʊ, ʌ, ɔ, ɒ/ <sup>ii</sup> Diphthongs: /aɪ, aʊ, ɔɪ, eɪ, oʊ, ɪə, eə, ʊə/ <sup>i</sup> OR /ai, aʊ, ɔi, ei, ou, iə, eə, ʊə/ <sup>ii</sup>	<sup>i</sup> Bauer & Warren (2004) <sup>ii</sup> Maclagan (2009)
<b>Tones</b>	<b>Norwegian</b>	2 tones (accents)	Lexical tones differentiate meaning in words of more than one syllable. Accent 1 is realized with a high tone on the stressed syllable.	Kristoffersen (2007)
	<b>English</b>	0 tones	-	

<b>Syllable shape</b>	<b>Norwegian</b>	$C_{(0-3)}VC_{(0-2)}$		Kristoffersen (2007)
	<b>English</b>	$C_{(0-3)}VC_{(0-4)}$	The smallest syllable is V and the largest is CCCVCCCC <i>strengths</i> .	Smit (2004) McLeod (2007)
<b>Stress-timed or syllable-timed?</b>	<b>Norwegian</b>	Stress-timed	Uses primary, secondary or no stress.	Kristoffersen (2007)
	<b>English</b>	Stress-timed	Syllables can be strong or weak. Stress also is used for emphasis.	
<b>Varieties</b>	<b>Norwegian</b>	Yes	Urban East Norwegian (spoken by most Norwegians).	Kristoffersen (2007)
	<b>English</b>	Many dialects	Many dialects including General American English, Received Pronunciation (England), Scottish English, Irish English, Australian English, New Zealand English, South African English etc.	
<b>Writing system</b>	<b>Norwegian</b>	Two standards based on Latin alphabet	Two standards based on Latin alphabet: <i>Nynorsk</i> , and <i>Bokmål</i> . Three non-English letters are used æ, å, ø.	Kristoffersen (2007)
	<b>English</b>	Roman script	Roman script loosely related to phonetic realizations of the consonants and vowels.	

## References

### Norwegian studies

Kristoffersen, K. E. (2007). Norwegian speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 495-504). Clifton Park, NY: Thomson Delmar Learning.

### English studies

Bauer, L., & Warren, P. (2004). New Zealand English: Phonology. In E. Schneider, K. Burrige, B. Kortmann, R. Mesthrie & C. Upton (Eds.). *A handbook of varieties of English: Vol. 1. Phonology* (pp. 580-602). Berlin, Germany: Mouton de Gruyter.

Bernhardt, B. M. H., & Deby, J. (2007). Canadian English speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 177-187). Clifton Park, NY: Thomson Delmar Learning.

Harrington, J., Cox, F., & Evans, Z. (1997). An acoustic phonetic study of broad, general, and cultivated Australian English vowels. *Australian Journal of Linguistics*, 17, 155-184.

Howard, S. (2007). English speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 188-203). Clifton Park, NY: Thomson Delmar Learning.

Maclagan, M. (2009). Reflecting connections with the local language: New Zealand English. *International Journal of Speech-Language Pathology*, 11(2), 113-121.

McLeod, S. (2007). Australian English speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 241-256). Clifton Park, NY: Thomson Delmar Learning.

Mitchell, A. G. (1946). *The pronunciation of English in Australia*. Sydney, Australia: Angus & Robertson.

Smit, A. B. (2004). *Articulation and phonology: Resource guide for school-age children and adults*. Clifton Park, NY: Thomson Delmar Learning.

Smit, A. B. (2007). General American English speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 128-147). Clifton Park, NY: Thomson Delmar Learning.

### Comparative summaries

Davidson-Nielsen, N., & Harder, P. (2001). Speakers of Scandinavian languages: Danish, Norwegian, Swedish. In M. Swan & B. Smith (Eds.), *Learner English: A teacher's guide to interference and other problems* (pp. 21-36). Cambridge: Cambridge University Press.

## 2. Norwegian speech assessments

For a list of speech assessments in Norwegian see: [www.csu.edu.au/research/multilingual-speech/speech-assessments](http://www.csu.edu.au/research/multilingual-speech/speech-assessments)  
Intelligibility in Context Scale: Norwegian [www.csu.edu.au/research/multilingual-speech/ics](http://www.csu.edu.au/research/multilingual-speech/ics)

## 3. Monolingual speech acquisition (summaries and studies written in English)

Kristoffersen, K. E. (2007). Norwegian speech acquisition In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 495-504). Clifton Park, NY: Thomson Delmar Learning.

Kristoffersen, K. E., & Simonsen, H. G. (2006). The acquisition of #sC clusters in Norwegian. *Journal of Multilingual Communication Disorders*, 4(3), 231 - 241.

## 4. Multilingual speech acquisition (summaries and studies written in English)

### General summaries

Goldstein, B. A., & McLeod, S. (2012). Typical and atypical multilingual speech acquisition. In S. McLeod & B. A. Goldstein (Eds.), *Multilingual aspects of speech sound disorders in children* (pp. 84-100). Bristol, UK: Multilingual Matters.

Grech, H., & McLeod, S. (2012). Multilingual speech and language development and disorders. In D. Battle (Ed.), *Communication disorders in multicultural and international populations* (4th ed., pp. 120-147). St Louis, MO: Elsevier.

Zhu Hua & Dodd, B. (Eds). (2006). *Phonological development and disorders in children: A multilingual perspective*. Cleavdon, UK: Multilingual Matters.

Yavaş, M. (2007). Multilingual speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 96-100). Clifton Park, NY: Thomson Delmar Learning.

## Studies of multilingual Norwegian speech acquisition

Languages	Country	Study	Age of children	Total number (no. of multilingual children)**	Typically/atypically developing children	Speech /language	Production/perception
Norwegian-English	Canada	Johnson, C. & Lancaster, P. (1998). The development of more than one phonology: A case-study of a Norwegian-English bilingual child. <i>International Journal of Bilingualism</i> , 2, 265-300.	1;2 – 1;8 (language) 1;9 (speech)	1 (1)	typical	speech language	production
Turkish-German; Turkish-Norwegian	Germany, Austria, Norway, Turkey	Yazıcı, Z., İltter, B. G., & Glover, P. (2010). How bilingual is bilingual? Mother-tongue proficiency and learning through a second language. <i>International Journal of Early Years Education</i> , 18(3), 259-268.	5- to 6-years	120(90)	typical	language	perception

Note. \* Studies of typically and atypically developing multilingual children published in English were included; however, studies that only included monolingual children were excluded.

\*\*The total number of children may have included both multilingual and monolingual children, so the number in brackets provides the total number of multilingual children.