

Information about Norwegian speech

1. A comparison between Norwegian and English phonology

Aspect	Language	Number	Details	Source
Consonants	Norwegian	22-23 consonants	/p, b, t, d, t̪, d̪, k, g, m, n, ŋ, r, ʀ, f, s, ʂ, ʃ, h, v, j, l, ʎ, t̪d̪/	Kristoffersen (2007)
	English	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)
Consonant clusters	Norwegian	Syllable-initial and syllable-final consonant clusters	Two and three element consonant clusters.	Kristoffersen (2007)
	English	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, pr, br, tr, dr, kr, gr, θr, fr, ʃr, pj, tj, fj, mj, nj, sm, sn, sp, st, sk, spl, spr, str, skw/ and many 2 to 4 element consonant clusters in final position	McLeod (2007) Smit (2004)
Vowels and diphthongs	Norwegian	19 vowels + 3 diphthongs	Vowels: 9 long and 9 short /i, i:, y, y:, ʊ, ʊ:, e, e:, ø, ø:, æ, æ:, u, u:, o, o:, a, a:, ə/ Diphthongs: /æi, øi, æu/	Kristoffersen (2007)
	English (US-General American)	14 vowels + 3 diphthongs	Vowels: /i, ɪ, e, ɛ, æ, ə, ɜ, ʊ, u, o, ʌ, ɔ, ɑ/ Diphthongs: /aɪ, aʊ, ɔɪ/ (Smit also lists 5 'r'-colored diphthongs)	Smit (2007)
	English (Canadian)	14 vowels + 3 diphthongs	Vowels: /i, ɪ, e, ɛ, æ, ə, ɜ, ʊ, u, o, ʌ, ɔ, ɑ/ Diphthongs: /aɪ, aʊ, ɔɪ/	Bernhardt, & Deby (2007)
	English (UK-Received Pronunciation)	12 vowels + 8 diphthongs	Vowels: /i, ɪ, e, ɛ, æ, ə, ɜ, u, ʊ, ʌ, ɔ, ɒ/ Diphthongs: /aɪ, aʊ, ɔɪ, eɪ, oʊ, ɪə, eə, ʊə/	Howard (2007)
	English (Australian)	12 vowels + 8 diphthongs	Vowels: /i:, ɪ, e, æ, ɐ, ɐ, ɔ, ɔ:, ʊ, ʊ:, ɜ:, ə/ ⁱ OR /i, ɪ, e, æ, ʌ, ɒ, ɔ, ʊ, u, ɜ, ə/ ⁱⁱ Diphthongs: /æɪ, aɛ, əɐ, æɔ, ɔɪ, ɪə, eɪ, ʊə/ ⁱ OR /eɪ, aɪ, oʊ, aʊ, ɔɪ, ɪə, eə, ʊə/ ⁱⁱ	ⁱ Harrington, Cox, & Evans, (1997) ⁱⁱ Mitchell (1946)
	English (New Zealand)	12 vowels + 8 diphthongs	Vowels: /i, ɪ, e, æ, ə, ɜ, u, ʊ, ʌ, ɔ, ɒ, ɑ/ ⁱ OR /ɪ, ɪ, e, æ, ə, ɜ, ʊ, ʌ, ɔ, ɒ/ ⁱⁱ Diphthongs: /aɪ, aʊ, ɔɪ, eɪ, oʊ, ɪə, eə, ʊə/ ⁱ OR /aɪ, aʊ, ɔɪ, eɪ, oʊ, ɪə, eə, ʊə/ ⁱⁱ	ⁱ Bauer & Warren (2004) ⁱⁱ MacLagan (2009)
Tones	Norwegian	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)
	English	0 tones	-	

Syllable shape	Norwegian	C ₍₀₋₃₎ VC ₍₀₋₂₎		Kristoffersen (2007)
	English	C ₍₀₋₃₎ VC ₍₀₋₄₎	The smallest syllable is V and the largest is CCCVCCCC <i>strengths</i> .	Smit (2004) McLeod (2007)
Stress-timed or syllable-timed?	Norwegian	Stress-timed	Uses primary, secondary or no stress.	Kristoffersen (2007)
	English	Stress-timed	Syllables can be strong or weak. Stress also is used for emphasis.	
Varieties	Norwegian	Yes	Urban East Norwegian (spoken by most Norwegians).	Kristoffersen (2007)
	English	Many dialects	Many dialects including General American English, Received Pronunciation (England), Scottish English, Irish English, Australian English, New Zealand English, South African English etc.	
Writing system	Norwegian	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)
	English	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. Burridge, B. Kortmann, R. Mesthrie & C. Upton (Eds.), *A handbook of varieties of English: Vol. 1. Phonology* (pp. 580-602). Berlin, Germany: Mouton de Gruyter.

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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.

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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

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2. Norwegian speech assessments

For a list of speech assessments in Norwegian see: www.csu.edu.au/research/multilingual-speech/speech-assessments
Intelligibility in Context Scale: Norwegian 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.