

# Information about Hebrew speech

## 1. A comparison between Hebrew and English phonology

Aspect	Language	Number	Details	Source
Syllable-initial consonants	Hebrew	23 consonants	/p, b, t, d, k, g, ʔ, m, n, f, v, s, z, ʃ, ʒ, x, ʁ, h, j, l, ts, tʃ, ʒ/	Ben David & Berman (2007)
	English	24 consonants	/p, b, t, d, k, g, m, n, ŋ, θ, ð, f, v, s, z, ʃ, ʒ, h, tʃ, ʒ, j, w, ɹ, l/	Smit (2004)
Consonant clusters	Hebrew	Wide variety of syllable-initial and syllable-final consonant clusters	Typically two element word-initial and word-final consonant clusters.	Ben David & Berman (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, pɹ, bɹ, tɹ, dɹ, kɹ, gɹ, θɹ, fɹ, ʃɹ, 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	Hebrew	5 vowels + several word-final diphthongs	Vowels: /i, e, a, o, u/ Diphthongs: /ei, ai, oi, ui/	Ben David & Berman (2007)
	English (US-General American)	14 vowels + 3 diphthongs	Vowels: /i, ɪ, e, ε, æ, ə, ɛ, ɜ, u, ʊ, 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, ε, æ, ə, ɛ, ɜ, ʌ, u, o, ʌ, ɔ, ɑ/ Diphthongs: /aɪ, ʌʊ, ɔɪ/	Bernhardt, & Deby (2007)
	English (UK-Received Pronunciation)	12 vowels + 8 diphthongs	Vowels: /i, ɪ, e, ε, 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, ɛ:, ɜ, ɔ, o:, u, ʌ:, ɜ:, ə/ <sup>i</sup> OR /i, ɪ, e, æ, a, ʌ, ɒ, ɔ, ʊ, u, ɜ, ə/ <sup>ii</sup> Diphthongs: /æɪ, aɛ, 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)
English (New Zealand)	12 vowels + 8 diphthongs	Vowels: /i, ɪ, e, 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 /aɪ, aʊ, ɔɪ, eɪ, oʊ, ɪə, eə, ʊə/ <sup>ii</sup>	<sup>i</sup> Bauer & Warren (2004) <sup>ii</sup> Maclagan (2009)	
Tones	Hebrew	0 tones	-	
	English	0 tones	-	

<b>Syllable shape</b>	<b>Hebrew</b>	$C_{(0-2)}VC_{(0-2)}$		Ben David & Berman (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</b>	<b>Hebrew</b>	Mainly word-final stress	Mainly word-final stress.	Ben David & Berman (2007)
	<b>English</b>	Stress-timed	Syllables can be strong or weak. Stress also is used for emphasis.	
<b>Varieties</b>	<b>Hebrew</b>	Israeli Hebrew		
	<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>Hebrew</b>	Phoenician script	Phoenician script <i>abjad</i> with 22 consonants.	Ben David & Berman (2007)
	<b>English</b>	Latin script	Latin script loosely related to phonetic realizations of the consonants and vowels.	

## References

### Hebrew studies

Ben David, A., & Berman, R. A. (2007). Israeli Hebrew speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 437-456). 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.
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- 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.

## 2. Hebrew speech assessments

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

- Ben David, A., & Berman, R. A. (2007). Israeli Hebrew speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 437-456). Clifton Park, NY: Thomson Delmar Learning.
- Ben-David, A., Ezrati, R., & Stulman, N. (2010). Acquisition of /s/-clusters in Hebrew-speaking children with phonological disorders. *Clinical Linguistics and Phonetics*, 24(3), 210-223.
- Segal, O., & Kishon-Rabin, L. (2012). Evidence for language-specific influence on the preference of stress patterns in infants learning an iambic language (Hebrew). *Journal of Speech, Language and Hearing Research*, doi: 10.1044/1092-4388(2012/11-0087)

## 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.

### Summaries of multilingual Hebrew speech acquisition

- Ben David, A. (2012). Translation to practice: Intervention for multilingual Hebrew-speaking children with speech sound disorders in Israel. In S. McLeod & B. A. Goldstein (Eds.), *Multilingual aspects of speech sound disorders in children* (pp. 233-237). Bristol, UK: Multilingual Matters.

## Studies of multilingual Hebrew speech acquisition

Languages	Country	Study	Age of children	Total number of children (no. of multilingual children)**	Typically/atypically developing children	Speech /language	Production/perception
Hebrew-English	Israel	Berman, R. A. (1977). Natural phonological processes at the one-word stage. <i>Lingua</i> , 43, 1-21.	18 – 23.5 months	1 (1)	typical	speech	production
Spanish-Portuguese-Hebrew	Israel	Faingold, E. D. (1996). Variation in the application of natural processes: Language-dependent constraints in the phonological acquisition of bilingual children. <i>Journal of Psycholinguistic Research</i> , 25, 515-526.	0;11 – 1;11	1 (1)	typical	speech	production

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.