

Information about Spanish speech

1. A comparison between Spanish and English phonology

Aspect	Language	Number	Details	Source
Consonants	Spanish	18 consonants	/p, b, t, d, k, g, m, n, ɲ, r, r̄, f, s, x, j, l, w, tʃ/	Goldstein (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	Spanish	Syllable-initial clusters	A large number of syllable-initial clusters and abutting pairs	Goldstein (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, spɹ, stɹ, skw/ and many 2 to 4 element consonant clusters in final position	McLeod (2007) Smit (2004)
Vowels and diphthongs	Spanish	5 vowels	Vowels: /i, e, a, o, u /	Goldstein (2007) Maddieson (2011)
	English (US-General American)	14 vowels + 3 diphthongs	Vowels: /i, ɪ, e, ε, æ, ə, ɝ, 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, ɝ, ɜ, ʌ, ʊ, o, ʌ, ɔ, ɑ/ Diphthongs: /ʌɪ, ʌʊ, ɔɪ/	Bernhardt, & Deby (2007)
	English (UK-Received Pronunciation)	12 vowels + 8 diphthongs	Vowels: /i, ɪ, e, æ, a, ə, ɜ, u, ʊ, ʌ, ɔ, ɒ/ Diphthongs: /aɪ, aʊ, ɔɪ, eɪ, oʊ, iə, eə, uə/	Howard (2007)
	English (Australian)	12 vowels + 8 diphthongs	Vowels: /i, ɪ, e, æ, ɛ, ɜ, ɔ, oɪ, u, ʊ, ɜ, ɜ, ə/ OR /i, ɪ, e, æ, a, ʌ, ɒ, ɔ, ʊ, u, ɜ, ə/ ⁱⁱ Diphthongs: /æɪ, aɛ, əɜ, əɔ, ɔɪ, iə, eɪ, uə/ ⁱ OR /eɪ, aɪ, oʊ, aʊ, ɔɪ, iə, eə, uə/ 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 /i, ɪ, e, æ, a, ə, ɜ, ʊ, ʌ, ɔ, ɒ/ ⁱⁱ Diphthongs: /aɪ, aʊ, ɔɪ, eɪ, oʊ, iə, eə, uə/ ⁱ OR /aɪ, aʊ, ɔɪ, eɪ, oʊ, iə, eə, uə/ ⁱⁱ	ⁱ Bauer & Warren (2004) ⁱⁱ Maclagan (2009)
Tones	Spanish	0 tones	-	
	English	0 tones	-	
Syllable shape	Spanish	C ₍₀₋₂₎ VC ₍₀₋₂₎		
	English	C ₍₀₋₃₎ VC ₍₀₋₄₎	The smallest syllable is V and the largest is CCCVCCCC <i>strengths</i> .	McLeod (2007)

Stress-timed or syllable-timed?	Spanish	Syllable-timed	Stress placed on the penultimate syllable of words ending in vowels and on final syllable in other words.	Goldstein (2007)
	English	Stress-timed	Syllables can be strong or weak. Stress also is used for emphasis.	
Varieties	Spanish	Many dialects	European Spanish, South American Spanish (including Mexican Spanish, Puerto Rican Spanish, etc.).	
	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	Spanish	Latin alphabet	Latin alphabet with one-to-one correspondence between sounds and letters.	Goldstein (2007)
	English	Latin alphabet	Roman script loosely related to phonetic realizations of the consonants and vowels.	

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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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Comparative summaries

- Coe, N. (2001). Speakers of Spanish and Catalan. In M. Swan & B. Smith (Eds.), *Learner English: A teacher's guide to interference and other problems* (pp. 90-112). Cambridge: Cambridge University Press.

2. Spanish speech assessments

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

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

Summaries of monolingual Spanish speech acquisition

Goldstein, B. A. (2007). Spanish speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 539-553). Clifton Park, NY: Thomson Delmar Learning.

Studies of monolingual Spanish speech acquisition

Cataño, L., Barlow, J. A., & Moyna, M. I. (2009). A retrospective study of phonetic inventory complexity in acquisition of Spanish: Implications for phonological universals. *Clinical Linguistics and Phonetics*, 23(6), 446-472.

Goldstein, B., & Cintrón, P. (2001). An investigation of phonological skills in Puerto Rican Spanish-speaking 2-year-olds. *Clinical Linguistics and Phonetics*, 15(5), 343-361.

Jimenez, B. C. (1987). Acquisition of Spanish consonants in children aged 3-5 years, 7 months. *Language, Speech, and Hearing Services in Schools*, 18, 357-363.

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 Spanish speech acquisition

Bahr, R. H., & Matias, F. (2012). Translation to practice: Metalinguistic considerations for Cuban Spanish-English bilingual children. In S. McLeod & B. A. Goldstein (Eds.), *Multilingual aspects of speech sound disorders in children* (pp. 257-262). Bristol, UK: Multilingual Matters.

Goldstein, B. A. (2007). Spanish-influenced English speech acquisition. In S. McLeod (Ed.), *The international guide to speech acquisition* (pp. 277-287). Clifton Park, NY: Thomson Delmar Learning.

Goldstein, B. A. (Ed.). (2011). *Bilingual language development and disorders in Spanish-English speakers* (2nd ed.). Baltimore, MD: Paul H. Brookes Publishing.

Prezas, R. F., & Rojas, R. (2012). Translation to practice: Assessment of the speech of Spanish-English bilingual children in the USA. In S. McLeod & B. A. Goldstein (Eds.), *Multilingual aspects of speech sound disorders in children* (pp. 161-164). Bristol, UK: Multilingual Matters.

Yavaş, M., & Goldstein, B. (2006). Aspects of bilingual phonology: The case of Spanish-English bilingual children. In Zhu Hua & B. Dodd (Eds.), *Phonological development and disorders in children: A multilingual perspective* (pp. 265-285). Cleavdon, UK: Multilingual Matters.

Studies of multilingual Spanish speech acquisition

Languages	Country	Study	Age of children	Total number of children (no. of multilingual children)**	Typically/ atypically developing children	Speech /language	Production/ perception
Spanish-English	USA	Brice, A. E., Carson, C. K., & Dennis O'Brien, J. (2009). Spanish-English articulation and phonology of 4- and 5-year-old preschool children: An initial investigation. <i>Communication Disorders Quarterly</i> , 31(1), 3-14.	4- to 5-years	16 (16)	typical	speech	production
	USA	Bunta, F., Fabiano, L., Ingram, D., & Goldstein, B. (2009). Phonological whole-word measures in three-year-old bilingual children and their monolingual peers. <i>Clinical Linguistics and Phonetics</i> , 23(2), 156-175.	3;0 – 4;0	24 (8)	typical	speech	production
	USA	Bunta, F. & Ingram, D. (2007). The acquisition of speech rhythm by bilingual Spanish- and English-speaking 4- and 5-year-old children. <i>Journal of Speech, Language, and Hearing Research</i> , 50, 999-1014.	3;9 – 5;2	30 (10)	typical	speech	production
	USA +	Cataño, L., Barlow, J. A., & Moyna, M. I. (2009). A retrospective study of phonetic inventory complexity in acquisition of Spanish: Implications for phonological universals. <i>Clinical Linguistics and Phonetics</i> , 23(6), 446-472.	0;11 – 5;1	16 (6)	typical	speech	production
	USA	Fabiano-Smith, L., & Goldstein, B. A. (2010a). Early-, middle-, and late-developing sounds in monolingual and bilingual children: An exploratory investigation. <i>American Journal of Speech-Language Pathology</i> , 19(1), 66-77.	3;0 – 4;0	24 (8)	typical	speech	production

	USA	Fabiano-Smith, L., & Barlow, J. A. (2010). Interaction in bilingual phonological acquisition: Evidence from phonetic inventories. <i>International Journal of Bilingual Education and Bilingualism, 13</i> , 81-97.	3;0 – 4;0	24 (8)	typical	speech	production
	USA	Fabiano, L., & Goldstein, B. (2005). Phonological cross-linguistic influence in sequential Spanish-English bilingual children. <i>Journal of Multilingual Communication Disorders, 3</i> , 56-63.	5;0, 6;2, and 7;0	3 (3)	typical	speech	production
	USA	Gildersleeve-Neumann, C., Kester, E., Davis, B., & Peña, E. (2008). English speech sound development in preschool-aged children from bilingual English-Spanish backgrounds. <i>Language, Speech, and Hearing Services in Schools, 39</i> , 314-328.	3;1 – 3;10	33 (23)	typical	speech	production
	USA	Goldstein, B. & Bunta, F. (2011, in press). Positive and negative transfer in the phonological systems of bilingual speakers. <i>International Journal of Bilingualism</i> . doi: 10.1177/1367006911425817	Mean age 5;10 – 6;0	30 (10)	typical	speech	production
	USA	Goldstein, B., Bunta, F., Lange, J., Rodriguez, J., & Burrows, L. (2010). The effects of measures of language experience and language ability on segmental accuracy in bilingual children. <i>American Journal of Speech-Language Pathology, 19</i> , 238-247.	4;3 – 7;1	50 (50)	typical	speech	production
	USA	Goldstein, B., Fabiano, L., & Washington, P. (2005). Phonological skills in predominantly English, predominantly Spanish, and Spanish-English bilingual children. <i>Language, Speech,</i>	5;0 – 5;5	15 (5)	typical	speech	production

		<i>and Hearing Services in Schools, 36, 201-218.</i>					
	USA	Goldstein, B. & Washington, P. (2001). An initial investigation of phonological patterns in 4-year-old typically developing Spanish-English bilingual children. <i>Language, Speech, and Hearing Services in Schools, 32, 153-164.</i>	4;0 – 4;11	12 (12)	typical	speech	production
	USA	Gorman, B., Fiestas, C. E., Peña, E. D., & Clark, M. R. (2011). Creative and stylistic devices employed by children during a storybook narrative task: A cross-cultural study. <i>Language, Speech, and Hearing Services in Schools, 42, 167-181.</i>	6;6 – 8;4	60 (20 Latino)	typical	language	production
	USA	Gutiérrez -Clellen, V. F., Simon-Cerejido, G., & Erickson Leone, A. (2009). Code-switching in bilingual children with specific language impairment. <i>International Journal of Bilingualism, 13(1), 91-109.</i>	-	58 (58)	atypical	language	production
	USA	Hammer, C. S., Lawrence, F. R., & Miccio, A. W. (2008). The effect of summer vacation on bilingual preschoolers' language development. <i>Clinical Linguistics and Phonetics, 22(9), 686-702.</i>	Preschool	83 (83)	atypical	language	perception
	USA	Marchman, V. A., Martínez-Sussmann, C., & Dale, P. S. (2004). The language-specific nature of grammatical development: Evidence from bilingual language learners. <i>Developmental Science, 7(2), 212-224.</i>	17 – 30 months	113 (113)	typical	language	production
	USA	Patterson, J. L. (1998). Expressive vocabulary development and word combinations of Spanish-English bilingual toddlers. <i>American Journal of Speech-Language Pathology, 7(4), 46-56.</i>	21- to 27-months	102 (102)	typical	language	production

	USA	Yavaş, M., & Barlow, J.A., (2006). Acquisition of #sC clusters in Spanish-English bilingual children. <i>Journal of Multilingual Communication Disorders</i> , 4(3), 182-193.	2;11 – 4;5	40 (40)	typical	speech	production
	USA	Yavaş, M. (2010). Acquisition of /s/-clusters in Spanish-English bilingual children with phonological disorders. <i>Clinical Linguistics and Phonetics</i> , 24(3), 188-198.	3- to 7-years	30	atypical	speech	production
Spanish-German	Germany	Lleó, C., Kuchenbrandt, I., Kehoe, M., & Trujillo, C. (2003). Syllable final consonants in Spanish and German monolingual and bilingual acquisition. In N. Müller (Ed.), <i>(In)vulnerable domains in multilingualism</i> (pp. 191-220). Amsterdam: John Benjamins.	1;0 – 3;0	11 (5)	typical	speech	production
Spanish-Mandarin-Taiwanese	Not specified (most likely Paraguay and Taiwan)	Yang, H.-Y., & Hua, Z. (2010). The phonological development of a trilingual child: Facts and factors. <i>International Journal of Bilingualism</i> , 14, 105-126.	1;3 – 2;0	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.