Multilingual Children's Speech Development

DUTCH

Children's Speech Development

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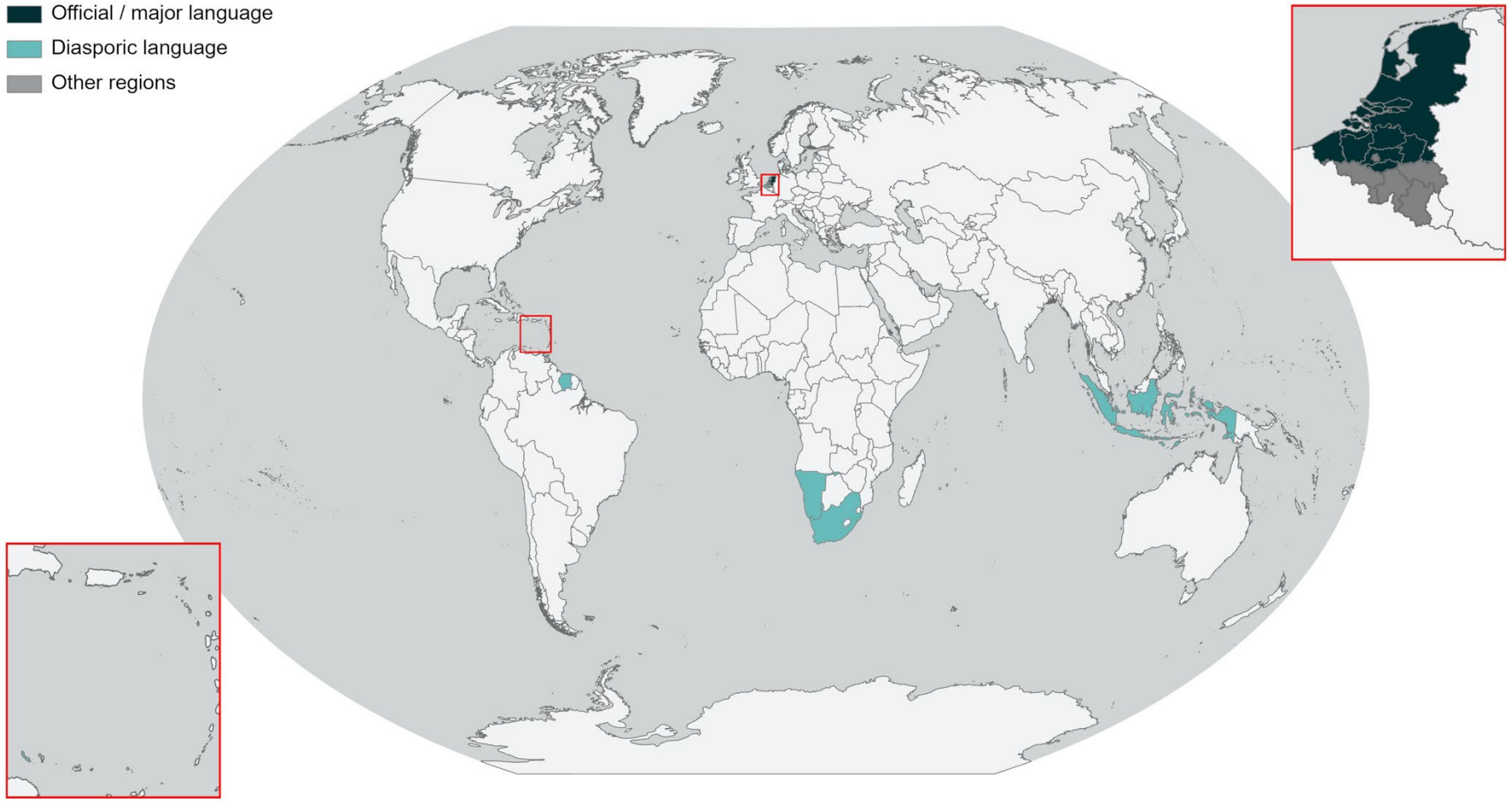
Dutch /nedərlants/

- **Commonly spoken in**
  - The Netherlands, Belgium, Suriname, Aruba, Curacao, and Sint Maarten (24 million people)

  Dialects and variants
  - 149 dialects (Statistics Netherlands, 2021)
  - Frysian, and Dutch Sign Language and other official Dutch languages
  - Limburgian is an official regional language
  - Africans is a daughter language
- **Writing**
  - Left to right. Latin alphabet (Roman script)
  - Not entirely transparent: 5 vowel letters for 14 vowel sounds; letters ‘ch’ or ‘g’ for velar /x/ and ‘ng’ for palatal /ɲ/
  - Example: **We lopen lachend samen naar school**

Dutch Map



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Dutch
Speech Components

- **Consonants (23):** /p, b, t, d, k, g, f, s, v, z, ɣ, χ, ʃ, ʒ, m, n, ŋ, l, ʀ, ʁ̞, w, ʊ, j, h/
- **Consonant clusters (many):** 29 possible combinations of 2-element consonant clusters in word-initial position
  Most frequent combination is obstruent + sonorant (e.g., *droom* /drom/ ‘dream’)
- **Vowels (13+3):** /a, ɑ, e, ɛ, i, ɪ, o, ɔ, y, ɵ, ø, u, ə, ɛi, œy, ɑu/ 13 monophthongs and 3 diphthongs (Booij, 1995)
- **Tones (0):** None (the regional language Limburgian has a lexical tone contrast)
- **Phonotactic restrictions:** $C_{(0\text{-}3}V_{(1\text{-}2)}\ C_{(0\text{-}4)}$
- **Prosody:** stress accent language, intonation similar to English (8 pitch)

Dutch
Age of Acquisition

- **Consonants**
  - **Early** /p, t, m, n/ **Middle** /b, f, ʋ, l/ **Late** /r, z, v/
  - Syllable-initial consonants are acquired by 3;7 years (except for voiced fricatives /v/ and /z/ and liquid /r/)
  - Syllable-final consonants are acquired by 4;4 years
- **Consonant clusters**
  - Percentage of consonant clusters correct (PCCC) of 34 children 1;11-3;4 = /kn/, /sx/, /sn/ < 28% /fl/, /sl/, /bl/, /pl/, /kl/ > 60% (Jongstra, 2003)
- **Vowels**
  - The vowel inventory is complete at age 3;4 (Van Haaften et al., 2020)
  - Short vowels are acquired before long vowels. Last acquired: reduced vowel /ə/, diphthong /ɑu/, long vowel /e/

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- **Percentage correct**
  - Percentage consonants correct (PCC) increases steadily from 76.3% at age 2;0-2;3 to 97.6% at age 7 (Van Haaften et al., 2020).
  - Percentage of vowels correct (PVC) is significantly higher than PCC, increasing steadily from 87.5% at age 2;0-2;3 to 98.6% at age 7
- **Intelligibility**
  - ICS-NL* average total score for 4-7 years olds is 4.5 (indicating *usually-always* intelligible) (Van Doornik et al., forthcoming)
- **Common phonological patterns**
  - Consonant deletion, cluster reduction, fronting, stopping of fricatives, and devoicing (Van Haaften et al., 2020)

*ICS, Intelligibility in Context Scale (McLeod et al., 2012)

Dutch
Children with Speech Sound Disorders

- **Also called**
  - spraakontwikkelingsstoornis → speech sound disorder
  - fonologische regelstoornis → phonological rule disorder
  - articulatiestoornis → articulation disorder
  - spraakontwikkelingsdyspraxie → childhood apraxia of speech
  - dysartrie → dysarthria
- **Research has focused on**
  - Screening, assessment, facilitating analysis by SLTs, treatment and dosage
  - Bilingual children, children with cochlear implants, children with cleft lip and palate
- **Studies (examples)**
  - Speech sound development in typically developing 2- to 7-year-old Dutch-speaking children: A normative cross-sectional study (Van Haaften et al., 2020)
  - Effectiveness of speech intervention in patients with a cleft palate: Comparison of motor-phonetic versus linguistic-phonological speech approaches (Alighieri, Bettens, Bruneel et al., 2020)

Dutch Speech Assessments

- **Computer Articulatie Instrument** [Computer Articulation instrument] (Maassen et al., 2020)
- **NAO** [Nederlands Articulatie Onderzoek] (Baarda,De Boer-Jongsma & Haasjes-Jongsma, 2013)
- **Schaal voor verstaanbaarheid in de context ICS-NL** [Intelligibility in Context Scale: Dutch] (Van Doornik et al., 2013)
- **Fonologische analyse van het Nederlands FAN 2.0** [Phonological analysis 2.0] (Beers, 2022)
- **Klank Analyse Tool (KAT)** [Speech sound analysis tool] (Auris, 2023)
- **Metaphon** (Leijdekker et al., 2005)
- **SNEL taalscreening** [Language Screening] (Luinge 2005)

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Speech Interventions

- **FonoLog** [phonological intervention] (Dijkstra-Buitenhoek & Van den Engel-Hoek, 2019)
- **Hodson & Paden** [Cycles approach] (Hodson & Paden, 1991)
- **Metaphon** (Howell & Dean, 2000; Dutch translation by Leijdekker, 2002)
- **LogoArt** [articulation therapy] (van Riper, 1972)
- **Core Vocabulary Therapy**
  (Chapter in Dutch handbook by Waelkens, 2017)
- **Dyspraxieprogramma** [early version of Nuffield Dyspraxia Program] (Erlings-Van Deurse et al., 1993)
- **ReST** [Rapid Syllable Transition Treatment]
  (Chapter in Dutch handbook by Waelkens, 2017)
- **DTTC** [Dynamic and Tactile Cueing]
  (Chapter in Dutch handbook by Waelkens, 2017)
- **PROMPT** [Prompts for Restructuring Oral Muscular Phonetic Targets]
  (Dutch translation by Raaijmakers & van der Meulen, 2005)

Reference

Book chapter

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Presentation

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  - Sharynne McLeod and Helen L. Blake, Charles Sturt University, Australia