Research Trends in Childhood Apraxia of Speech

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Research Trends in CAS

- Increased rate of genomic findings
- Increased support for auditory-perceptual encoding deficits as a core feature
- Increased support for speech as domain-general
- Incremental mean differences rather than bimodal distributional findings
- Identification of speech, prosody, and voice signs with moderate diagnostic accuracy

Research Trends in CAS
Increased Rate of Genomic Findings[a]

- *FOXP2:*
  - New *FOXP2 family* (Rice et al., 2011)
  - New downstream genes (Roll et al., 2010; Peter et al., 2011)
  - New mammalian and avian models
  - New projects in evolutionary biology
- *FOXP1:*
  Carr et al. (2010); Hamdan et al. (2010); Horn et al. (2010); Pariani et al. (2009)
- *FOXG1:*
  Brunetti-Pierri et al. (2011)
- *ELP4:*
  Pal et al. (2010)
- *RAI1:*
  Kogan et al. (2009)

[a] Some recent literature reviews: Bishop (2009); Fisher & Sharff (2009); Grigorenko (2009); Ramus & Fisher (2009); Newbury & Monaco (2010); Shriberg (2010)

Research Trends in CAS
Increased Rate of Genomic Findings

	Childhood Apraxia of Speech (CAS)	Apraxia of Speech (AOS)
Onset	Congential or acquired during the developmental period for speech-language	Acquired after the developmental period for speech-language
Source	Genetic; epigenetic; neuropathology	Neuropathology
Type	Syndromic or nonsyndromic Hereditary (germ line) or sporadic (de novo) Environmental	Pure or mixed neurogenic
Loci	More widespread loci Example: *FOXP2* Bilateral gene expression Variable degree of haplotype insufficiency Regulation of other genes (e.g., *CNTNAP2*)	More constrained loci

Research Trends in CAS
Increased Support for Encoding Deficits as a Core Feature

- The signature feature in both AOS and CAS is a deficit in transcoding (planning/programming)
- In CAS, there is continuing genetic, neurocomputational, and other support for an additional core deficit in auditory-perceptual encoding
  - Hoit-Dalgaard et al. (1983); Bridgeman & Snowling (1988); Marion, Sussman, & Marquhardt (1993); Groenen & Maassen (1996); Alcock et al. (2000); Maassen (2002); Maassen et al. (2003); ASHA (2007); Nijland (2009)

Research Trends in CAS
Increased Support for Speech as Domain-General

- Domain-Specific: Numerous perspectives supporting this perspective in motor speech and AOS literatures
- Domain-General: Robin and colleagues (Ballard; Maas)

Support for Domain–General accounts of both SD and CAS:

- Participants with Speech Delay score lower on motor tasks (numerous papers)
- Participants with CAS score lower on motor tasks (e.g., Alcock et al., 2000a; Vargha-Khadem et al., 1995)
- Frequent co-occurrence of other forms of apraxia in CAS (e.g., oromotor [e.g., *FOXP2*]; occulomotor [e.g., Joubert's syndrome]; Shriberg, 2010)

Research Trends in CAS

Incremental Mean Differences Rather than Bimodal Distributional Findings

- Acoustics
  - Nijland (2009)
- Electro-magnetic midsagital articulography
  - Terband et al. (2011)
- Electropalatography
  - Morgan et al. (2005)
- Electrophysiology
  - Froud & Khamis-Dakwar (2011)
- (Neurocomputational modeling)
  - Terband et al. (2011)
- (Neuroimaging)
  - Tkach et al. (2011)
- Parent Reports (descriptive, retrospective, sensory scaling; other)
  - Highman et al. (2008); Newmeyer et al. (2009)

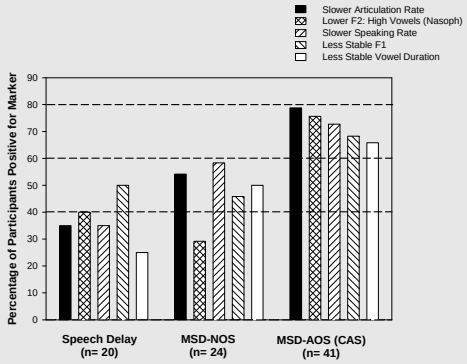
Research Trends in CAS

Identification of Speech, Prosody, and Voice Signs With Moderate Diagnostic Accuracy[a]

From 10 Linguistic Domains	Signs		Reference
	Precision	Stability	
1. Vowels	Imprecise Diphthongs Distorted Substitutions		Shriberg, Fourakis, et al. (in preparation) Shriberg, Jakielski, & Strand (2010)
		Less Stable F1 Less Stable Vowel Duration	
4. Phrasing		Less Variant Speech Durations	Shriberg, Green, et al. (2003)
5. Rate	Slow Speech Rate Slow Articulation Rate		Shriberg, Potter, et al. (2011)
6. Stress	Inaccurate Lexical Stress		Shriberg, Campbell, et al. (2003)
10. Resonance	Lower F2-High Vowels (Nasopharyngeal)		Shriberg, Jakielski, & Strand (2010) Shriberg, Aram, & Kwiatkowski (1997)

[a]Diagnostic accuracy based on between-group comparisons of participants with CAS and participants with Speech Delay.

Each of the 'Top 5' Markers of CAS to Date Assess Vowels[a]



[a]Shriberg, Strand, Jakielski, & Potter (2010)

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Thanks . . .

http://www.waisman.wisc.edu/phonology/

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