Understanding Apraxia in Children with Down Syndrome

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Speech Disorders and DS

- Isn’t it just “Down syndrome speech?”
- What’s the difference between each disorder?
- Why do some children have very clear speech?
- Does the type of speech disorder even matter?
Speech Influences in DS

- Smaller than average oral cavity (giving the impression of a larger tongue)
- Hypotonia of the muscles around the mouth
- Fusion of the lip muscles
- Extra lip musculature
- Neurological differences contributing to reduced speed and range of movement
- Phonological errors
Video (Removed)
Research and Speech

• How does research help us treat a child’s speech disorder?

• How do we know a certain treatment is best?

• How do I know if I am choosing the right intervention methods?
Articulation Disorder: Diagnosis

- **Diagnosis:**
  - One or a few sound errors
  - A child may substitute the “y” in the word *yes* with a /w/ changing the word to “wes”
  - Even a few errors may make it hard for people to understand your child
Articulation Disorder: Cause

• Largely unknown

• In children with Down syndrome this may be related to:
  – Structural differences in the mouth
  – Persistent ear infections or fluid-filled ears
  – Other health problems that interrupt development

• Is different from dysarthria (muscle weakness), apraxia (muscle coordination), or phonological disorder
Articulation Disorder: Treatment

• Treatment:
  – Show how to produce the sound correctly
  – Teach the child to recognize correct and incorrect sound productions
  – Practice sounds

Link: [Articulation Disorders and Treatment](#)
Phonological Disorders: Diagnosis

• This disorder is related to the *rules of speech production*
• Children naturally simplify speech as they are learning to talk – this is called using *phonological processes*
• Eventual replacement of this child-like form in typical development
• Continued use of processes may lead to a phonological disorder diagnosis
Phonological Disorders in DS

- A language disorder in speech’s clothing
Phonological Disorders in DS

• Not related muscle weakness or poor coordination
• Difficulty organizing sounds and understanding the *rules* that govern their production
• Ultimately a *language* problem
• Techniques that focus on strength or coordination often prove ineffective when trying to improve speech accuracy
Phonological Disorders: Treatment

- Therapy targets each process or class of sounds

- Starts with group of sounds that mature or are established first
Apraxia in DS: Diagnosis

• Motor speech disorder
• It is not due to muscle weakness
• Brain has difficulty planning the movements of the muscles that create speech
• Other signs of apraxia include:
  – Limited consonant and vowels
  – An appearance of ‘groping’ movements
  – Inconsistent sound errors that are not the result of immaturity or other speech disorder
“The possibility of dyspraxia as a diagnosis in DS has been little investigated.”
“...Impaired motor function is not due to cognitive delay, but is a syndrome-specific impairment, which may lead to speech disorder. ...the speech disorder in DS is not related to cognitive or language level.” Cleland, et all, 2009

Link: Apraxia
Incidence

- 1 in 1000 or 3-5% of preschoolers with speech disorders
- DS – 15% or 243 in 1620 (Kumin, 2006)
“Speech disorder in DS not wholly accounted for by phonological delays/disorders or hypotonicity...the children do present with difficulties in motor planning and programming.”

Cleland et al, 2010
Apraxia and DS

- Difficulty achieving and maintaining articulatory configurations
- Limited consonant and vowel repertoire
- Presence of vowel distortions
- Use of simple syllable shapes

- Groping
- Inconsistent Errors
Apraxia and DS

- Difficulty with motor and linguistic processing
- Impairments of language and motor systems
- Motor deficits influence the development of phonology and other language processes
Treatment Planning

- Determine the relative contribution of language to motor deficits
Precursors to motor learning

- Development of trust
- Motivation
- Attention – maintenance and effort
Challenges to motor learning in DS

- Processing speed
- Working memory
- Attention
- Receptive language
Interest = Attention

• Use motivating toys (dolls, puppets, action figures)
• Changing positions
• Change inflection (once child has accurate movement and rate)
  – Sing - Vary pitch
  – Vary intonation - Vary emotion
  – Exaggerate
Treatment Approach in DS

• Use an techniques that capitalize on visual learning
Treatment Approach in DS

• Start with limited number of stimuli
• Model
• Child imitation
• Slow rate of speech (increases sensory motor feedback)
• Use tactile cues as needed
• Type of practice (block vs. random)
• Knowing when to choose targets based on sounds or sound classes
Choosing your stimuli

- Length
- Sound complexity
- Syllable shape (e.g. CV, VC, CVC, CVCV, etc.)
- Real or non-sense?
Apraxia in DS

- Videos
How do I get them to work???
Stress Reduction Kit

Directions:
1. Place kit on FIRM surface.
2. Follow directions in circle of kit.
3. Repeat step 2 as necessary, or until unconscious.
4. If unconscious, cease stress reduction activity.
Developing Treatment
LIGHT BULB
Talking is fun!

- Practical ideas for carry-over of speech therapy at home (AKA distributed practice)
  - Car time
  - Daily routines
  - Tokens
  - Game time
  - Containers
  - Phone
  - Echo Microphone
Toys for treatment

- Bubbles
- Balloons
- Bowling Set
- Launchers (hot wheels, motorcycles, wind-up toys)
- Ball and Hammer toys
- Blocks
- Elefun
- Play Dough
- Potato Head
- Puzzles

- Rice/Beans/Pasta Container
- Phlat Ball
- Plastic Food
- Play Farm with animals
- Doll House
- Dolls
- Trains
- Candy Land Castle
- Lucky Ducks
Sign Language

• Do you know Rachel, Alex, & Leah?

• Dual modality (sign and speech)↑recognition of vocab words
  
  Raining Bird, 2000

• Sign is an unaided system and involves direct communication with turn taking and eye contact

  Clibbens, 2001
How old is too old for therapy?

• Considerations
  – Hearing status
  – Motivation
  – Stimulability
  – Motivation
  – Working on communication strategies
  – Motivation
  – Family support
  – Frequency and duration of therapy
Oral Motor and DS
Oral Motor and DS

- What can it hurt?
- Aren’t I waking up muscles needed to talk?
- What if I use oral motor along with more traditional therapies?
Before and After

- Images removed
Oral Motor Update

• Negative affect reported when using a combination approach including oral motor treatment and traditional approaches

• Had therapy only focused on speech sound development, these children probably would have shown progress much sooner.

(In research with cleft palate)
“In our quest to help … we are always looking for the newest and best treatments… Although many of these treatments are valid and have potential use, many others advertised may not live up to their promised result.”

ASHA Leader, July 5, 2011
What if my child still doesn’t talk?

- Augmentative Communication (AC)

- Will AAC prevent speech from developing?

- Benefits of AC or other forms of assistive technology (AT)
How do I address plateaus in my child’s speech?
“Clearly more research is needed to clarify the exact nature and origin of the speech disorder in DS in order to design appropriate interventions.”

Cleland, et al 2009
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