Caterpillar Passage

Courtney Ciulla, Tanya Ibarra, Laura Litzenberg, Sam Kirby
Background

- Purpose of Motor Speech Eval is to identify, differentiate, and rate the severity of impairment
- Motor speech assessed at various levels of complexity
  - From syllables to connected speech
  - Contextual speech most useful for integrated function
- Benefits of speaking passages
  - Controlled and repeatable (to tax the speech mechanism)
  - Gives clinician context
  - Can analyze speech sounds and suprasegmental aspect of speech
Passages

- There are a variety of passages reported in literature
- “My Grandfather” passage - most well known and used
  - not suited for examining speech motor skills that differentiate between motor speech disorders
  - Originally used for the purpose of perceptual characteristics of dysarthria
- “The Caterpillar” passage
  - Developed to augment motor speech assessment protocol
  - Passage utilizes skilled speech tasks to identify motor speech impairment
Do you like amusement parks? Well, I sure do. To amuse myself, I went twice last spring. My most MEMORABLE moment was riding on the Caterpillar, which is a gigantic roller coaster high above the ground. When I saw how high the Caterpillar rose into the bright blue sky I knew it was for me. After waiting in line for thirty minutes, I made it to the front where the man measured my height to see if I was tall enough. I gave the man my coins, asked for change, and jumped on the cart. Tick, tick, tick, the Caterpillar climbed slowly up the tracks. It went SO high I could see the parking lot. Boy was I SCARED! I thought to myself, “There’s no turning back now.” People were so scared they screamed as we swiftly zoomed fast, fast, and faster along the tracks. As quickly as it started, the Caterpillar came to a stop. Unfortunately, it was time to pack the car and drive home. That night I dreamt of the wild ride on the Caterpillar. Taking a trip to the amusement park and riding on the Caterpillar was my MOST memorable moment ever!
Methods: Development

• Criteria Used:
  ○ Passage length that was suitable to achieve clinical efficiency
  ○ Comprehensive phonotactic coverage to examine speech repertoire
  ○ Words/sentences that examine respiration, phonation, prosody, articulation and resonance
  ○ Insertion of isolated speech motor tasks for a comparison with connected speech
  ○ Contemporary vocabulary and simple syntax as to not overload cognition, and focus on speech production abilities

• Compared to “My Grandfather” passage to make sure it was comparable among basic dimensions
Comparing “My Grandfather” and “The Caterpillar”

Both passages were found as being comparable in:

1. Phonetic repertoire in concise passage length
2. Syllable to word ratio
   a. Composed of monosyllabic and multisyllabic words.
   b. Purpose is to tax the speech system
3. Overall Reading level
   a. High frequency words
   b. Purpose is to examine motor speech NOT cognitive or reading ability
Differences between “My Grandfather” and “The Caterpillar”

“The Caterpillar” was designed to build upon “My Grandfather”

- Includes tasks that examine deficits within and across the subsystems of speech
  - Example: adding sentences of varying length to assess breath support and fatigue
- Uses complex words to assess range of sound classes
- Inclusion of a nasal sentence vs oral sentence to assess velopharyngeal function
- Inclusion of tasks that required prosodic variability (e.g., statements vs questions)
- Inclusion of tasks that look at motor planning
  - Includes: words of increasing length, repeated words, and complex words. Important for Apraxia
Participants

- 15 adults (8 men; 7 women) with motor speech impairments
  - Mean Age: 51 years
  - 10 diagnosed with dysarthria (DYS)
  - 5 diagnosed with apraxia of speech (AOS)
    - Acoustic Data of one not included
- 7 healthy participants (2 men; 5 women)
  - Mean Age: 41 years

All participants:

- English speakers, adequate hearing and cognitive skills
- Reading at 5th grade level or higher
Procedure

- Audio recording of each participant
- Analyzed in Praat and perceptually measured
- Measured many different characteristics including overall passage reading rate (words/second), frequency of pauses, and variation of fundamental frequency and intensity

Interjudge Reliability (between 2 investigators)

- Recoding 10% of acoustic tokens ($r = 92.3$)
- 13% of perceptual tokens (agreement = 97.6%)
Results

- Turn to Figure 2 (page 6) and Figure 3 (page 7)
  - Participants along the bottom
  - Each measurement/characteristic on the left
  - Variable individual differences
  - No clean cluster of characteristics to differentially diagnose subtypes
- “The Caterpillar” is more relevant to today than “My Grandfather”
Limitations

- Relatively small number of participants
- Did not include other types of dysarthrias (hyperkinetic, hypokinetic, ataxic)
  - Didn’t define the components of mixed dysarthria
- Passage results did not differentiate between dysarthrias
- Did not actually run statistical analysis
  - Not compared/contrasted to “my grandfather”
  - Not compared/contrasted to healthy clients
- Did not provide criteria for severe, moderate, and limited prosody errors
- Did not go into detail about errors made within characteristics measures (e.g., which words were in error/revised/inconsistent)
The two groups were not matched evenly in number of participants or age. Does this matter?

Since no statistical analyses were conducted, is it fair to say that “The Caterpillar” is a better passage than “My Grandfather”? Why or Why not?

Why would you use “The Caterpillar” passage?

The study intended to create a passage that would differentiate between dysarthrias, but results showed that it really did not succeed in doing that. Why do you think that is? Was there something wrong with how they setup their study? Is it because of the degree of overlap with all types of dysarthria?
You wished to know all about my grandfather. Well, he is nearly 93 years old; he dresses himself in an ancient black frock coat, usually minus several buttons; yet he still thinks as swiftly as ever. A long, flowing beard clings to his chin, giving those who observe him a pronounced feeling of the utmost respect. When he speaks, his voice is just a bit cracked and quivers a trifle. Twice each day he plays skilfully and with zest upon our small organ. Except in the winter when the ooze or snow or ice prevents, he slowly takes a short walk in the open air each day. We have often urged him to walk more and smoke less, but he always answers, “Banana oil!” Grandfather likes to be modern in his language.
You wish to know about my grandfather. Well, he is nearly 93 years old, yet he still thinks as swiftly as ever. He dresses himself in an old black frock coat, usually several buttons missing. A long beard clings to his chin, giving those who observe him a pronounced feeling of the utmost respect. When he speaks, his voice is just a bit cracked and quivers a bit. Twice each day he plays skillfully and with zest upon a small organ. Except in the winter when the snow or ice prevents, he slowly takes a short walk in the open air each day. We have often urged him to walk more and smoke less, but he always answers, "Banana oil!" Grandfather likes to be modern in his language.