LING 190 Module 7: Speech Disorders

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0.1. Disordered Speech

- What are the most common speech disorders?
- We want to understand the causes (etiology) and patterns of occurrence (epidemiology) of speech disorders.

0.1.1. Lecture Overview

- Definitions and types
- Details about a few interesting/common speech disorders
  - Stuttering
  - Cleft palate
- Alternate modes of speaking (related to speech disorders)
  - Creating new ways of speaking that are relevant for certain types of speech disorders

1. Definitions and Types

- Basic categories of speech disorders
  - Definitions:
    - Fluency disorder
    - Motor disorder
    - aphasia
    - voice disorder

1.1. Fluency Disorder

A problem with the fluidity of speech:

- Smoothness, tempo, appropriate placement of pauses
- Degree/amount of false starts and repetitions

- Proficiency in language does not necessarily mean fluency
- There is both inter- and intra-speaker variability: some people are more fluent than others, and this differs from occurrence to occurrence
- One example of a fluency disorder is **stuttering** or **stammering** (in British English)

1.2. Motor Speech Disorder

- Speech disorders that result from neuro-muscular problems controlling articulators in the vocal tract.
  - Repetition or prolonging words
  - Results in transient, strained, speech
  - Commonly includes variable speech rates
- **Dysarthria**
  - Speech rate is very slow
  - Problems with articulation, difficulty with clear articulation
  - The voice quality is affected as well
  - Loss of speech intelligibility
  - Causes:
    - Congenital problems (developmental disorders like ALS or cerebral palsy)
    - Acquired problems (such as strokes, brain injuries, etc.)
- **Apraxia**
  - Closely related to dysarthria
  - More related to the programming or planning of speech
  - Substituting incorrect sounds
  - Causes:
    - Congenital problems (developmental disorders like ALS or cerebral palsy)
    - Acquired problems (such as strokes, brain injuries, etc.)

1.3. Voice Disorders

- Problems with the larynx's role in the production of speech
  - Hoarse voice, inability to produce modal voice, inability to control pitch, etc.
- **Examples:**
  - Spasmodic dysphonia: When the muscles controlling the vocal folds will seize up/ spasm
  - There are different types of spasmodic dysphonia, including:
    - Abductor Spasmodic Dysphonia
    - Adductor Spasmodic Dysphonia
  - Vocal polyps/nodules

1.4. Aphasia

- Definition: Total or partial loss of the cognitive function of language
  - These are speech problems that are not related to motor or voice disorders
- Examples:
  - Broca's aphasia (problems producing speech)
    - In Broca's aphasia, the patient is aware of their problem

- Wernicke's aphasia (problem interpreting speech)
  - However, in Wernicke's aphasia, the disorder is often accompanied with a lack of awareness of the problem.
  - Sometimes called fluent aphasia

2. Interesting/Common Speech Disorders

- Additional information about these two speech disorders
  - Stuttering
  - Cleft palate (Not quite a speech disorder, but probably best classified as a motor speech disorder)
- Further information about etiology, treatment, etc.

2.1. Stuttering

Stuttering is a fluency disorder (not necessarily a problem with language proficiency). It's characterized by an involuntary repetition, delay, or not being able to produce sound.

2.1.1. Types of Stuttering

- **Developmental**: stuttering with a gradual onset during childhood; presents as a dysfluency in the timing, patterning or rhythm of speech
- **Neurogenic**: typically the result of nerve or traumatic brain injury
- **Psychogenic**: begins suddenly after emotional truma or stress; also occurs in patients with history of psychiatric illness.
- Stutterers know what they want to say, but have trouble producing the correct speech.

2.1.2. Epidemiology

- More common in younger populations
- 3-4x more common in boys than girls
- 80% of children who stutter will recover by the age of 16 (some will need therapy, others will recover on their own)
- How does one distinguish between normal levels of developing fluency, and pathological dysfluency?
- Many children will stutter, but many children also simply can't speak fluently yet.
  - Children who are stutterers have much more severe behavioral patterns when compared to children who just have developmental dysfluency

2.1.3. Etiology

- poorly understood
- The current theory is a neurologicical and physical dysfunction related to timing in speech production
- There is a genetic basis

2.1.4. Stuttering in Children

- **Treatment**
  - Oftentimes, stuttering can result in secondary issues
  - If parents or other caregivers treat them differently because they stutter, this can lead to other problems
    - For example, bullying, problems regulating emotions, etc.
  - The best way to treat stuttering is to see a speech therapist, who can help with timing speech production, shadowing, etc.

2.2. Cleft Palate (and Cleft Lip)

- Developmental problem where two sides of the body fail to fuse in the:
  - Lip
  - And/or palate
- Can be repaired using surgery

2.2.1. Epidemiology

- One of the most common congenital malformations in the head and neck
- Around 1 in 1,000 live births have cleft lip and/or cleft palate
- There are some sex differences
  - Cleft lip (with or without cleft palate) is twice as common in boys than girls
  - Cleft palate (only) is twice as common in girls than boys

2.2.2. Etiology

- There is a strong genetic component
- There are risk factors during pregnancy: smoking, diabetes, substance abuse, certain medications, etc.
- Correctable with surgery
  - There can be some speech issues associated with the disorder

2.2.3. Treatment

- Surgeries are typical in infancy
- Cleft lip can be done in the first to fourth month of life
- Cleft palate can be done between the 5th and 15th month
- Many people have follow-up surgeries from 2 years up until the teenage years

2.2.4. SLPs and cleft palate issues

- Swallowing and feeding problems
- Toddlers and older children have difficulty with certain articulations
- Velo-pharyngeal insufficiency
  - Problems with keeping the velum open or creating a tight enough seal using the velum to create some type of sounds.
  - Even after surgery, the child may have difficulty with controlling certain parts of the SLVT, especially the velum.

3. Alternative Modes of Speaking

- Two other common phenomena
  - Lisp
  - Other ways of producing speech sounds (in cases of surgery)
- Further information about etiology, treatment, etc.

3.1. Lisp

- "Lisp" is a lay term that refers to certain types of articulations
- Often avoided by professionals
- It is most commonly referred to as a problem with the articulation of certain sounds

Questions

- Is it a disorder?
- Lisps do not cause a loss of speaker intelligibility
- Some children have a lisp temporarily in development
- Some adults are concerned with negative social judgements associated with lisping

3.1.1. Frontal Lisp

- Alveolar fricatives are partly articulated as dental fricatives
- /s/ ends up sounding like /θ/
- /z/ ends up sounding like /ð/
- In many cases, this is only partly noticeable to listeners

3.2. Laryngectomy

- Surgical removal of the larynx due to disease, injury, etc.
- **Laryngectomee** is a person who has undergone a laryngectomy
- Loss of the source (glottis) but the filter (SLVT) remains intact

We want to find different ways to reproduce the source. There are wyas of "replacing" the larynx with some kind of other vibrating device.

Different sources of speech sounds in laryngectomees:

- Esophageal mechanism
  - They may "belch" out speech, and control the esophagus to create some kind of noise.
- External vocal prosthesis
  - An electronic device to the throat that creates vibration in the mouth, then use the SLVT to filter the sound and produce speech.
- In-dwelling (internal) vocal prosthesis
  - Tracheoesophageal speech
  - They cover the stoma, forcing air to go through a one way valve within the prosthesis, and use esophageal tissue to create vibrations.
- Transplanted larynx
  - An extremely rare procedure where a new larynx is implanted