PRAXIS Review Course in Speech-Language Pathology:
Fluency, Fluency Disorders, and Stuttering

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The information in this presentation was compiled by Dr. Derek Daniels
Disclosure

• I receive an honorarium for this presentation.
• I authored a book chapter in a book that I reference later in the presentation.
Important Topic Areas

• Fluency and Different Types of Fluency Disorders
  • Fluency and Disfluency
  • Childhood-Onset Stuttering (sometimes called Developmental Stuttering or Persistent Developmental Stuttering)
  • Neurogenic (or Acquired) Stuttering
  • Psychogenic Stuttering
  • Cluttering

• Childhood-Onset (Persistent Developmental) Stuttering
  • Etiology, Nature, and Characteristics
  • Theoretical Foundations
  • Principles of Assessment
  • Intervention Approaches
Fluency and Disfluency

- Fluency – the forward, smooth, effortless flow of speech
- Fluency consists of
  - Rate
  - Continuity
  - Effort
- Disfluency – interruptions in the forward flow of speech. Everyone experiences disfluency.
- Typical disfluencies (usually less than 3 iterations)
  - Phrase repetitions (I want, I want a drink)
  - Phrase revisions (I need, please hand me that book)
  - Interjections (We, um, we went to the store)
  - These disfluencies result from the speaker trying to formulate a message (i.e., trying to find the right words). This is different from a speaker who knows exactly what they want to say but has motoric difficulty saying it.
  - Sometimes an individual who stutters might repeat phrases or interjections in anticipation of stuttering on the next word.
Childhood-Onset (or Persistent Developmental) Stuttering

- Stuttering is a *neuro-developmental* condition: it arises during childhood because of atypical growth and development of the central nervous system (Smith, 1999; 2017).
  - Genes – fixed at birth
  - Epigenesis (epigenetics) – the timing and intensity of gene expression
  - Experience – developmental, psychosocial, environmental.

- Stuttering has a largely genetic basis. This affects motor and sensory systems of the brain, which are influenced by environmental demands (Ambrose, 2004).
  - Genetics and Epigenetics
  - Neurophysiology (sensory, motor, and sensorimotor integration systems)
  - Psychological
  - Environmental

- **GENES → BRAIN → BEHAVIOR**


Characteristics of People Who Stutter

• 1) Core behaviors / Primary behaviors / Stutter-like disfluencies (SLDs)

  • Part-word (sound/syllable) repetitions: repeating sounds or syllables (3 iterations or more) of words (p-p-pizza, g-g-g-green, ba-ba-ball)

  • Single syllable whole-word repetitions: repeating a single-syllable whole word of usually more than iterations (my-my-my teddy bear)

  • Prolongations: prolonging a sound usually more than 1 second; the sound or airflow continues but movement of the articulators is stopped (sssssnake, pleeease)

  • Blocks: a temporary stoppage of airflow (laryngeal or articulatory) (l__ike, n__ame, __pizza)

Characteristics of People Who Stutter

2) Coping strategies / Secondary behaviors / Accessory behaviors: learned behaviors that are triggered by anticipating stuttering, or by the experience of stuttering.

As stuttering continues to develop, children are likely to develop reactions to it. Some of these include:

- Muscle tension (face, jaw, lips)
- Rising intonation
- Struggle
- Physical concomitants (heads nods, hand movements)
- Circumlocutions
- Tongue clicking

Categories of Secondary Behaviors

• **Escape** – behaviors that occur when the speaker is in the moment of stuttering and tries to terminate, or escape, the stutter. Example: a person nods their heads several times to try and stop the stutter and continue the word.

• **Avoidance** – behaviors that occur when the speaker anticipates a stutter and tries to avoid it from happening. Example: A speaker might say a different word for fear of stuttering on the intended word.

Characteristics of People Stutter

3) Feelings and Attitudes

- Different emotions, beliefs, and forms of self-talk that are created in the speaker from the experience of stuttering.
- These vary among people who stutter.
- If these are negative or self-defeating, then it is important that you address these in therapy.
The ABCs of Stuttering

• **Affective Components** – how do I **feel** about myself and my speech

• **Behavioral Components** – what linguistic and/or physiological **speech patterns** do I exhibit

• **Cognitive Components** – what **thoughts** have I developed about my stuttering.
Sheehan’s Iceberg Illustration

- Stuttering has both overt and covert components.
- The overt and covert components of stuttering.
- Overt – everything that’s observable; what you can see and hear.
- Covert – not observable; what you cannot see and hear.
Characteristics of Stuttering

• Prevalence (how many people currently have this disorder): Approximately 1% of the general population (approximately 3 million people in the US)

• Incidence (how many people have stuttered at some point in life): Approximately 5% of the general population

• Onset: Stuttering usually emerges between the ages of 2 and 6, a time when language is rapidly developing. The onset can be gradual or sudden.

• Genetics: Stuttering is more frequent in males than females. In young children, the ratio is approximately 2:1. In older children and adults, the ratio is approximately 4:1. Stuttering often runs in families.
Characteristics of Stuttering

• As many as 80% of children who begin to stutter will recover without treatment.

• Intelligence: People who stutter do not differ in levels of intelligence from people who do not stutter.

• Concomitant disorders: Stuttering can co-occur with other communication disorders, such as phonology and language.

• Brain differences: Research suggests that people who stutter exhibit different brain activity patterns during moments of stuttering (often showing more activity in the right hemisphere during stuttered speech).
Characteristics of Stuttering

• Adaptation effect – the idea that a person’s fluency will increase up repeated readings of the same passage.

• Consistency effect – the idea that if a person reads the same passage, they are likely to stutter on the same words as before.

• Expectancy (anticipation) effect – the idea that a person can predict which words they will stutter on.

Characteristics of Stuttering

- Spencer Brown (1945)
- Stuttering often occurs at the beginning of words and utterances
- Stuttering often occurs on longer and more grammatically complex utterances
- Stuttering often occurs more on stressed syllables
- Stuttering severity may vary with different types of social situations and communicative intents (or speech acts)
Delayed Auditory Feedback (DAF) and Frequency Altered Feedback (FAF)

• Stuttering diminishes (or disappears) under certain conditions. These include:
  • Singing
  • Speaking in unison
  • Choral reading
  • Talking with a metronome
  • Talking in the presence of noise
  • Talking under delayed auditory feedback (DAF)
  • Talking to pets or babies
  • Adaptation effect

• Stuttering increases under various types of pressures and linguistic demands.
• Delayed auditory feedback (DAF) – delaying the timing and/or duration of an auditory signal (usually via headphones or an electronic device).
• Frequency altered feedback (FAF) – changing the frequency of an auditory stimulus (usually via headphones or an electronic device).
Cluttering

• The person is speaking at a rate that is too fast for their system to handle. It’s not just speaking too fast.

• When a person speaks too fast (than their system can handle), there’s a breakdown in the clarity of sound production – this is cluttering.

• Perceived rapid and irregular rate

• Sudden bursts of rapid speech that is difficult to understand and somewhat disfluent

• May have an excess of normal disfluencies, collapsing syllables, deleting syllables, and atypical pauses

• People who clutter do not clutter all the time. These speech behaviors only need to happen enough to disrupt effective communication.
Cluttering

• Be sure to rule out:
  • Covert stuttering
  • Stuttering-like disfluencies
  • Language-based disfluencies

• When they speak at a rate that their system can handle, their speech sounds more typical.

• With effort and attention, the speaker may be able to speak without cluttering
  • Example: Does adding pauses help?
Neurogenic (Acquired) Stuttering

• Caused or exacerbated by neurological disease or damage, such as stroke, head trauma, brain injury, tumor, or neurodegenerative diseases.

• Typical onset is after childhood
Characteristics of Neurogenic Stuttering

• Stuttering tends to occur more on function words as well as content words.
• Stuttering is not restricted to initial syllables of words.
• Relatively few secondary behaviors
• Little to no adaptation effect
• Little to no reduction of stuttering under fluency-inducing conditions
• Relatively little fear and anxiety

THEORETICAL FOUNDATIONS OF CHILDHOOD-ONSET (PERSISTENT DEVELOPMENTAL) STUTTERING
Past Theories

- Physiological
  - Stuttering is caused by a physical (or structural) defect.

- Psychological
  - Stuttering is caused by an underlying weakness in the psyche.
Past Theories

• **Cerebral dominance theory:** Introduced by Samuel Orton and Lee Travis
  • An organic theory of stuttering
  • Stuttering occurs as a result of confused hemispheric control
  • It is caused by switching handedness (which is not true!)
  • It is a neurological condition.

• **Diagnosogenic theory:** Introduced by Wendell Johnson
  • Stuttering is caused when people react to the label of stuttering.
  • A learning theory of stuttering
  • Stuttering is caused when parents mistakenly label a child’s *normal disfluencies*.
  • Stuttering emerges when the child tries to avoid normal disfluencies
  • Stuttering is learned.
  • None of these ideas are true!
Past Theories

• **Approach-Avoidance:** Introduced by Wendell Johnson and Joseph Sheehan
  • People who stutter are caught between drives to speak and drives to avoid speaking.

• **Anticipatory Struggle:** Introduced by Oliver Bloodstein
  • People stutter because they develop a belief that speech is difficult.
  • When people who stutter anticipate difficult words, they predispose themselves to stutter by putting their speech musculature in a tense state before uttering the feared word. (Think about this in relation to how you approach a feared situation).

• **Auditory-Perceptual**
  • Stuttering is caused by deficits in the auditory feedback system
Past Theories

• Genetics
  • Twin studies
    • Concordance / discordance
  • Adoption studies
  • Family studies
What Do We Currently Know?

• *Stuttering is multifactorial.* Advocates of multifactorial frameworks contend that stuttering is too complex of a problem to be viewed from singular etiology.
Multifactorial Perspectives

• Demands and Capacities (Starkweather)
  • Speech performance demands exceed a person’s capacity for fluency.
    • Motor
    • Social
    • Cognitive
    • Emotional
    • Linguistic
Demands-Capacities Model
(Starkweather & Gottwald, 1990)

Stutter events arise when various *demands* exceed the speaker's *capacities* for fluent speech. For example, a child attempts speech performance beyond their abilities.
Returning To Our Current Thinking

• Stuttering is a *neuro-developmental* condition: it arises during childhood because of atypical growth and development of the central nervous system (Smith, 1999; 2017).
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• GENES ➔ BRAIN ➔ BEHAVIOR


PRINCIPLES OF ASSESSMENT
Risk Factors Associated With Stuttering

- These are important for evaluating young children who stutter
  - Family history of stuttering (genetic component)
  - Longer time since onset (>6 months)
  - High degree of reactivity (temperament)
  - Concomitant speech and language disorders
  - Gender
  - Signs of tension and struggle while speaking
  - Stuttering behaviors progressively increase
  - Secondary behaviors are present
  - The child is aware and concerned
  - Parent concern
Assessment of Young Children (below the age of 6)

• Thorough case-history
  • Probe for risk factors

• Parent input

• Standardized measures
  • Speech and language tests
    • Test of Childhood Stuttering (ages 4 through 12)
    • Stuttering Severity Instrument (can be used for all ages)
    • A language measure (such as the Preschool CELF)
    • A measure of articulation and phonology (such as the Goldman-Fristoe)

• Non-standardized measures
  • Narrative samples across contexts
    • Story retell
    • Story generation
  • Observations of parent and child
Assessment of School-Age Children and Teens

- Thorough case-history
- Parent and teacher input
- Client interview (**how is stuttering an adverse impact for the client**)
- Standardized measures
  - Speech and language tests
    - Test of Childhood Stuttering (ages 4 through 12)
    - Stuttering Severity Instrument (can be used for all ages)
    - A speech and language screen (evaluate if necessary)
  - Impact
    - Overall Assessment of the Speaker’s Experience of Stuttering (OASES): School-Age Version (7-12) and Teens Version (ages 13-17)
    - Communication Attitudes Test
    - Behavior Assessment Battery
- Non-standardized measures
  - Narrative samples across contexts
  - Story retell
  - Story generation
Assessment of Adults

• Thorough case-history
• Client interview (**how is stuttering an adverse impact for the client**) 
• Standardized measures
  • Speech and language tests
    • Stuttering Severity Instrument (can be used for all ages)
  • Impact
    • Overall Assessment of the Speaker’s Experience of Stuttering (OASES): Adult Version
    • Wright and Ayre Stuttering Self-Rating Profile (WASSP)
    • Modified Erickson Scale
    • Perceptions of Stuttering Inventory
Important Diagnostic Questions

• Is this childhood-onset stuttering (sometimes referred to as developmental stuttering), normal disfluency, or another type of fluency disorder?
  • What are the client’s linguistic and motoric patterns of behavior?
  • What factors influence these patterns of behavior?

• What is the history?

• What choices is the client making because they stutter?
  • How does the client think and feel about communication?
  • What are the client’s present coping strategies?
  • Does stuttering negatively impact quality of life?
Diagnostic Criteria

• Behavioral: Type, Frequency, Duration, Severity.
  • 3 or more core behaviors per 100 words
  • 3 or more iterations of a disfluency (e.g., p-p-p-pizza)
  • Duration of longer than 1 second
  • Speech rate
    • Location of stuttered disfluencies
• Secondary behaviors and coping strategies
• Associated speech and language problems
• Reactions to stuttering
• **Adverse impact**
Diagnostic Considerations

• Remember: Stuttering is more than stuttering
• What are the contributing etiological factors?
  • Stuttering is “built-in”
• What are the person’s observable behaviors
  • You may not always see them
• Remember that stuttering has overt and covert components.
• What are the person’s ABC’s? How do other people react to the person’s stuttering?
• What is the overall impact?
• Preschool children: are they at risk for continuing to stutter?
• Older children and adults: How is stuttering affecting them at the present time?
Does the child need therapy?

• Consider “watchful waiting” if:
  • The child’s behavioral severity of stuttering is mild
  • Parent concern is not great
  • Onset within a few months
  • Child is younger than 3.5 years
  • Not many risk factors present (such as family history of stuttering, concomitant disorders, secondary behaviors, reactions to stuttering, etc)
Does the child need therapy?

- Consider therapy if:
  - The child is older than 3.5 years
  - The child has been stuttering for more than 6 months
  - The child is concerned about stuttering
  - Parents are concerned
  - High risk factors involved (especially family history)

- For children who don’t have a documented family history of stuttering, an evaluation of their phonological skills can be important for deciding whether or not child needs therapy.
  - BBTOP
  - Nonword repetition tasks
PRINCIPLES OF INTERVENTION
Young Children (below the age of 6)

• Therapy can be indirect or direct

• Indirect therapy - for children who exhibit mild behavioral severity, no tension while speaking, no secondary behaviors, and minimal to no negative reactions to stuttering.

• Direct therapy – for children who exhibit moderate or severe behavioral severity, tension while speaking, secondary behaviors, and adverse reactions to stuttering.
Indirect (or Less Direct) Therapy

• Strategies
  • Parent counseling
  • Parent training
  • Modifying the home environment

• When observing the family interaction patterns, look for:
  • Fast rates of speech
  • Lack of pauses
  • Interruptions
  • Frequent open-ended questions
  • Frequent criticisms or corrections
  • Inconsistent listening
Direct Therapy

• Principles
  • Explain the concept
  • Give them a model
  • Have them say if after you

• Strategies
  • Slightly reduced rate (pausing)
  • Easy talking
  • Easy starts

• Create a communicative environment that supports the child’s capacities for fluency.
  • Easy, relaxed speech (Mr. Rogers)
  • Rephrasing
  • Turn-taking
  • Resisting time pressure
  • Listening/Attending
Therapeutic Programs for Young Children (Ages 6 and below)

• Remember that therapy is always individualized!
• Palin Parent-Child Interaction (PCI)
• RESTART (Demands and Capacities)
• Lidcombe
• Comprehensive Treatment Program (Yaruss)
Intervention for Older Children (ages 7 and older) and Adults

• Steps in the treatment process (based on Van Riper’s model):

  • Education – learning about speech and stuttering
  • Identification – identifying core behaviors, secondary behaviors, and associated thoughts and feelings
  • Desensitization - feeling more comfortable in difficult speaking situations
  • Modification – making changes to speech behaviors
  • Stabilization – helping changes in therapy to become more automatic
  • Generalization – helping the changes to generalize from one setting to another.
 Fluency Shaping

• Easier initiation and flow of speech
• Designed to increase fluency (spontaneous or controlled fluency)
• Very structured
• Easy onsets, light contacts, and reduced rate
  • Easy onsets - Prolong the first sound of words at the beginning of a clause or sentence.
  • Light contacts - Designed to prevent less physical tension on specific sounds. The articulators are brought together with minimal contact.
  • Reduced Rate - Designed to reduce rate to a slightly slower level. Pauses should be inserted in natural places.
Stuttering Modification

• Tension reduction
• Also focused on reducing avoidance behaviors, fear, and anxiety around talking.
• Easy stuttering and voluntary stuttering
• Cancellations, Pull-outs, Preparatory sets
  • Cancellations – Modifying a moment of stuttering after it occurs. Following a moment of stuttering, pause to reflect on where tension occurs, and then repeat the word again with an easy start (slide) or an easy stutter (bounce).
  • Pull-outs - Modifying a moment of stuttering as it is occurring. During a moment of stuttering, reflect on where tension is occurring, and then finish the word in an easier way (i.e., with a bounce or slide).
  • Preparatory sets - Modifying a moment of stuttering before it occurs. Requires an awareness of when you might stutter. Before you say the word, ease into the first sound.
Helpful Resources
My contact information

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