Stuttering

Foundations and Clinical Applications

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Chapter 9: Assessment of Adults and School-Age Children

LEARNER OBJECTIVES

Readers of this chapter will understand:

- The purposes and rationale for the initial evaluation of stuttering and its components.
- Appropriate stuttering evaluation procedures.
- Specific procedures for speech recording and the various methods of disfluency analyses and measures available.
- How stuttering severity is evaluated.
- Administration and scoring of different available scales/checklists/assessment protocols for stuttering.
- How to interpret comprehensive evaluation data, make recommendations for therapy based on assessment results, and prepare professional clinical reports.

General Considerations

Assessment of Stuttering

There is wisdom in the maxim attributed to Charles Kettering that “a problem well-stated is a problem half-solved.” The goal of assessment is to be able to articulate an understanding of the nature of a presenting disorder and associated communication difficulties, so that appropriate treatment objectives and activities may be pursued. One end result of an assessment is a diagnosis, which refers to the identification of a specific condition usually not apparent at the beginning. For example, in medicine, when a patient complains about abdominal pain, the underlying problem must be isolated from the range of possible ailments, such as food poisoning, ulcers, ruptured appendix, cancer, and so on. This is not the case with advanced stuttering, where just about all those who seek professional help state the correct diagnosis, stuttering, when they first contact the clinician. Given this reality, with some qualifications to be addressed next, the main assessment task is that of characterization and quantification of the client’s stuttering and related factors, not the diagnosis of something not readily apparent (Yairi & Ambrose, 2005).
Observations and Examinations: Speech

- Vocal cord movement and function
- Voice quality and consistency
- Articulation and clarity
- Pitch and tone
- Breath control and stamina
- Non-verbal communication
- Expressiveness and engagement

Table 7.1: Continued

For improving speech, consider the following strategies:

1. Practice vocal exercises: Singing, breathing, and pronunciation exercises can help improve vocal cords and articulation.
2. Seek professional help: Speech therapists can provide targeted exercises and techniques.
3. Use technology: Apps and devices can aid in practicing speech and vocal production.
4. Practice regularly: Consistent practice is key to improving speech.
5. Be patient: Improvement takes time and effort.

Another important factor in speech improvement is understanding the emotional and psychological aspects that may influence speech development.
The effects of word length on reading speed and comprehension were examined. In a series of experiments, participants were presented with passages of varying word lengths and were asked to read them aloud at their own pace. The results showed that longer words led to slower reading speeds and a decrease in comprehension. This effect was observed across different genres of text, including fiction, non-fiction, and educational materials. The authors propose that the increased difficulty in processing longer words may be attributed to the cognitive demands of maintaining working memory and allocating attentional resources. These findings have implications for educational practices, as they suggest that educators should consider the word length of instructional materials to optimize learning outcomes.
<table>
<thead>
<tr>
<th>Type of Feature</th>
<th>Sampling Unit</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sharpness</strong></td>
<td></td>
<td>100 x (sharpness)</td>
</tr>
<tr>
<td><strong>Contrast</strong></td>
<td></td>
<td>100 x (contrast)</td>
</tr>
<tr>
<td><strong>Luminance</strong></td>
<td></td>
<td>100 x (luminance)</td>
</tr>
<tr>
<td><strong>Color Saturation</strong></td>
<td></td>
<td>100 x (color saturation)</td>
</tr>
<tr>
<td><strong>Hue</strong></td>
<td></td>
<td>100 x (hue)</td>
</tr>
<tr>
<td><strong>Texture</strong></td>
<td></td>
<td>100 x (texture)</td>
</tr>
<tr>
<td><strong>Edge Detection</strong></td>
<td></td>
<td>100 x (edge detection)</td>
</tr>
</tbody>
</table>

Table 4: The Feature Extraction Sampling Units and Formulas for the Feature Descriptors
Second, there may be practical factors in the choice of unit applied. If the word or syllable information is already available to the examiner (e.g., a reading paragraph), then this can be saved and allotted instead to the analysis process. Third, there may be an interest in the nature of the disfluent speech relative to language or speech planning. Conceptually, the number of words would better reflect the amount of language produced, whereas the number of syllables better reflects the amount of speech produced. The more multisyllabic words used by a speaker, the less the word count reflects the speech motor demands of the utterances. Syllable counts are apt to capture such demands more closely. Finally, the total counts of either words or syllables tend to be more accurate when smaller sections of the speech sample are summed first. For example, next to each line in the transcript, the examiner would record the count of words or syllables, then for each section or page subtotals are derived, and finally the subtotals are added to arrive at the grand total of words or syllables.

**Rules for Syllable or Word Counts**

An essential rule for counting words or syllables in the speech samples of people who stutter is that the count should be based on the number of words or syllables that would have been spoken had there been no disfluent speech. For example, "bu-bu-bu-but" counts as one spoken syllable. Additionally, standard rules for what should and should not be counted as a word or syllable have been offered (Brown, 1973; Guth, 2006; Rutherford, 2000). We suggest the following conventions, adapted from those sources:

1. Repeated, interjected word or phrase segments are not included in the counts.
   
   e.g., "The ba-ba-ba-baby is uh uh crying," has 6 syllables, 4 words.

2. Words that precede or follow revisions are included in the word count.
   
   e.g., "The infant—the baby—is—has been crying," has 11 syllables, 8 words

3. The following are considered to be one word:
   
   a. Expressions like "Oh boy" (2 syllables).
   b. Acronyms like "MTV".
   c. Proper names like "Mary Kay".
   d. Catenative forms such as "gonna" or "hafta".
   e. Ritualized reduplications such as "bye-bye" or "so-so"

Although some clinicians may prefer to exclude unfinished or abandoned words, we usually include any partial words that are still intelligible, counting only the portion that was actually uttered (e.g., "ba-na-" and "stra-" would be 2 syllables + 1 syllable = 3 syllables).

Additional rules ensure that word or syllable counts are not artificially inflated with a preponderance of utterance types that are either atypical, exceedingly short, or a known fluency-enhancing condition. Rules for the types of utterances to exclude from the analysis set are as follows:

- a. Direct quotes (precise imitation) of another person
- b. Words spoken or listed in a series ("One, two, three . . . A, B, C, D . . .")
- c. Words that are sung or automatically recited
- d. Isolated single-word utterances indicating "yes" or "no"
- e. Unintelligible words or syllables

**Disfluency Reference Data**

Appendix 9.1 (see end of this chapter) offers a reference for disfluency type/ frequency data per 100 words for nonstuttering speakers based on two sources. Participants in the Fairbairn and Clifton (1972) study were younger and older adults, males and females combined, who produced narrative speech samples of unspecified length in response to three picture cards. Participants in the White (2002) study were 30 men and women who produced narrative samples on the topics: a typical day in their life, how to drive a car, how to make a favorite meal, and how to change a car tire. Sample size ranges from 300 to 363 words. Note that, except for the category of interjection, the two studies provide reasonably similar data for the young adult. Disfluency data for reading (see Appendix 9.2) are based on the same set of participants in the White (2002) study who read the 331-word Rainbow Passage (Fairbanks, 1960).

The reference data shown in the three appendices (9.1, 9.2, and 9.3) reveal that disfluency frequency in oral reading is typically much less than in narrative tasks. For this reason, if an adult who stutters is prone to stutter when he or she reads aloud, it may be particularly noticeable in contrast to what a normally fluent speaker would do. The White (2002) study also found that disfluency frequency for men was significantly higher than for women.

The only study found to provide disfluency data for nonstuttering adults in a metric per 100 syllables was Roberts et al. (2009). They reported reference data for 30 men from 20 to 51 years of age. The spontaneous speech tasks requested of participants were threefold: the job task, telling about hobbies, and explaining how a sport is played. No significant differences in overall disfluency frequency were found among the three topics or across three sample lengths, 300, 500, and 900 syllables. Based on a significant interaction between length and topic, it was concluded that the first 300 syllables for telling how to play a sport may elicit a higher relative disfluency frequency than samples based on the job and hobbies tasks. A table summarizing these data is shown in Appendix 9.3.

Appendices 9.4 and 9.5 offer reference data for adults who stutter derived from two studies. First, Conture and Brayton (1975) reported disfluency data in oral reading of 17 participants (13 men and 4 women) based on a 500-word sample. Second, Silverman and Zimmer (1979) recorded spontaneous speech samples from 20 participants (10 men, 10 women) with a mean of 965 words for the women and 882 words for the men. Although females produced significantly more part word repetitions,
Table 3: Socioeconomic Data

<table>
<thead>
<tr>
<th>Accessory Features</th>
<th>Ethnicity</th>
<th>Education</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>67%</td>
<td>52%</td>
<td>78%</td>
</tr>
<tr>
<td>Female</td>
<td>33%</td>
<td>48%</td>
<td>22%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note: The table above shows the distribution of accessory features based on gender, ethnicity, and education levels. Income distribution varies widely among different categories.

Socioeconomic Society

Sociocultural differences in socioeconomic status often correlate with the prevalence of certain diseases. Understanding these relationships is crucial for developing effective public health interventions. For instance, higher income levels are associated with better access to healthcare and improved overall health outcomes. Conversely, lower income groups may face challenges in accessing timely medical care, leading to disparities in disease incidence and mortality rates.

In addition to income, other socioeconomic factors such as education and ethnicity also play substantial roles in health outcomes. Educated individuals are more likely to have access to information on healthcare and prevention strategies. Additionally, certain ethnic groups may experience unique health challenges due to historical or cultural factors, emphasizing the need for targeted interventions.

Addressing these inequities requires a comprehensive approach that includes policies aimed at reducing socioeconomic disparities. Investing in early childhood education, improving access to affordable healthcare, and promoting healthy lifestyles through community programs are all critical steps towards achieving this goal. Furthermore, fostering a more inclusive healthcare system that addresses the specific needs of diverse populations can contribute significantly to reducing health disparities and improving overall population health.
Table A: An example of measuring attenuation rate

<table>
<thead>
<tr>
<th>Tissue Type</th>
<th>Attenuation Rate (dB/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone</td>
<td>70</td>
</tr>
<tr>
<td>Muscle</td>
<td>50</td>
</tr>
<tr>
<td>Fat</td>
<td>30</td>
</tr>
<tr>
<td>Air</td>
<td>1</td>
</tr>
</tbody>
</table>

The attenuation rate is measured in decibels per meter (dB/m) and indicates how much the signal strength decreases as it travels through the tissue.
Observations and Examinations Other Domains

(Information, Evidence, Practice, Action 2000)
Interpretation and Treatment Recommendations

Because the process of treatment and intervention in children with autism spectrum disorder (ASD) includes a variety of approaches, such as education, therapy, and medication, it is important to carefully evaluate each approach and develop a comprehensive treatment plan. This plan should be based on the individual needs of the child, and should be developed in collaboration with the child's family and other professionals involved in the child's care.

The treatment plan should include interventions that address the child's specific challenges, such as social skills training, communication therapy, and behavior modification. It is also important to provide the child with opportunities to practice new skills in natural settings, such as during play and social interactions.

In addition to treatment interventions, it is also important to consider the child's overall health and well-being. This may include nutritional support, physical therapy, and other interventions to support the child's growth and development.

Overall, the goal of treatment for children with ASD is to provide a comprehensive and individualized approach that supports the child's unique needs and promotes their overall development and well-being.