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 artic- ulate an understanding of the nature of a presenting disorder and associated com- munication 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).

mature level of self-awareness of emotions and attitudes. Most high school students are able to function similarly but may lack information pertaining to their history. They should be able to respond to most of the case history questions listed later in the chapter. It is obvious, however, that a question about the person's wife or children's reactions to stuttering should be skipped or reworded to fit the particular individual's circumstances. For many children, asking about parents' and siblings' reactions would be more appropriate. The presence of one or both parents is welcome and may be helpful, but it is not essential for the narrow purpose of the evaluation. Relevant missing information may be secured at a later time.

By contrast, a full evaluation of a third grader would greatly benefit from a parent's participation. Many of the case history questions can be answered only by the parent, not only regarding the stuttering history but regarding emotional reactions, social impact, and so on. It is wise to interview the parent alone before talking with the child. Again, a good number of questions from the list can be presented but with altered wording to suit the child's age, apparent behavior, maturity, and intellectual aptitude. It is also important to examine the complete profile of the child's communication abilities (i.e., articulation and language testing), as well as the academic impact of stuttering. In addition to parents, the clinician may need to interview several persons important to the client, such as teachers and professionals who have evaluated or treated the child for stuttering or other communication disorders. In the table of case history questions, presented later, the last section contains extra questions that may be especially relevant for school-age children. The CAT-R and SEA Scale are additional tools designed specifically for this age group. As mentioned, procedures for recording and analyzing speech samples are similar to those used with adults. Some children, however, are less verbal or cannot read well enough, requiring more flexibility in obtaining sufficient speech samples, using passages appropriate to the child's ability level. Finding topics of special interest to the child can be particularly important to enhancing the client's motivation and receptivity.

Assessment Objectives

Based on the previous discussion points, a set of evaluation objectives could be proposed for the adult/adolescent/school-age child fluency assessment. Specifically those aims are to:

1. Establish rapport with the client.
2. Obtain background and case history information.
3. Describe the client's speech characteristics.
4. Understand the client's home, social, and work environment.
5. Identify conditions and variables affecting the client's speech.
6. Understand the impact of the communication disorder on the individual's life.
7. Provide information about the nature of fluency/stuttering and its treatment.
8. Recommend a plan of action for the client.

Background and Case History

The purpose of the case history portion of a clinical evaluation is to provide an organized record of all the relevant information concerning the client's condition, problem, or disorder that might be useful in its treatment and related counseling. This may encompass a detailed account of factors ranging from the initial onset and development, to the current status of the stuttering. In the case of children, the history includes such details as the home environment and family background (e.g., genetic factors, family dynamics, and attitudes), parental and/or caregiver legal rights over the client, and whether stuttering varies predictably in any conditions (e.g., emotional responses, certain settings/people, time of day). Also very important information is the nature and effects of present or past treatment. Although not all of the data collected may eventually prove useful, the case history provides clinicians with an overall picture of the problem at hand, sometimes with critical information as to what direction to pursue in treatment or which ones to avoid.

The initial contact with the client and the circumstances surrounding the referral for services are important foundations for the entire assessment and remediation process. During the first moments of interaction with the client, the clinician begins to establish the rapport and trust that will open the lines of communication between them. In Chapter 8 we elaborated on the clinician's qualities that underlie an ideal client-clinician relationship, so critical for successful therapeutic processes. For now, let it just be said that clinicians need to express genuine interest in their clients as people, and have the strength of courage and understanding to journey along with their client on the ups and downs of their path to improved speech.

The circumstances of referral could make a major difference in the trajectory of the treatment process. If a client is self-referred, has individually reached a point of courage and resolve to enter into the treatment process, then foundations for change have already been established. In contrast, if an employer, professor, or family member has urged the client to seek help, and the client is undertaking the therapy mainly to please others, then the process could be already jeopardized. In the latter case, the clinician will need to devote time to educating both the client and those who referred him or her about the nature of treatment, and the critical matter of the client's independent motivation and readiness to undertake the arduous process of change.

Table 9.1 lists a set of potential case history questions to be included during the initial interview with the client. The question "What do you do when you stutter?" is particularly important because it begins the process of examining the stuttering as a behavior on the part of the client. It also reveals the client's understanding of stuttering and whether there is readiness to discuss it in terms of his or her own initiated speech movements and consequent emotional reactions, or just how much it is ascribed to a mysterious extraneous force or impulse that arises out of nowhere, over which the client has no control (Williams, 1957). Later on, in therapy, the clinician will strive to have the client develop a point of view of stuttering in which his or her own doing is a big part of the disorder. Finally, even if the client is able to discuss stuttering in terms of self-initiated behaviors, there can be a certain amount of mismatch between the characterization of stuttering events and reactions described by the

Table 9.1: Continued

For interviewing parents:

a. Does stuttering affect how [child name] does in school?
b. Does [child name] stutter the same at school and at home?
c. Aside from speech, does [child name] struggle with any other areas (for example, in school or with developing other skills)?
d. Is a typical day for [child name] fairly calm or busy? How/Why?
e. Are there frequent big family gatherings?
f. Does he or she play with neighborhood children? Do they get along? Has teasing been an issue? How has it been handled?
g. Does [child name] prefer to play alone? or with others? Has stuttering appeared to affect play or socializing?
h. Does stuttering affect your family or you in any way(s) we haven't mentioned?
i. How important do you think speech is to [child name]?

Another important question centers on the client's attitudes and expectations. Is the client expecting that the clinician will impart a treatment, for example, sets of prescribed exercises, a powerful electrical stimulation, hypnosis, or all sorts of other treatments that should do the job of removing the stuttering? Or does the client understand that she or he will have to work diligently toward a process of multiple changes, keep practicing new speaking behaviors, altered emotional reactions and social interaction, and move out of his or her comfort zones to accomplish the various therapy objectives? If the client expects the former, then the clinician will need to devote time to educate the client about the nature of speech therapy for stuttering, the essential approach, and the work to be done to accomplish change. That is, therapy is not about "fixing" stuttering for the client but is aimed to provide the client with skills and abilities that will have to be practiced to deal effectively with stuttering and improve communication. Clients ought to realize that stuttering therapy often requires doing the very things that they least like to do, for example, speak on the telephone, talk to strangers, make oral presentations to groups, and so on.

Each individual will have his or her own painful memories and strong emotions related to stuttering that may need to be released. The clinician is to be ready to listen closely to the expressed feelings, appreciate the client's perspective, and offer the reassurance that it is safe to expose those feelings and experiences, just as they are, in the clinician's presence. The clinician's acceptance of the client's feelings and experiences, just as they are, is apt to go far in promoting progress. Because the client may need to enhance skills of self-comfort in the wake of emotional distress, the clinician can note and validate such skills of self-understanding as the client may already evidence.

Observations and Examinations: Speech

Speech Sample Context

In as much as disfluent speech is the cardinal feature of stuttering, it is only logical to expect that analyses of speech samples would typically play a central role in the assessment of the disorder. They are the means by which fluency, disfluency, and associated factors are observed and quantified for the sake of diagnosis and treatment decisions. Due to the variability of stuttering across situations, at least two, ideally three, separate speech sample contexts are recommended for an in-depth evaluation (Costello & Ingham, 1984; Gregory, 2003). With adolescents and adults, those usually consist of a spontaneous speech sample, such as conversation or monologue, oral reading, and another speaking context with individual relevance (e.g., classroom, group discussion, phone call, etc.).

A conversation and monologue are different in that there is frequent turn-taking during conversation. In contrast, a relatively continuous stream of speech is delivered during a monologue. If the clinician speaks as little as possible to encourage a monologue, the collection of a large sample can be accomplished more quickly than if there is an exchange of conversational speaking turns. Hence a monologue is a more efficient means to reach the goal of quickly obtaining a large speech sample for type/frequency analysis of disfluencies. A monologue, however, is not the most common form of daily speaking context; if a primarily valid and representative sample of speech is desired, conversation may be a better choice. Conversation, with its many shifting topics and potential interruptions, may also exert more pressure on the client, thus providing more examples of stuttering events.

To elicit a spontaneous monologue, the examiner prompts with requests such as "Tell me about your hobbies/interests," or "Tell me about the work you do." A standard monologue elicitation procedure known as the *Job Task* (Johnson, 1961a) is conducted by asking the client to talk for 3 minutes about a current job or vocation, future jobs or those held in the past, or current school classes and other activities to prepare for employment. In addition to describing the vocation, the client should say why she or he chose the job, as well as anything else about it that she or he would like to discuss. The client is given a minute or so to prepare before starting. If the client stops talking too soon, the clinician prompts with additional questions to elicit more talking. For a monologue sample, the clinician should note whether any adaptation occurs with continued talking, that is, some speakers tend to become more fluent as they keep talking. Such adaptation may suggest a milder or more readily modified form of stuttering.

Sometimes, for efficiency, a clinician might choose to record the initial interview as a form of conversational speech sample. If this context is selected, consider-ations should be given to whether the sample is representative of daily conversations. The topics discussed in the initial interview could elicit either more mild or more severe forms of stuttering than are typically encountered. Therefore, depending on the particular objectives of the fluency assessment, the clinician might want to select the speech sample context with consideration of the balance of

priorities between efficiency and representative validity. It is important to obtain information about the client's level of education and reading ability prior to selection of the reading passage. This will prevent the uncomfortable experience of asking a client to read material that is either way beyond or way below his or her abilities. Perhaps the most important factor in deciding the sample context is whether the clinician will compare the client's disfluency in terms of type and frequency or any other measure of stuttering, only to other speech samples generated by the client (relational assessment), or to published reference data (normative assessment). If the latter is the goal, a valid comparison depends on selection of a sample context that reasonably matches the one/s used to generate the normative data set.

Speech Sample Size

How long should a speech sample be to obtain valid and reliable data for analysis? Unfortunately, this is not an easy question to answer because, so far, only two studies have compared disfluency data obtained from different sample sizes: one with adults who stutter and one with adults who do not stutter. Both reported nonsignificant differences for the number of disfluencies more typical of stuttering among speech samples ranging from 300 to 1800 syllables (Logan & Haj Tas, 2007; Roberts, Meltzer, & Wilding, 2009). Some sources suggest a modest 200 syllables for each situation or speaking mode: conversation and oral reading (Riley, 1994), or 300 to 400 words (Shapiro, 1999). Others recommended an amount of speaking time, such as 3 minutes (Johnson, Darley, & Spriesterbach, 1963; Ward, 2006). And several sources addressing evaluation do not specify speech sample size (Manning, 2001; Wingate, 1976). Initial information directly relevant to the effect of speech sample size was provided by Sawyer and Yairi (2006) based on samples of speech from preschool children. They reported that longer samples, upward of 1200 syllables, were necessary to capture all the relevant disfluent speech behaviors. It is unjustified at the present, however, to generalize this finding to adolescents and adults.

One of us (CS) requires at least 300 words or syllables for the adult spontaneous speech sample, conversation, or monologue. She reasons that if the measure will be per 100 units, then 300 represents three times the sampling unit basis. When evaluating baseline measures, at least three data points are required to establish a trend (Barlow, Hayes, & Nelson, 1984). In contrast, a minimum standard of 600 syllables was advocated by Yairi and Ambrose (2005). They argue that the larger sample size is necessary to sample certain disfluency types adequately, for example, disrhythmic phonations or repetitions of four or more units (e.g., Bu-bu-bu-bu-but), which generally occur at a much lower frequency, especially in mild to moderate stuttering, than other disfluencies but yet are very important contributors to the overall impression of stuttering and its severity. They opined that "it is advisable to have at least three tokens for any given type of disfluency. Just one could be random, two are insufficient to identify a pattern or obtain a mean, but three indicate that the behavior is more than a fluke, presenting some semblance of pattern or typicality" (p. 106). Again, although their comments were made in regard to young children, it may be even more critical for older children who may have found ways to suppress their stuttering-like disfluencies and be at risk for underdetection of their speech problem.

As explained, the issue of sample size is important for the purpose of counting the frequency of specific disfluency types. This, however, is not the case if the clinician is interested only in assigning an overall rating of stuttering severity. When stuttering appears to be severe, a short sample can suffice. The milder the stuttering, the longer the sample size necessary to rate severity with confidence.

For the oral reading context, longer samples are usually not necessary to find out whether this condition differs from spontaneous speech samples. Although the per 100 unit basis will be applied in measurements, a paragraph of oral reading is often enough to reveal the severity of stuttering in that context. If the examiner is looking for adaptation or wants to establish a baseline frequency measure, then a passage of at least 200 syllables would offer more representative data. Also, time may be the more appropriate standard of sample size length. If a client displays considerable struggle, with blocks lasting many seconds long, then measuring the number of fluent words or syllables spoken in 3 minutes is apt to be more meaningful than the number of disfluencies or stutter events per 100 words.

Measures of Stuttering or Disfluency

A variety of systems of analysis have been employed to measure and report the amount of stuttering in speech samples. Although they appear similar, important differences exist among systems. For example, the frequency of stuttering per 100 words is quite different from the percentage of stuttered words. Both measures are based on the clinician's subjective perception that some instances of stuttering occurred. The first measure, however, provides more accurate information in that it allows for counting more than one stuttering event on the same word (e.g., A-a-ari-zo-zo-zo-na has two events). The second measure allows for counting only one stuttered word. In this case, the first method reports twice as much stuttering for the same amount of speech. These measures of perceived stuttering events, however, do not provide information about the kind of stuttering that took place. They only reveal the total number of the events. A third measure, the objectively counted frequency of various disfluency types per 100 syllables or words, yields much more information on the specific characteristics of the client's speech. It not only reveals how many interruptions are contained in the speech, but it provides specific descriptions of them, discriminating among repetitions, sound prolongations, interjections, and other types or forms. This is meaningful information to have.

In 1988, Kully and Boberg sent an identical set of speech samples to multiple clinical sites to be analyzed for stuttering frequency, and they discovered that the approaches and event counts differed substantially across sites. Although their specific procedures and findings have been seriously questioned (Ryan, 1997; Yairi, 1997[1]), such disagreement can be understood given the fact that there are many ways

[1] Yairi (1997, p. 54) stated that "Although Kully and Boberg (1988) emphasized the disagreement among clinics in identifying stuttering and disfluencies, an inspection of their Table 2 reveals that the average agreement between the two clinics which counted 'percent disfluency' was 81.7%, a respectable level that was considerable better than agreement among clinics which counted 'percent stuttering.'"

in which stuttering has been quantified. The major differences among metrics of stuttering come from two parameters. First is the target's of interest, that is, what is being measured. Second is the sampling units or period over which measurements are made. The target may be any of the following: (1) perceived stuttering events (also referred to as "moments," or "instances," of stuttering), (2) descriptive disfluency types, or (3) perceptually fluent speech. The sampling units can consist of syllables, words, or time intervals (see discussions by Yairi, 1997, and Yairi & Ambrose, 2005).

Another train car analogy (see Chapter 6) may help illustrate the different ways speech samples may be analyzed. The general question is: How much cargo is there? One way to find an answer is to look in each train car for whether it contains boxes of cargo, count the cars with cargo in them, and divide by the total number of train cars to arrive at the percentage of train cars with cargo. This method is like measuring % of cargo in the entire train, then divide by the total number of train cars. This calculation yields the number of cargo boxes per train car. By multiplying that number by 100, the number (frequency) of cargo boxes per 100 train cars is estimated. This latter method is like measuring the frequency of stuttering (or disfluencies) per 100 syllables (or words). The information yielded by the two ways of obtaining measures is different.

Depending on the combinations of target (e.g., disfluencies, stutter events) and sampling units (e.g., syllables, words, time intervals), different measurement methods may be applied. In one method, all disfluent instances are counted and their frequency relative to the overall number of sampling units is calculated. This method results in the frequency of disfluencies per 100 syllables or words. In contrast, each sampling unit (e.g., each syllable) can be examined for whether the target feature (e.g., stuttering) is present. For example, among the 274 syllables sampled, how many are perceived as stuttered? This method yields the measure of percentage syllables stuttered. If preferred, each word, rather than each syllable, is analyzed. Table 9.2 shows the formulas for several types of speech behavior analyses.

Table 9.2: The Target Behaviors, Sampling Units, and Formulas for the Various Measures of Stuttering from Speech Sample

Type of Measure	Target Feature	Sampling Unit	Formula
Disfluency frequency per 100 syllables or words	Descriptive disfluencies according to type	Syllables or words	$\dfrac{\text{No. disfluencies} \times 100}{\text{No. syllables or No. words}}$
Percentage of words stuttered	Perceived stuttering	Words	$\dfrac{\text{No. stuttered words} \times 100}{\text{No. words}}$
Fluency frequency index	Perceived fluency	Words	$\dfrac{\text{No. fluent words} \times 100}{\text{No. words}}$
Frequency of stuttered intervals	Perceived stuttering	5-s intervals (or shorter) of speech	$\dfrac{\text{No. stuttered intervals} \times 100}{\text{No. intervals}}$

To derive the first measure in the table, the number of disfluencies in the entire sample is divided by the number of syllables in the sample. The outcome is then multiplied by 100. Alternatively, multiply the number of disfluencies in the sample by 100 and then divide by the number of syllables. A clinician who specializes in stuttering will want to shift flexibly among these methods, depending on the assessment needs. If a clinician wants to obtain a severity rating using the Stuttering Severity Instrument (SSI-4) by Riley (2009), then the percentage of syllables stuttered metric would be applied. If, however, there is an interest to obtain an analysis of the specific types of disfluent characteristics displayed by the client, then a calculation of disfluencies per 100 words (or syllables) could be used. Both of these methods of analysis are based on the clinician's review of previously recorded audiovisual speech samples and are referred to as *offline* analysis. Alternatively, if during a clinical session, a reliable *online*[2] method of stuttering data collection is desired, judgments of whether 5-s time intervals in the sample contain stuttering might be helpful (Cordes & Ingham, 1994, 1999). Another measure that may be useful to assess progress in stuttering treatment is the fluency frequency index (FFI), based on the number of fluent words per total words (Shapiro, 1999). Of course, this is not a direct measure of the stuttering per se. It provides information about the amount of speech not affected by the stuttering disorder and may help focus the client's attention on fluent rather than disfluent speech. In sum, there is no universally adopted system of speech sample analysis for purposes of evaluation of stuttering and fluency. Clinicians may opt to employ a single method with which they feel comfortable or train themselves in several methods that they are capable of using as the need arises.

Several additional methods have been proposed for measuring fluent, also called *stutter-free*, periods of speech. Costello and Ingham (1984) offered the following two measures, among several more: the average *duration* of the three longest nonstuttered intervals measured in seconds and/or minutes, and the average *length* of the three longest nonstuttered intervals measured in numbers of syllables. An alternative to measuring fluent time periods is the measurement of disfluent time. Starkweather, Gottwald, and Halfond (1990) suggested the percent time disfluent (PTD) measure. PTD is derived by summing up the duration of all disfluencies in a sample, then calculating its percentage of the total duration of the sample. In a later publication, Starkweather and Givens-Ackerman (1997) referred to this same measure as the percentage of discontinuous speech time (PDST). Sometimes measures like these, or disfluent or fluent time periods, are particularly useful for showing progress with treatment.

Speech Recordings and Transcription

Audiovisually recorded samples are more desirable than audio samples alone because visual information is there to aid the interpretation of an event. For example, a silent pause may represent a type of disfluency, such as a static oral posture, or it could simply be a moment when the client stopped talking to think about at something. An audio recorded sample, however, may be a useful backup if the video technology fails.

² Note that the term *online* here is synonymous with "live" and must not be confused with the common but entirely different meaning for the term *online* of being connected to the Internet.

The audio recording system should be checked in advance for sound clarity and unwanted noise. The gain control switch should be turned off in recorders that have this feature to avoid variations in loudness and loss of some speech, especially at the beginning of utterances. Another decision regarding *video* recordings has to do with what view of the client to frame (e.g., full face, full body, upper body, etc.). Because it is of interest to capture potential secondary behaviors that can involve arm movements as well as upper body posturing, it is desirable to obtain a video image that includes the upper body from the waist to the head, at a distance close enough to reveal oral postures and facial expressions.

Once a speech sample is recorded, the next step is making a written transcription of it to facilitate detailed analyses. For this task, it is usually best to start by transcribing only the client's words in an utterance without noting the disfluencies. The next step, analysis, is made easier when each spoken utterance is distinguished in the transcript by starting it on the next line. Knowledge of the context of the words beforehand aids in resolving challenging questions, such as whether an utterance was a word "a" or an interjection "uh." In our practice, we review (listen to) the recorded speech sample as many times as necessary to ensure the most valid and reliable transcript as the basis for the analysis.

Procedures for Speech Sample Analysis

After all the words in the speech sample have been determined, the examiner can then listen again to the utterances, marking the location of the specific target according to the clinician's preferred measure or the particular need. It is also helpful to add in the transcript any comments or behavioral observations that could aid interpretation later (e.g., "started to speak before examiner finished" or "coughed and scratched his head"). Notes about secondary behaviors (e.g., "looks away," "gasped," "head jerk," "lip tension," etc.) are also useful to include where applicable in the transcript. Braces can be used to set these apart from the spoken words.

If *percentage of stuttered words* is the desired measure, each word perceived with confidence as stuttered is marked. As explained earlier, the stuttered words are then counted and their percentage in the total number of words in the speech sample is calculated. In a 369-word sample containing 23 stuttered words, the percentage of words stuttered is 23/369 × 100 = 6.23%.

If *percentage of stuttered syllables*[3] is the desired measure, the procedure is very similar. Each syllable perceived as stuttered is marked, the total number of syllables in the sample is counted, and the percentage of stuttered syllables is calculated. In a speech sample of 443 syllables containing 65 stuttered syllables, the familiar math involved is as follows: 65/443 × 100 = 14.67%.

When specific disfluency analysis is desired, the clinician indicates on the transcript each of several disfluency types (e.g., syllable repetition, interjection, sound

[3] In published literature, the terms "percent syllables stuttered," "percent stuttered syllables," and "percentage of syllables stuttered" are all synonymous, as are the parallel terms where "words" is used in place of "syllables."

prolongation), using a simple marking code. This can be aided by applying a different-colored highlighter for each type of disfluency where it occurs.

After the transcript is completely marked, the occurrence of each type in the sample is counted and its frequency per 100 syllables is calculated and tabulated. Then, the total frequency per 100 syllable of *all* types combined is derived. The clinician may also wish to derive subtotals of these disfluency types grouped as Stuttering-Like Disfluency (SLD) and Other Disfluency (OD), or other desired categories. A display of this type of analysis in a 566-word speech sample, in which a total of 147 disfluencies (25.97 per 100 words) were identified, is illustrated here:

Disfluency Type	Per 100 words
Part-word repetitions (45)	7.95
Whole-word repetitions (19)	3.36
Disrhythmic phonation (33)	5.83
SLD Subtotal (97)	**17.14**
Phrase repetitions (12)	2.12
Interjections (34)	6.01
Revisions (4)	0.71
OD Subtotal (50)	**8.83**
Disfluency Total (147)	**25.97**

Selection of Sampling Units

Prior to the analysis, the examiner must decide what sampling unit to apply, usually words or syllables. Several considerations will be needed. First, if comparisons will be made to published data sets, then the same constituents, words or syllables, must be applied in the analysis. If a direct match is not possible, adult sample estimates may be made by converting the word count to a syllable count (or vice versa), applying a 1.5:1 syllables-to-words ratio. By contrast, samples from young children, typically users of more monosyllabic words in their speech, would be converted with a smaller ratio of approximately 1.15:1 (Yaruss, 2000).

The following example illustrates the conversion of a syllable metric to a word metric. Suppose a 600-syllable speech sample was collected with 60 disfluencies. The frequency of disfluency is 10 per 100 syllables. If the clinician wants to compare this value to the norm, which is about 7 disfluencies per 100 words for adult spontaneous speech, then a conversion is needed. By applying the ratio of 1.5 syllables per word, the number of words is estimated by dividing 600 syllables by 1.5, yielding 400 words. The disfluency frequency can then be recalculated based on 60 disfluencies per 400 words, which would be 15 per 100 words. The result turns out to be considerably higher than the normative standard.

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), time 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; Guitar, 2006; Retherford, 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 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., "bana-" 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 Yairi 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. Speech sample sizes ranged from 300 to 363 words. Note that, except for the category of interjection, the two studies provide reasonably similar data for the young adults. 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 she or he 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.

Appendixes 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,

word repetitions, and disrhythmic phonations statistically, the investigators concluded that women do not tend to have more severe stuttering than men.

There are surprisingly few disfluency type/frequency data reports for school-age children. Overall disfluency and within-word disfluency (similar to SLD) for 14 children (11 boys; 3 girls) who stutter, ages 5.5 to 11.5 years, based on 300-word conversation samples, were reported by Zebrowski (1994). Overall frequency of disfluency per 100 words ranged from 10 to 49 with a median of 16. Within-word (core) disfluency ranged from 4 to 36 with a median of 12 per 100 words.

Silverman (1974) published disfluency data according to frequency/type distribution for 56 school-age children who stutter and 56 normally fluent controls. Comparing oral reading and a story narrative, he concluded that the latter material provided better differentiation of the two groups. As reported by Silverman, the data presented in Appendix 9.6 are in the form of quartiles. The Appendix displays figures for only the first three quartiles (Q1 = lowest 25% of subjects; Q2 = the second 25% of subjects; Q3 = the third 25% of subjects). We suggest that the 50% (Q2) figures may be applied clinically for a diagnostic reference (comparing the child's data to the stuttering group) or for establishing a therapy target for a child who stutters (reaching the nonstuttering group).[4]

Overall, the important observation to make from the various sources is the large differences between those who stutter and those who do not stutter in the critical subset of disfluencies referred to as within-word, core, or SLD. These are the most characteristic of stuttered speech and also tend to be perceived by listeners as stuttering. Note that the total mean for this subset of disfluencies for the normally fluent speakers in oral reading is less than 1. It is about 10 for those who stutter. Typically, at least three SLDs or core disfluencies is seen as the minimum required to classify speech as stuttering.

Stuttering Severity

In its most frequent usage, the term *stuttering severity* refers to the level of disruption in the delivery of continuous speech. There is a high correlation between the objective quantity of stuttered speech and listeners' ratings of stuttering severity (Young, 1961). The number of times speech is disrupted, the specific characteristics of the disfluent speech, and the duration/length of the disruptions usually affect judgments of how much breakdown has occurred.

Overt stuttering severity, however, is independent of the impact of the total stuttering disorder. The independence mentioned earlier is seen in the case of a speaker who stutters rather severely yet has a mild disorder. That is, some speakers do plenty of stuttering but have minimal emotional reactions, and they have no disabilities or difficulties in social or vocational realms. Other speakers stutter mildly but experience

a deep or intense disorder. The occasional overt instances of stuttering cause enough emotional distress to result in serious social or vocational debilitation. Although the impact of the disorder is ultimately important, this discussion is meant to highlight the point that the term *stuttering severity* is reserved for a description of the overt speech aspects rather than the disorder as a whole.

Clinicians may estimate the severity of stuttering in several ways. The simplest, devoid of any actual measurement or counting, is based on observing the client speak or read and then assigning a global rating on a subjective perceptual scale of stuttering severity. Clinicians seem to favor a 3-point scale with the most popular ratings being *mild, moderate,* and *severe.* Yairi and Ambrose (2005) used an 8-point perceptual scale, ranging from normal fluency (rated 0) to most severe stuttering (rated 7). They reported that some experience should yield high agreement with other clinicians. Clinicians, however, have been provided with several more analytical methods that take into account several factors in the assignment of a severity rating. For diagnostic purposes, Wingate (1976) recommended a 5-point scale (very mild, mild, moderate, severe, and very severe) that considers the frequency of stuttered events, the effort involved, and the presence of concomitant behaviors. This short instrument, the Severity Rating Guide, is presented in Table 9.3 for illustration purposes.

Two of the more well-known stuttering severity scales are the *Iowa Scale of Severity of Stuttering* (Sherman, 1952), and the more recent *Stuttering Severity Instrument,* also known as the SSI-4, by Riley (1994, 2009). Both are based on three components: frequency of stuttering events, their duration, and the intensity of

Table 9.3: Severity Rating Guide

| | | Descriptive Assessment | |
Overall Rating	Frequency (per words spoken)	Effort	Accessory Features
Very mild	1/100 (1%)	No perceptible tension	None
Mild	1/50 (2%)	Perceptible tension but "block" easily overcome	Minimal tstaring, eye blinks or eye movement or slight movement of the facial musculature)
Moderate	1/15 (7%)	Clear indication of tension or effort; lasts about 2 s	Noticeable movement of facial musculature
Severe	1/7 (15%)	Definite tension or effort; lasts about 2-4 s; frequent repeat attempts	Obvious muscular activity, facial or other
Very severe	1/4 (25%)	Considerable effort; lasts 5 s or more; consistent repeat attempts	Vigorous muscular activity, facial or other

[4] It should be noted that Silverman's data were based only on male school-age children, second through sixth grade. As discussed in Chapter 1.3, preschool data yielded no significant differences between genders (Ambrose & Yairi, 1999). Some adolescent data revealed no significant differences between genders (De Oliveira Martins & Furquim de Andrade, 2008). Furquim de Andrade & De Oliveira Martins, 2007). We therefore suggest that the Silverman data are apt to be relatively applicable with either gender for children in elementary school.

Rate Measurement Procedures

The procedures for measuring speaking rates begin with recording a speech sample, transcribing the words, and counting words/syllables as described earlier in this chapter. For most clinical purposes, the time taken for the speech sample, or segments of interest, may be measured in minutes and seconds using a stopwatch. If measures will be compared with published data, the clinician must ensure that methods and standards of measurement match what was applied. For *overall speech rate*, the time from beginning to end of the sample is clocked. The clock should not keep running when the conversational partner talks or during periods of 2 s or more of silence while thinking about what to say or while yawning, coughing, sneezing, or similar. To ensure accuracy, it is worthwhile re-clocking the sample twice, or even three times, find the mean, then calculate the rate by dividing the number of words or syllables spoken by the amount of time. The examiner must remember to calculate seconds using a 60-base, not decimal-base system. As stated in Chapter 4, Fairbanks (1960) reported that a satisfactory range of oral reading rate by more than 200 college students for a 300-word passage was 150 to 180 words per minute (wpm). A later study by Walker (1988) reported the mean oral reading rate for 120 young adults was 188.4 wpm (SD = 19.7), and it was 172.6 wpm (SD = 33.4) for conversational speech.

For *articulatory rate* measures, because the human ear is capable of detecting short silent intervals (e.g., 65 ms), even the slightest perceived break should disqualify an utterance from analysis (Prins & Hubbard, 1990, p. 495). Also disqualified should be the utterances bounded by any disfluency either just before it begins or after it ends. When articulatory rates are measured, the clinician should select from the speech sample three perceptually fluent, uninterrupted utterances. An example of the calculation is presented in Table 9.4.

The clinician should bear in mind that articulatory rate measures are especially sensitive to factors such as utterance length, word lengths, and location within utterance. Longer stretches of continuous speech (e.g., 15 syllables) are apt to yield faster rates than shorter utterances (e.g., 5 syllables). Beginnings of utterances tend to be spoken more quickly than endings of utterances (Lehiste, 1972). Articulatory rates from spontaneous monologue contexts for nonstuttering adults for utterances of 7 to 8 words (8 syllables) typically range from 4 to 8 syl/s (unpublished research by CS; also consistent with converted data from Tsao & Weismer, 1997). There is some evidence to suggest articulatory rates in oral reading may tend to be on the slower end (approximately 4.35 syl/s) of this range (Logan, Roberts, Pretto, & Morey, 2002). In contrast, other reports of oral reading speech rates tend to be faster than spontaneous speech rates, probably because pauses are shorter and less frequent in oral reading.

If a client's speech rate is perceived to be faster or slower than expected, the clinician must consider what is leading to that impression. Naturally, when a speaker is disfluent, speech takes additional time and seems slower. Without disfluency, however, the perception of speech as fast or slow results largely from the placement and timing of pauses (Goldman-Eisler, 1961). The clinician would do well to also examine

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Table 9.4: An Example of Measuring Articulatory Rate

1. Count the number of spoken syllables in each utterance

   Utterance A: "Can you find the answer for me" — 8 syllables
   Utterance B: "Was on the old table over there" — 9 syllables
   Utterance C: "Remembered to go the grocery store" — 9 syllables
   (expected word "to" before "the" was not uttered, grocery said as "gros-ry")

2. Measure the duration of each entire utterance 3 times and find the average duration for each of the utterances. For example

Utterance A	Utterance B	Utterance C
1.60	1.72	1.67
1.58	1.75	1.65
1.57	1.72	1.68
Averages: 4.75 / 3 = 1.58	5.19 / 3 = 1.73	5.00 / 3 = 1.67

3. Find the *articulatory rate* for each utterance by dividing the number of syllables by the time. Next, average the values from each utterance to arrive at the overall rate measure. For example

	Artic Rate
Utterance A: 8 syllables / 1.58 s =	5.06 syl/s
Utterance B: 9 syllables / 1.73 s =	5.20 syl/s
Utterance C: 9 syllables / 1.67 s =	5.38 syl/s
Overall Rate:	15.64 / 3 = **5.21**

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which types of utterances are apparently faster or slower. Overlearned and previously prepared automatic sequences of spontaneous speech can be delivered at much faster rates than unrehearsed statements, especially those composed of new thoughts, unfamiliar words, or novel phrases (Goldman-Eisler, 1961; Levelt, 1989).

Voice and Other Communication Skills

Speech samples afford an opportunity for the clinician to screen other domains of communication besides fluency: articulation, language (syntax, semantics, pragmatics), and voice. The domain of voice requires particular attention in the evaluation of stuttering but is too often neglected or minimized because of the great concentration on the client's disfluency. The examination of voice (and other domains) can be made during the interview and later listening to the recorded speech. The clinician should remember to make note of such domains both in fluent and disfluent speech. Is the voice quality normal and relaxed, or is it tight or harsh? Are there notable changes during stuttering (e.g., vocal fry, sharp upward pitch breaks)? This is also the time to observe intonational variations: inflections and prosodic contours. A reduced range of these variations, in addition to the stuttering, may significantly affect the speaker's communicative effectiveness and the overall listener's impression of the disorder. This type of information is useful in planning goals for therapy.

Another aspect of evaluation not to be overlooked is the clinician's detection and appraisal of the client's communication strengths. Perhaps the client does well

with nonverbal behaviors such as eye contact, facial expression, body postures and gesturing, or similar. Voice and intonational patterns may be particularly pleasant, stuttering aside. The client may do well with appropriate pragmatic uses of language compared to most speakers, have a strong vocabulary, pronunciation mastery, or display above-average command of grammatical constructions. The clinician should make a point to look for the client's strengths, being sure to discuss them in postassessment counseling. An awareness of these areas is important to enhance the client's self-understanding of his or her overall effectiveness as a communicator. Self-perceptions can often be distorted by a speaker's emotional frustration with stuttering.

Speech naturalness and speech quality have been common concerns about the outcome of stuttering treatment programs (Martin, Haroldson, & Triden, 1984; Onslow & Ingham, 1987). Speech naturalness is usually measured on either a 9-point or 7-point scale, where 1 represents highly natural-sounding speech, and 9 (or 7), highly unnatural-sounding speech. These ratings may be made by listeners such as the clinician or peers, or by the speaker in the form of self-ratings of naturalness. R. Ingham, I. Ingham, Onslow, and Finn (1989) demonstrated that adult clients can both rate and modify their speech based on the application of such scales. A later study revealed that speech quality could also be assessed through self-ratings of speech effort on a 9-point scale, where 9 is most effortful and 1 is least effortful (Ingham, Warner, Byrd, & Cotton, 2006).

Observations and Examinations: Other Domains

Having obtained speech samples for the multiple analyses just described, the focus of the initial evaluation shifts to other domains of the complex stuttering, those involving affective reactions. As discussed in Chapter 4, affective reactions become increasingly important with more years of experience with stuttering. Fear and discomfort may develop for specific types of social settings or in relation to speaking and stuttering. Following we present two classes of protocols, those related to (1) speaking situations and (2) more general attitudes and reactions to stuttering.

Situational Rating Protocols

The variability of stuttering across individuals and contexts is the main reason why clinicians seek information regarding the client's difficulties in different speaking contexts. This information is first gained during the case history interview but can be greatly enhanced through the administration of one or more available protocols. These include the *Stutterer's Self-Ratings of Reactions to Speech Situations* (SSR; Darley & Spriestersbach, 1978), the *Southern Illinois University Speech Situation Checklist* (Hanson, Gronhovd, & Rice, 1981), and the *Reactions to Selected Speaking Situations* (Prins, 1993, p. 138). These protocols are similar in that they use lists of situations, such as talking on the phone, introducing oneself, and so on, to which the client is to respond. What differs among them are the ways in which the client is to evaluate each situation.

In the *Stutterer's Self-Ratings of Reactions to Speech Situations*, 40 situations are each rated by the client on a 5-point scale corresponding to various descriptive statements for the following dimensions: (1) frequency—how frequently the situation is met, (2) stuttering—how much stuttering occurs in it, (3) avoidance—how much the client tries to avoid the situation, and (4) reaction—how much the client likes/dislikes speaking in the situation. An advantage to this scale is that a good amount of important information is obtained from the client. Also available are reference data (Darley & Spriestersbach, 1978, p. 314) for the scores in each of the four areas. A disadvantage is that some terms and expressions used in the situation list have become antiquated. For example, the descriptions refer to "parlor games," "a bull session," and "taking leave of a hostess."

The original version of the *Southern Illinois University Speech Situation Checklist* assessed 51 situation items. Its much shorter version is composed of only 21 items. In either version, situations are rated on a 5-point scale in only one dimension: how much it disturbs the client to speak in it. Clearly, the shortened version with fewer situations and only one area to rate offers greater efficiency. Another advantage is the research support for the item selection process for the shortened version. There are, however, no reference data against which scores can be compared, and a few items are worded in antiquated language. For example, there is a reference to "talking when high." In the past, it meant being very excited but because these words later became associated with intoxication from drugs, clients may find the item offensive or confusing.

The original version of the *Reactions to Selected Speaking Situations* includes 25 situational items, each of which is evaluated on a 5-point scale for three dimensions: (1) frequency (how frequently the situation is met), (2) level of difficulty (how much trouble speaking in it), and (3) level of confidence (how confident the client is in the situation). A modified instrument with 24 items is presented in Table 9.5. Like the previous protocol, the small number of items makes for a more efficient use of time. In addition, none of the situation descriptions is worded in a way that is antiquated or ambiguous. A possible disadvantage is that clients might find it harder to evaluate levels of confidence than levels of disturbance, avoidance, or like/dislike of a situation. There also are no reference data for the scores obtained, but this should not necessarily detract from its clinical value. These protocols simply add more organized, more detailed information to that obtained in the interview. They also best serve for comparing a client's baseline ratings (pretreatment) with later progress (posttreatment) and not primarily as a differential diagnostic tool to distinguish the stuttering disorder.

Another meaningful way to engage in evaluating the client's concern about various speaking situations is the devising of an individualized situation hierarchy. Its advantage is that the client only has to deal with the situations that are meaningful to him or her, with immediate implications to own treatment. The client is first asked to list and describe as many situations as are meaningfully relevant to his or her life. The list should not be lengthy, and the clinician can offer suggestions of types of situations or permit the client to look at a list from a protocol for suggestions. After the nations or permit the client to look at a list from a protocol for suggestions. After the list is constructed, the client ranks the situations in order from least to most difficult.

Table 9.5: **Reactions to Selected Speaking Situations**

Situation	Frequency†	Level of Difficulty†	Level of Self-Confidence†
1. Talking on the phone to family or friends.			
2. Talking on the phone to a stranger			
3. Using the phone to purchase a ticket			
4. Talking to a stranger in a social situation			
5. Introducing myself			
6. Placing an order in a restaurant			
7. Talking to a close friend			
8. Talking to parents			
9. Talking with a sales clerk			
10. Meeting someone for the first time			
11. Asking for information			
12. Being interviewed for a job			
13. Talking with teachers			
14. Making introductions			
15. Speaking before a group			
16. Saying a question or comment in class			
17. Going or saying in a classroom situation			
18. Giving a prepared speech			
19. Talking to someone of the opposite sex			
20. Participating in a meeting			
21. Reading aloud to others			
22. Conversation at recess with family			
23. Conversation at meals with friends			
24. Conversation in a restaurant with strangers			

Frequency
How often in the situation?
O Quite often
R Relatively often
S Sometimes
T Rarely
U Almost never

Level of Difficulty
In the situation?
O Quite self-contained
R Relatively self-contained
S Somewhat difficult
T Tough
U Impossible

Level of Self-Confidence
In the situation?
O Quite self-confident
R Relatively self-confident
S Somewhat self-confident
T Freely self-confident
U Undecided

such a list is valuable when subsequent therapy is focused on desensitization. It is advisable to check in with the client later on, and on multiple occasions as necessary, to find out whether the sense of difficulty and ranking of the situations has changed.

The previous protocols evaluating the difficulty of speaking situations might also be viewed as assessments of client attitudes about speaking situations. In that light, two additional protocols also can be used. These are the *Self-Efficacy Scale for Adult Stutterers* (SESAS; Manning, 2001; Ornstein & Manning, 1985) and the *SESAS Self-Efficacy Scaling for Adolescents Who Stutter* (Manning, 1994, 2001). The SESAS has the client rate the same 50 speaking situations on two dimensions: (1) approach attitude and (2) fluency performance. For either dimension, clients apply a 10-point scale from 10 to 100, where 10 is "quite uncertain" and 100 is "very certain." To assess approach attitudes, clients answer whether they would (1) enter the situation, and (2) how much confidence they have with their response. To assess fluency perform-ance, clients answer whether they would (1) be able to achieve fluency in that situa-tion, and (2) how much confidence they have with this response. Advantages of this protocol are that the descriptions use current terminology and the contexts are familiar, such as McDonald's, the shopping mall, or ordering a pizza. Also, rating con-fidence in a response could be easier than evaluating self-confidence, and reference data for stuttering and nonstuttering populations are available.

The SEA Scale requires adolescents to rate 100 situations on a scale from 1 to 10 to indicate confidence in the ability to enter and speak in each situation. All situational descriptions are worded with current and unambiguous statements. Responses can be evaluated with respect to 13 subscales related to telephone; arguments with familiar people; arguments with strangers; conversing with a family member; conversing with an authority figure; conversing with a familiar group; conversing with an unfamiliar group; formal presentations; making requests of a stranger; making requests of an authority fig-ure; time-pressure contexts; and memorized or unchangeable texts. Although making estimations of self-confidence can be challenging, the authors have provided clear descriptive statements to apply when using the scale. A disadvantage could be the time required for responding as well as for scoring the numerous responses.

I listed here are several possible choices of the method for assessing reactions to speaking situations. As we explained previously, the first two in this list address many situations but may use wording that confuses some clients. The next two offer rele-vant situations but still involve making a sizable number of ratings. An individualized hierarchy is quite functional but may pose the risk of overlooking some common sit-uations. When one of these tools is chosen, many other factors (e.g., time, cost, client age, etc.) must also be considered.

Tools for Assessing Speaking Situations
- *Stutterer's Self-Ratings of Reactions to Speech Situations* (SSRR; Darley & Spriestersbach, 1978)
- *Southern Illinois University Speech Situation Checklist* (Hanson, Gronhovd, & Rice, 1981)
- *Reactions to Selected Speaking Situations* (Prins, 1993, p. 138)

- *Self-Efficacy Scale for Adult Stutterers (SESAS)* and *SEA Scale: Self-Efficacy Scaling for Adolescents Who Stutter* (Manning, 2001)
- Individualized situation hierarchy

It cannot be emphasized enough that whether the assessment is of reactions to speaking situations or of attitudes about stuttering, the clinician must have established a relationship of trust with the client prior to their administration. The clinician should judge whether a client is ready to disclose this kind of information, or if it would be better to wait until the client is more comfortable trusting the clinician with it. CS has seen multiple instances where clients have filled in responses according to what they believed they *should* answer, rather than what they actually experienced. In another occasion, a client marked all 25 situations with midscale ratings of 3 on the 5-point scale rather than reveal specific troubles. Rather than admitting the limitation, clients may also provide a rating for a situation despite insufficient basis for self-evaluation after years of avoidance of speaking in it. For this reason, the SESAS would be a preferable instrument to elicit informative responses. In some cases, it may be wise for a clinician to postpone administration to a later time when sufficient rapport has been established.

Attitude Rating Scales

Attitudes are one of the most important variables related to disfluent speech, yet they are among the most challenging to assess. Part of the challenge comes from the fact that there are so many potential attitudes that may be relevant, and individuals vary considerably in the extent to which certain attitudes are of concern. Clinicians should consider attitudes about stuttering, speaking, oneself, other people, and more. Naturally, the clinician's understanding of the client's needs begins with the dialogue that takes place during the case history interview. Attitudes need to be explored in a manner that is both respectful and sensitive to the feelings that may lie close beneath the surface. It can be difficult for a client to review the impact of stuttering and their attitudes about it.

Several formal instruments have been published for the purpose of assessing attitudes related to stuttering. These include *The Modified Erickson Scale* (Andrews & Cutler, 1974), which in its original form was referred to as *The S Scale* (Erickson, 1969), the *Communication Attitude Test* (Brutten, 1985; Brutten & Dunham, 1989), and the *Overall Assessment of the Speaker's Experience of Stuttering* (Brutten, 1985; Yaruss & Quesal, 2006).

The *S Scale* consisted of 39 items, all in the form of statements to which clients must answer true/false about whether they agree with it. For example, "I find it easy to talk with almost anyone." Reference data are available to interpret the extent to which the score on the communication inventory is more similar to those who stutter or who do not. The *Modified Erickson Scale (S-24)* has only 24 items, and it also has reference data for comparing responses to those who stutter or who do not. Scoring of either scale is not straightforward. Instead of simply counting numbers of true or false answers, the numbers of expected answers are totaled. The scoring therefore requires comparison of each item's response with the expected answer, established during the construction of the instrument, as to whether it agreed (1 point) or did not

of one item with such antiquated wording that people might not know what it means (i.e., "I am a good mixer.") Also, these Erickson scales have been criticized for yielding scores that are not independent of stuttering behavior (Ulliana & Ingham, 1984). That is, ideally a communication attitude inventory would assess thoughts and feelings operating independently of stuttering, but research suggests the answers are apt to be strongly influenced by stuttering.

The *Communication Attitude Test (CAT)* should be administered with adolescents, not adults. Appropriate for school-age children, 8 of the 35 statements make reference to "other children," "other kids," or being "in class," or with "classmates." Clients must answer true/false about their agreement with each of 35 statements. A revised version, the *CAT-R* with 32 items (De Nil & Brutten, 1991; Vanryckeghem & Brutten, 1992), yields reliable results with reference data for both stuttering and nonstuttering children, ages 7 to 14.

The *Overall Assessment of the Speaker's Experience of Stuttering (OASES)* includes both aspects of attitudes assessment and situation ratings. It is designed for adults who stutter, ages 18 and older, to assess the comprehensive impact of stuttering on the person's life. Clients respond to 100 items in four sections (General Information, Reactions to Stuttering, Communication in Daily Situations, and Quality of Life) using a 5-point scale that differs in meaning across sections. In the General Information section, 20 items address a broad overview of perceptions of speaking ability, knowledge about stuttering, and feelings about speaking and stuttering. In the Reactions section, 30 items address specific stuttering-related emotions, experiences, and attitudes. In the Daily Situations section, 25 speaking situations are rated for level of difficulty. The Quality of Life section contains 25 items about how much stuttering negatively impacts or interferes with the client's life, personally, socially, and vocationally. The scores for each section on the OASES are converted to Impact Ratings interpreted on a 5-level scale, ranging from Mild to Severe. There is also a Total Impact Score that is interpreted similarly. Score interpretation is based on published research and reference data. The questions and situation descriptions in the OASES are clearly worded, and its content has current relevance. Because the instrument is meant to be comprehensive, it is also lengthier than the rest. One limitation may be that, unlike the SESAS, clients do not indicate how certain they are of their responses.

To assess the quality of the instruments, Franic and Bothe (2008) reviewed 17 attitude and situation assessment instruments for psychometric properties. Ten of the 17 were evaluated in detail with respect to 15 measurement criteria. These criteria included conceptual model, validity, reliability, responsiveness, interpretability reference data), burden (client [respondent and examiner administrative], depth, and versatility. Of the instruments discussed, only the *CAT/CAT-R* and *Modified Erickson Scale (S-24)* met at least half of the standard criteria for application as a diagnostic tool. These were criticized for their low test-retest reliability, lack of being based on clear constructs, and insufficient research on their responsiveness to clinical change. The SSR and OASES met fewer criteria. The authors expressed concern that the OASES may overidentify problems. The SSR has not received adequate testing for validity and reliability. These were the only instruments reviewed among those that we have discussed in this chapter.

Like the assessment of speaking situations, rapport must be established first to ensure the client is ready to trust the clinician with the information prompted by attitude scales. Some scales are best suited to serve as pre- and posttherapy surveys with clients who have had previous experience with therapy. Some surveys, like the OASES, are best applied in the context of an interpersonal interview and not as a self-administered questionnaire given to the client to fill out. Because such scales prompt the sharing of highly personal emotional information, they may not be best to administer during the very first encounter with a client or in the context of a diagnostic clinic where the examiner will not be the one who is later administering the therapy. The following is a list of the attitude scale options:

- *Modified Erickson Scale* (S-24; Andrews & Cutler, 1974)
- *Communication Attitude Test* (CAT-R; Brutten, 1985; Brutten & Dunham, 1989)
- *Overall Assessment of the Speaker's Experience of Stuttering* (OASES; Yaruss & Quesal, 2006)
- *Self-Efficacy Scale for Adult Stutterers* (SESAS) and *SEA Scale: Self-Efficacy Scaling for Adolescents Who Stutter* (Manning, 2001)
- Individualized interview regarding attitudes and emotional reactions

Other Speaking Conditions

There are many other possible speaking conditions and factors related to the client's stuttering that the clinician may wish to observe and evaluate. Because often people who stutter are relatively more fluent on shorter, less complex utterances, it may be useful to observe speech on a set of sentences that are systematically increased in length and linguistic complexity. Similarly, the clinician may want to observe the client's speech in tasks such as picture naming, automatic series, imitation and unison, to appreciate which demands and conditions aid or stress fluency. If a client's stuttering tends to be mild, the client may agree that the clinician should observe speech under added stress factors such as speaking on the telephone, time pressure, interruptions, with groups, and so on. Therapeutic probes may be employed to observe how well the client responds to various fluency-enhancing techniques or to identification and modification instructions.

As with any speech-language assessment, the examiner should not neglect to note other possible disabilities or factors that may influence the client's speech and communication skills. These may be in areas of articulation, phonology, vocabulary, syntax, semantics, pragmatics, attention, cognition, word-finding, fine/gross motor, oral-peripheral/oral-motor, voice/resonance, intonation/prosody, respiration, and hearing/auditory processing.

Interpretations and Treatment Recommendations

Diagnosis

As explained at the beginning of the chapter, the diagnosis of stuttering in adolescents or adults is not apt to present much of a challenge. In the great majority of cases, the correct diagnosis has been made by the client. The clinician's main goal is to describe, quantify, and assess the various aspects of the stuttering disorder. In some cases, differential diagnosis from other fluency disorders (see Chapter 15), or faked stuttering, is called for. Other problems of communication or different suspected health issues may be revealed or just suspected. All these should be reflected in the final assessment. On occasion, the inexperienced clinician, when individuals with very mild stuttering seek intervention, the inexperienced clinician may be inclined to question whether the speaker's perception of the disorder is valid or out of proportion with the actual difficulty. The reality of the stuttering disorder in such cases should be apparent by means of the following analogy. Imagine that your knees suddenly and unexpectedly buckled under you about twice each week. Wouldn't it be enough to make you seek out a doctor? Similarly, even occasional stuttering episodes can be sufficient to generate a sense of great vulnerability for a speaker. In fact, it is precisely because these moments occur infrequently and surface when least expected that they pose such an insidious threat. The client with mild stuttering can still benefit from intervention strategies and counseling.

A related issue is how much of the client's stuttering is hidden or suppressed compared to what would be observed without the client's coping mechanisms. If advanced stuttering reflects a genetic factor for the individual, then the evaluation may need to focus more crucially on finding out the nature of a client's coping mechanisms. How well is the client able to describe and discuss characteristics of his or her coping mechanisms? Which coping mechanisms might best be left alone at this time, and which ones is the client most needing or wanting to change?

Treatment Recommendations

When all the assessment results are analyzed, clinicians should first determine if therapy is warranted and, if positive, how will they be useful toward selecting, or recommending, appropriate treatment. Naturally, one of the most important considerations will be what the client envisions as his or her goals in treatment. Are those goals realistic? How will the client's vision of the clinical intervention process need to be brought into alignment with how the clinician understands that process? The stuttering assessment should inform the clinician about how the client views the stuttering so that these questions can be addressed.

How do the speech characteristics guide the planning of treatment? In addition to providing a pretherapy baseline to evaluate progress, the clinician should have observed the speech characteristics in terms of the patterns of movement of various anatomical structures (i.e., lips, tongue, jaw, neck/larynx, and chest). How does their positioning, timing, and tenseness differ from what is associated with typically fluent speech?

Does stuttering tend to occur at the most common location of utterance initiation? Then a slower, easier approach to starting to talk may be an appropriate strategy to develop. Does the speaker have a high level of tension in the articulators? Then a more gentle, relaxed approach to their movement and contacts may be needed. Does the speaker hold his or her breath when starting to talk? Instruction for appropriate breath support may help. Are reactions and attitudes toward speech and stuttering

preventing progress with speech change? Then these fears and avoidances may need to be addressed through counseling and desensitization activities. Do nonverbal behaviors or suprasegmental speech characteristics (e.g., irregular rate patterns, awkward phrasing, lack of eye contact, etc.) interfere with communication? Then these may need attention in therapy. How big is the factor of secondary characteristics? Although these tend to lessen or disappear of their own accord as the core stuttering and avoidance behaviors are decreased, occasionally secondary characteristics may need to be dealt with directly through awareness and self-monitoring. Additionally, each individual will have specific situations to address depending on their life roles (e.g., student, family relations, etc.), vocation, and recreational/social interests and needs. Finally, information obtained regarding past therapy experiences should be taken into consideration in deciding the future course of therapy.

The Diagnostic Report

The example of a speech evaluation report in Table 9.6 reveals the types of information obtained from a stuttering assessment. It also offers a model of possible wording and content organization for professionals who are new to reporting in this area.

Table 9.6: Sample Diagnostic Report

The Greater Midwest
Speech & Hearing Center

1818 Mid-continent Blvd.
Chatter City, USA 77778

SPEECH EVALUATION REPORT

Name: Basil Karger
Birthdate: 01/01/10
Age: 23
Gender: Male
Address: 510 Snow Rd.,
Chatter City, USA, 77778

Date of Evaluation: 01/01/10
Informant for History: Self
Clinic File No.: 1111112
Diagnostic Code No.: 333
Diagnosis: Stuttering

COMPLAINT AND REFERRAL

Basil, a 23-year-old male, was seen at his request at The Greater Midwest Speech and Hearing Center for evaluation of his stuttering. Basil, a college graduate who works in the receiving department of a major furniture store, feels the stuttering is distracting to other workers in the facilities, delivery drivers, and personal friends, and interferes in his career development.

HISTORY

Basil was raised on a farm near Chatter City. He is the youngest of four siblings, with only one of them being a full-blooded sib. He is the only one of the four who has ever stuttered. Basil did state, however, that his father had a stuttering problem that he overcame on his own after college. No other relatives were known to stutter.

Basil could not recall exactly when he began stuttering, but said he was aware of it at approximately 8 years of age. There was no recollection or knowledge of any medical or traumatic experience that precipitated the onset of stuttering. He also related that his family has always accepted his speech problem and that rarely have there been comments made on it.

Table 9.6: Continued

high school years, tension was intensified due to meeting new teachers and peers, as well as increased academic responsibilities, resulting in Basil's stuttering becoming more severe. In college, at speaking situations, and speaking with friends were thought by him to be relatively easy. Stress speaking to professors and in front of classes posed more difficulties. Basil received previous speech therapy at another time for approximately 2.5 years during his high school senior year and his undergraduate years at a community college. He recalled "cancellations," and "pull-outs," as the major therapeutic techniques, and felt that they were effective. Therapy was terminated by mutual decision of the clinician and client after they felt sufficient progress had been made. Recently, however, stuttering had increased.

EXAMINATIONS AND OBSERVATIONS

Percent Speech. An analysis of a 566-word sample of Basil's conversational speech revealed a total of disfluencies. An average of 25.97 per 100 words. The breakdown of this figure according to specific frequency types and categories is shown in the chart.

		Conversation (566 wds.)	Reading (463 wds.)
Part-word repetitions		7.95 (45)	1.94 (9)
One-word repetitions		3.36 (19)	0.65 (3)
Dysrhythmic Phonation		5.83 (33)	0.65 (3)
	SLD Subtotal	**17.14 (97)**	**3.24 (15)**
Phrase repetitions		2.12 (12)	1.51 (7)
Interjections		6.01 (34)	4.31 (20)
Revisions		0.71 (4)	0.04 (2)
	Other Disfluency Subtotal	**8.83 (50)**	**6.26 (29)**
	Disfluency Total	**25.97 (147)**	**9.50 (44)**

As can be seen, the predominant types of disfluencies in Basil's speech were part-word repetitions and dysrhythmic phonation (sound prolongations and blockages). The clinician estimated the average repetition lasted two additional units (e.g., bu-bu-butt, although sometimes three and four extra units were produced. Sound prolongations often lasted 2 s or more. Although Basil indicated no specific phonemes on which he had more disfluencies, it was noted that they occurred quite consistently on words or syllables beginning with the vowel /æ/. Basil exhibited relatively fluent speech in reading both The Rainbow Passage and My Grandfather, a 463-word combined sample. The total SLD in this task was 3.24 per 100 words. Postponement behaviors observed were primarily in terms of interjections that tended to help instances of severe stuttering. His disfluency in reading was less severe than in conversation.

Secondary Characteristics. Physically tense movements that typically accompany stutter events were observable as Basil spoke. Eye blinking, poor eye contact, and neck and facial muscle tension occurred and were held the rest of his body rather still.

On judging the impact of both the disfluency and the secondary characteristics on a 7-point scale for overall rating severity of stuttering, with 1 being very mild stuttering and 7 being very severe stuttering, Basil's speech was rated by the clinician at 5, although moments of more severe stuttering did occur.

Speaking Rate. Basil's conversational speech was timed. His average overall speaking rate, 132.5 words per minute, was below normal range.

Table 9.6: Continued

Voice. During testing, Basil's voice quality was characterized by glottal fry and voice breaks. His optimal pitch was assessed by estimating the pitch level approximately a fourth from the bottom of his total pitch range. In conversational speech, Basil spoke at a lower pitch than the estimated optimal. Indeed, when asked to read in a monotone, the pitch he used was the same estimated as the optimal.

Speech Mechanism. The speech mechanism appeared both structurally and functionally adequate for speech.

Language. Although no formal language assessment was done, Basil used both vocabulary and syntax appropriate for his age and education level.

Hearing Screening. An audiometric screening was administered at both 25 dB HTL and 15 db HTL (re ANSI 1969) with a portable Beltone audiometer. The following frequencies were tested bilaterally: 250, 500, 1000, 2000, 4000, 8000 Hz. Responses to all stimuli were consistent.

Client's View. Asked to describe the experience of a stuttering block, Basil said he felt "tension and inability to speak." He felt like "a hundred things were going on in his mind at once." After the moment had ended, he experienced a great relief, "like a weight off his chest." Basil stated that he felt the cause of his stuttering was nervousness. Asked what he does to change his stuttering, he said, "Trying to relax, slow down, and sometimes take aspirin hoping it would calm me down." Basil felt that some situations increase the severity of his stuttering. It is more difficult for him speaking to a group than to individuals, also speaking to strangers (e.g., various people with whom he has to communicate on the job) than to familiar people. He added, however, that he feels most people generally ignore his stuttering, although some former colleagues in college expressed difficulty in listening to, and understanding him, although He is often afraid to talk when expected to. On a 9-point scale of speech naturalness, Basil self-rated his speech as 7, which is rather unnatural. Among anxiety-producing situations he also listed speaking with people having authority, such as former professors and current superiors, at his work environment, having to talk after arriving late to a meeting, and some phone conversations. It was also mentioned that Basil's stuttering seems to increase when he does not sleep enough.

Attitudes. Basil was administered the Modified Erickson Scale (S-Scale) and received a score of 37 points out of a possible 39, which would seem to reflect a very low attitude toward speaking when compared with normal speakers.

Social Effects. Asked about how stuttering influences his life, Basil replied that he feels avoidance reactions to various situations. In discussing plans for the future, he stated that he would prefer jobs that required less frequent speaking then his current one. He felt it would be unrealistic to do otherwise because the stuttering would always be there. As far as dealing with current social situations, Basil did not feel that his stuttering keeps him much from being more socially active than he currently is. Still, he is rather comfortable with a number of his friends, and stutters less when he is talking with people he knows. Although he dates women, he admits to some obstacles in this domain.

CLINICAL IMPRESSION

Throughout the diagnostic session, Basil exhibited moderate to severe stuttering in terms of the frequency, types, and length of disfluencies that were accompanied by several secondary characteristics and the usage of an inappropriately low voice pitch and significant components of glottal fry. His stuttering during oral reading was less severe in frequency and intensity than in conversation. The affective reactions to the stuttering are strong. Basil's stuttering clearly interferes with his personal life and professional career and aspirations. Although the speech therapy he received 2.5 years ago provided improvement, it is apparent that Basil needs additional therapy that will target the overt stuttering, voice, and affective reaction. Basil has expressed a desire to begin speech therapy, and stated his main goal to accomplish is to be able to go before a group of people without stuttering much and be able to handle it better.

Table 9.6: Continued

RECOMMENDATIONS

- recommended that Basil Karper be enrolled in therapy for remediation of stuttering voice
- effective reactions

2. 3rd Clinicians   . . . .

Posing Clinician   . . . .

Summary

Stuttering assessment typically involves the major components of case history and client interview, speech sampling and analysis, supplemental speech tasks, emotions related to speaking and stuttering, and other factors impacting the client's personal, social, and professional life. To individualize assessment appropriately, the clinician considers the selection of speech sample contexts, speech character-istics and nonverbal concomitants to be analyzed, frequency measures, severity scales, speaking rate measures, and protocols for the examination of attitudes and/or reactions. The clinician has considerable choices of procedures and meas-ures of the various aspects of the overt stuttering as well as an array of instruments to evaluate the emotional component. A thorough assessment involves informal screenings, such as of the parameter of voice, and an appraisal of the client's over-all profile of communication abilities, especially his or her strengths. An in-depth assessment provides an essential foundation for the selection of treatment goals and objectives.

STUDY QUESTIONS AND DISCUSSION TOPICS

1. Which assessment procedures help the clinician discover the extent of the client's stuttering variability?

2. Pretend you are administering the stuttering evaluation, and explain to your client the reason for including each of the components in your assessment: speech samples, attitude protocols, and so on.

3. In what ways is the client required to engage in self-assessment during the clinical evalua-tion? How can the clinician help to ensure that the client uses that self-assessment constructively?

4. Compare and contrast the two measures pe-centage of syllables stuttered and frequency disfluency per 100 syllables.

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Part Three/Clinical Management of Stuttering

Appendix 9.3

Mean Frequency of Disfluency Types per 100 Syllables for 500-Syllable Samples of the Job Task (Spontaneous Monologue) by 30 Adult Men

Disfluency Type	Mean	
Part-Word Repetition	0.23	
Whole-Word Repetition	0.58	
Prolongation	0.24	
Tense Pause	NA	
CORE Subtotals		1.06
Interjections	3.96	
Phrase Repetitions (and Multisyllable Word Reps)	0.26	
Revisions	1.08	
ACCESSORY Subtotals		5.30
OVERALL Totals		6.36*

* This value represents the total of these data. It differs, however, from the 6.52 they report.

Source: Adapted with permission from Elsevier (New York) from P. Roberts, A. Meltzer, and J. Wilding, 2009, Disfluencies in non-stuttering adults across sample lengths and topics, *Journal of Communication Disorders, 42,* 414–427.

Appendix 9.4

Frequency of Disfluency Types per 100 Words in an Oral Reading Context for 13 Male and 4 Female Adults Who Stutter

Disfluency Type	Mean	
Part-Word Repetition	5.34	
Whole-Word Repetition	0.41	
Disrhythmic Phonation (prolongation + broken word)	5.06	
Tense Pause	NA	
CORE Subtotal		10.81
Interjections	0.60	
Phrase Repetitions	0.30	
Revisions	0.72	
ACCESSORY Subtotals		1.62
OVERALL Totals		12.43

Source: Adapted with permission from The influence of noise on stutterers' different disfluency types by E. Conture and E. Brayton, *Journal of Speech and Hearing Research, 18,* 381–384. Copyright 1975 by American Speech-Language-Hearing Association. All rights reserved.

Appendix 9.5

Frequency of Disfluency Types per 100 Words in Spontaneous Speech for 10 Male and 10 Female Adults Who Stutter, Ages 19–48 Years

Disfluency Type	Males	Females

Source: Reprinted with permission from Women who stutter: Personality and speech characteristics by L. Silverman and C. H. Zimmer, *Journal of Speech and Hearing Research 22,* 553–564. Copyright 1979 by American Speech-Language-Hearing Association. All rights reserved.

Appendix 9.6

Frequency of Disfluency and Types per 100 Words in Story Narratives for 56 Male Children Who Stutter and 56 Male Children Who Do Not Stutter

Disfluency Type	Stuttering Males			Nonstuttering Males		
	Q1	Q2	Q3	Q1	Q2	Q3

Figures are for the first (Q1), second (Q2), and third (Q3) quartiles.

Source: Reprinted with permission from Disfluency behavior of elementary-school stutterers and nonstutterers by F. Silverman, *Language, Speech, and Hearing Services in Schools, 5,* 32–37. Copyright 1974 by American Speech-Language-Hearing Association. All rights reserved.

Chapter Nine/Assessment of Adults and School-Age Children