

Chapter 5

Martine Vanryckeghem

Assessment of stuttering-related Affective, Behavioral and Cognitive components leading the way to differential diagnosis and treatment objectives

Diagnosis

The Greek meaning of “diagnosis” (diagnostikos: dia=between; gno=to know) refers to a *scientific discrimination, distinguishing between or discerning* different prospects, discovering the nature (and possibly cause) of a disease, a condition, a problem, or a phenomenon, and to identify it through its signs and symptoms. Diagnosis follows an evaluation, an assessment that should be thorough, evidence-based and broad, although specific enough to cover all bases that may play a role in the problem at hand. The aim is for the assessment to lead to a correct diagnosis and decision, and to reduce as much as possible false positive (type I error; false alarm) or false negative (type II error; miss) outcomes. In the case of stuttering, these errors would respectively entail diagnosing someone as a person who stutters (PWS) when they are actually a person who does not stutter (PWNS), and diagnosing someone as a PWNS when, in reality, they are a PWS. Decreasing type I and II diagnostic errors should, by definition, decrease clinical mismanagement (Vanryckeghem, 2018).

Assessment and subsequent treatment should follow the guidelines stipulated by the World Health Organization’s (WHO) *International Classification of Functioning, Disability and Health* (ICF) (WHO, 2001) describing the significance of disorders. Aside from ‘body function and structure’, the framework incorporates the components ‘activities and participation’ and ‘environmental and personal factors’. Specifically in fluency disorders, *body function and structure* directly relate to differences in brain anatomy and functioning, neuro-motor control, and the interruption of the forward flow of speech. The latter is measured through observable types of disfluencies, the frequency with which they occur, and the presence of tension or effort, etc. In addition, it includes the observation of behaviors of avoidance or es-



cape, behaviors that are secondary to the stuttering and which are being employed in anticipation of, or during, stuttering. *Activities and participation* relate to how a person's speech ability might limit or seriously affect their daily communication. This encompasses inter-personal interactions in educational and professional settings, in their personal life, and in all possible situations that involve speaking and might impact an individual's quality of life. *Environmental and personal factors* comprise both the perspective of the speaker as well as the listener. How do speakers perceive and react to their fluency disorder? What do they think about their way of communicating? What is their communication attitude and self-esteem? What sounds, words and/or situations are seen as difficult and are feared? What is their level of frustration, shame and guilt? How do they perceive their communication partner and the environment? Have there been instances of teasing, bullying or joking? Has support been sought for stuttering e.g. in terms of attending support groups? Is encouragement present in the immediate environment? These ICF components need to be investigated during the assessment of individuals with fluency disorders through multi-modal observation augmented by self-report.

Multi-dimensional disorder

The ICF framework and the multi-dimensional components surrounding stuttering go hand in hand. It is abundantly clear that stuttering is more than a "speech impediment". Sheehan's (1970) iceberg analogy is known by most practitioners and provides a very insightful image of the limitations of describing what occurs in the PWS only in terms of observable disfluencies. Clearly, the observable behaviors are just the "tip of the iceberg". The PWS encompasses so much more – elements that are not overt but very much present nevertheless – and components that are "below the surface" comprising the covert affective, behavioral and cognitive dimensions. The totality of the overt behaviors and covert reactions to stuttering is what makes up the "person" who stutters. In other words, the stut^{terer} is defined by more than just stuttering. The stuttering and its correlates are known to have an enormous impact on personal, social, academic, and professional aspects (amongst others) of a person's quality of life.

The different dimensions that are characteristic of the PWS are assessed by means of evidence-based test procedures, which lead to a solid differential diagnosis in terms of the presence of a fluency disorder that is characteristic of stuttering. The diagnosis may, however, point to fluency disorders of a different nature, such as cluttering, or neurogenic or psychogenic disfluency. In addition, the test procedures should ideally point to individualized strategies and tactics of therapy. One can question what value a severity determination has as the main outcome

of an assessment. What does the statement that a “client is a moderately-severe PWS” indicate, how does one use this information and what does it lead to in terms of management? Apart from pointing to baseline data against which to compare treatment outcomes, a severity determination, in and of itself, does not provide target-specific treatment information. Instead, an assessment incorporating the Affective, Behavioral and Cognitive components (ABCs) present within the PWS which identifies the problems in each of these domains, serves as a road map for treatment, and seems to be a more effective way to assess, and subsequently treat, a PWS.

Observation and Self-report

During a fluency evaluation of a PWS, the ABCs should be explored. These include the affective reactions to sounds/words and speech situations, the behavioral components of stuttering and other disfluencies, the coping behaviors, as well as the cognitive reactions such as speech-related belief and attitude. To investigate these, both clinician observations and client self-report come into play. The reliability of a disfluency count has been repeatedly questioned (Cordes & Ingham, 1999; Ingham & Cordes, 1992) in terms of intra- and inter-rater reliability, which brings into question the validity of the measurement used. Although not universal, there is the issue of the unclear operational definition of stuttering and other disfluencies – some undefined and molar, others more molecular – making the comparison and interpretation of data questionable. Also, the count procedures differ: in some instances the percentage of words stuttered is calculated; in others a syllable unit is used. Thus, the basic premise of any assessment should be that it employs well-operationalized definitions and data-bound measurement procedures to reach solid evidence-based differential diagnostic decisions, to reduce type I and II errors as much as possible.

Self-reporting

When assessing the experiential nature of the covert components faced by a PWS as it relates to their stuttering, many scholars, researchers and clinicians agree that the use of self-report is essential (Guntupalli et al., 2006). These intrinsic features of the problem faced by a PWS should not go unattended. Covert affective, behavioral and cognitive variables can serve to more fully characterize the *person* who stutters. The clinician needs to seek ways to augment and complement the clinical observations of the type and frequency of dysfluency, to include and explore the



intrinsic features of stuttering that are experiential in nature rather than directly observable. This broadening of the meaningfulness of elements that characterize the PWS and impact their quality of life includes personal reactions that are not directly observable, but give a “*view from within*”; an “*inside view*”.

Self-report data can be gathered in formal and informal ways. Formal assessment might include standardized, norm-referenced, data-bound, psychometrically sound tests investigating the reactive aspects and impact of stuttering. Informal ways to assess the covert aspects related to stuttering might include client interviews, writings or drawings provided by the client, among others.

Case history

A thorough assessment starts with obtaining a fluency-specific case history from the client or their parents. This document forms the basis for the next steps in the client’s assessment because it provides valuable information that will be necessary to fully understand the path that the client has already traversed in terms of the speech disorder at hand. It will make background information available and help guide assessment as well as treatment.

General information typically requested in case history forms regards general health, medical history, pre-, peri- and post-natal information, developmental milestones, educational background, occupation, languages spoken, medical history, stress level, psychologically or neurologically-related events, etc. Aside from this, it is important to inquire about past and present fluency-related issues and previous treatments of any kind. When the client has had speech therapy, its type, length, and effect needs to be explored, as well as the extent to which the client knew the targets and purpose of the treatment procedures utilized, and whether or not these were successful in modifying their stuttering. Some questions refer to a family incidence of persistent stuttering or recovery, the age at onset of stuttering, and whether any special circumstance surrounded the onset. For children specifically, it is important to know if the stutter is episodic or chronic in nature. The parents are also specifically asked what, in their opinion, caused the stutter. This is probed because, even nowadays, parents might imagine that some of their actions caused the stutter, e.g. getting divorced, moving to a different location, etc. This will become crucial information when counseling parents.

One section of the case history form deals directly with a statement of the problem: a description of variables surrounding the disfluency. The client or the parents are questioned about what they think the characteristics of the speech are: a predominant presence of repetitions or prolongations, the locus of the stutters, the speech rate and rhythm, the presence of tension and its locus, and breathing issues.

Information is gathered relating to anxiety when entering a particular situation or saying a certain sound; how the person perceives the reactions of others; if stuttering has impacted their social, educational, or professional life; and their level of concern and frustration. The presence of anticipation is questioned, as is the use of avoidance and escape behaviors, and whether they have helped. For adults, it is important to gauge their opinion as to what percentage of their speech is disrupted during conversation. This is very useful information in terms of how the client perceives their stuttering and its handicapping condition, and the level of impact it has on daily life. This knowledge is valuable in treatment during “reality training”. For adults as well as for the parents of children, the case history form ends with a question about what is hoped to be accomplished if therapy is warranted.

The case history information is the basic and foundational component of each assessment. The more facts the client provides, the better will the clinician be able to tailor the treatment to their individual needs. The case history guides the client interview, where the clinician dives more deeply into the information that the client has provided. This background information, together with other self-report data, clinician observations and client interview help put together the totality of the assessment jigsaw.

Self-report: Formal Assessments

Formal assessments, using standardized test procedures and scoring patterns are data-driven and evidence-based, and support the conclusions drawn from the test results. Before use, their psychometric value should be evaluated in terms of reliability and validity. Scores expressed in means and standard deviations, percentiles, stanines, or standard scores are typically provided.

These standardized measures allow comparison of a client's self-report score with that of a statistically selected group of test-takers. These statistics support the conclusion that is drawn for the individual client based on the norming group data. Some of the standardized self-report measures used in the field of fluency disorders are ‘state’ tests; others are ‘trait’ tests (Spielberger, 1989). The former measure explores a temporary event in a particular situation experienced for a short period of time; the latter relates to a general, more permanent trait, that is not situation dependent.

Self-report: General Emotional Reaction

A PWS might suffer from generalized anxiety and/or social anxiety. Studies have repeatedly pointed to the presence of social anxiety disorder among individuals



who stutter, with varying degrees of prevalence: 21%–69% (Blumgart et al., 2010; Iverach, O’Brian, et al., 2009; Kraaimaat et al., 2002; Menzies et al., 2008; Stein et al., 1996). Given this information, it seems a *sine qua non* to include evaluation of generalized anxiety and social anxiety disorder, to screen for significant trait and state anxiety which is unrelated to speech. In the event that the anxiety self-report test and/or physiological measures, supported by interview-gauged information, reveal a significant amount of general or social anxiety, a referral for a full psychological evaluation seems warranted, given that addressing the anxiety non-specific to speech might be out of the realm of the speech-language pathologist’s knowledge and skills, and need more specialized attention.

Self-report of the Speech-specific ABC Dimensions

There is general agreement that the Affective, Behavioral and Cognitive (ABC) components of stuttering are highly linked to, and intertwined with, each other. The most systematic way to evaluate these dimensions is by using standardized self-report scales that bring data-bound attention to the reactive variables that surround stuttering. Self-report tests differ in the way they investigate and score the ABC dimensions surrounding a PWS. Some test procedures’ score and/or sub-scale scores cut across a mixture of various reactive and behavioral elements, whereas other tests separately explore the reactions that are part of the stuttering disorder, and their impact on a PWS. The ABC tripartite model clearly differentiates the affective, behavioral and cognitive (attitudinal) dimensions and uses different means for assessing each of them. Self-report scales that follow this model aim to singly measure each of the ABC components, and their items specifically explore those variables, whereas other tools might simultaneously assess cognition, affect, speech disruption and/or the use of coping behaviors.

Behavior Assessment Battery (BAB)

The *Behavior Assessment Battery* (BAB) sub-scales presented below (Brutten & Vanryckeghem, 2003a,b, 2007; Vanryckeghem & Brutten, 2018, 2020a, 2021) each separately investigate the multi-dimensional facets of the PWS in an unconfounded way. This does not mean that each component stands on its own, but rather that the dimensions cut across and interact with each other, as presented in the Venn-diagram (Figure 1). The BAB’s underlying premises are that the definition of the test dimensions must be specifiable, operational, reliable and valid. The information obtained through the tests’ dimensions should assist in reducing Type I and II diagnostic errors.

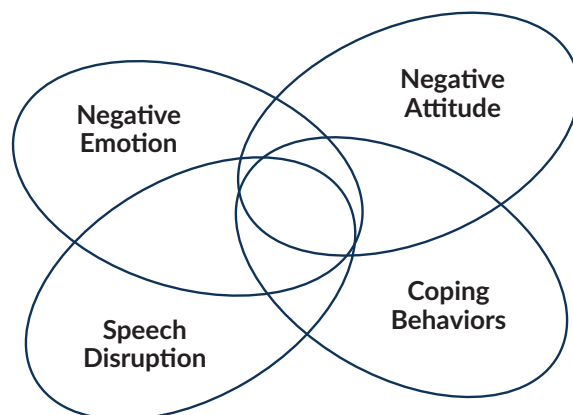


Figure 1: *Behavior Assessment Battery's* Affective (Negative Emotion), Behavioral (Speech Disruption and Coping Behaviors) and Cognitive (Negative Attitude) components

Each of the BAB self-report sub-tests investigates one of the ABC's related to stuttering and provides a score that is uniquely linked to each of these constituents. The test battery fits within the ICF framework and has been empirically researched cross-culturally in over 30 countries. It provides a multi-dimensional evidence-based approach to differential diagnostic decision-making. The affective component is investigated by means of the 'Speech Situation Checklist – Emotional Reaction' while stuttering behavior is assessed with the 'Speech Situation Checklist – Speech Disruption'. The use of avoidance and escape behaviors is inventoried in the Behavior Checklist, and the cognitive dimension is gauged with the *Communication Attitude Test*. Two standard deviations above the mean of typical speakers (PWNS) is taken as the cut-off point for determining if a score is atypical and clinically significant. The test manuals and the peer-reviewed publications describe the tests' solid psychometric properties (Jones et al., 2021; Brutton & Vanryckeghem, 2003a,b, 2007; Vanryckeghem & Brutton, 2007, 2015a,b, 2017, 2018, 2020a,b,c,d,e, 2021; Vanryckeghem et al., 2005; Vanryckeghem & Mukati, 2006; Węsierska et al., 2020; Węsierska et al., 2018).

BAB Affective component: Speech Situation Checklist – Emotional Reaction (SSC-ER)

SSC-ER assesses speech-specific negative emotional reactions (concern, worry, fear or anxiety) to interpersonal speech settings (e.g. talking to someone you don't know or trying to make a good impression) and/or to situations that require the use of certain words (e.g. giving your name, reading a fixed passage aloud, or



saying a sound or word that has previously proved troublesome). The self-report test describes 38 (for adults) or 36 (for children) speech situations that need to be rated by the individual (on a 5-point Likert scale) for the level of anxiety that a particular situation evokes. The client's ratings are summed and compared with the normative data (Chowkalli Veerabhadrapa et al., 2021; Vanryckeghem et al., 2017). Aside from the total score information, the item ratings give immediate direction to therapy, and specific attention can be given to situations that have been identified as anxiety-provoking (having scored 5, 4 or 3). These situations which are causing a high level of worry and anxiety will be targeted in treatment through e.g. desensitization procedures.

***BAB Behavioral component: Speech Situation Checklist -
Speech Disruption (SSC-SD)***

In the SSC-SD component – which is administered independently of SSC-ER – the client rates the extent of speech disruption (stuttering) in the very same speech situations found in the SSC-ER section, again on a 5-point Likert scale. Scoring and interpretation of the data also follow the same principles as in SSC-ER. Factor analysis again points to word-specific items, such as giving your name and naming in general, and situation-specific items like telephone-related events, formal speech situations, or talking to a supervisor or boss, etc. SSC-ER and SSC-SD are scored separately, and their data are compared in terms of whether the total scores correlate, as is typically the case with PWS, or are widely disparate as might be seen among neurogenic or psychogenic dysfluent individuals. The specific test items are also compared in terms of their score similarity (more or less anxious – more or less stuttering on the 5-point Likert scale) and scrutinized in the light of whether the situations have something in common.

BAB Behavioral component: Behavior Checklist (BCL)

The BCL gathers information about a client's speech-associated coping behaviors that are secondary to stuttering. The test itemizes 30 (for children) or 60 (for adults) behaviors associated with, or exhibited during, the act of speaking, that are used to avoid or escape negatively charged speech situations and/or words. These behaviors include the movement of body parts, aberrant breathing and voicing, changes to the rate and way of speaking, the use of word substitutions and interjections, etc. Children indicate, by means of "Yes" or "No", whether they use each particular behavior to cope with their stuttering, while adults also indicate the frequency with which a particular behavior is used (also on a 5-point Likert rating scale).

The number and type of coping behaviors that a client employs as a means of aiding speech are inventoried. Aside from a total score, which can be compared to that of PWNS in light of whether or not it is significant, attention is turned to the BCL items because they detail the types of avoidance and escape behaviors being used concomitant with stuttering (Vanryckeghem et al., 2004). Whether coping responses are employed predominantly as adjustments to particular sounds/words or to speech situations can be determined. In treatment, those coping behaviors that stand in the way of speech improvement can be dealt with through target awareness and omission. After a person is made aware, in a stepwise fashion, of a particular coping behavior being used, its reduction can subsequently be pursued.

BAB Cognitive component: Communication Attitude Test (BigCAT, CAT, KiddyCAT)

Speech-associated attitude is a fundamental component of the speech disruption, negative emotion, and coping behaviors that characterize PWS. Automatic thoughts, imaginings, and self-verbalizations can be rational (real) or irrational, and be intra- and inter-personal. When cognitions become irrational, they can have various deleterious effects: influencing speech, strengthening the stuttering behavior, serving a mediating and controlling function, and prohibiting the PWS from dealing with problems in a constructive manner. When certain cognitions stabilize to form a more permanent totality of negative thoughts and anticipations, a negative communication attitude is established (Vanryckeghem, 2019). Speech-associated attitudes affect the way a person thinks about their speech and communication, their self-perception as a person, and their view of the communication partner who they might perceive as perfectly fluent, and perhaps critical or pitying. It has been shown that in general, a PWS thinks negatively about their own speech, perceives speaking as difficult, unpleasant, and challenging, and envisages themselves as being inherently unable to produce fluent speech. This negative self-image as a PWS first and foremost, has far reaching consequences, and inter- and intra-personal reactions – often irrational – may start to dominate the thinking of the PWS. They might perceive their stuttering as the cause of academic failure, the basis for a lack of friends or an intimate relationship, or the reason for not advancing in their profession.

The Communication Attitude Test for Adults who Stutter (BigCAT)

The BigCAT is a purely cognition-based measure of communication attitude, whose items specifically explore speech-associated belief. The client reflects on 34 statements and indicates (true or false) whether each item represents what they pres-



ently think about their speech. A positive attitude receives a zero score, a negative thought is scored as 1. The higher the BigCAT score, the more it indicates negative speech-related thinking. In a very powerful way, with minimal overlap, the BigCAT differentiates the way PWS think about their speech from that of PWNS (Chowkalli Veerabhadrapa et al., 2021; Jansson-Verkasalo et al., 2021; Valinejad et al., 2018; Vanryckeghem & Brutton, 2011, 2012; Vanryckeghem & Muir, 2016). Aside from the total score, the clinician will pay attention to the answers to specific test items and separate out the attitudes to speech that are negative from those that are not. Negative speech-associated beliefs tend to impede improvement and require a cognitive-behavior change. Positive speech-related beliefs can be used as building blocks for the development of an attitude that helps produce, support, and maintain improvement.

The Communication Attitude Test for School-age Children who Stutter (CAT)

The CAT is the cognitive component of the BAB for children who stutter (CWS) and can be used with youngsters between the age of six and 16. Similar to the BigCAT, the CAT contains 27 true/false items which reflect directly on speech-related attitude. Group comparisons repeatedly reveal between-group differences (CWS versus CWNS) that are statistically significant from the age of six, which is a confirmation that CWS generally view their speech as significantly more negative than CWNS do (Bernardini et al., 2009; Chowkalli Veerabhadrapa et al., 2020; Gačnik & Vanryckeghem, 2014; Kawai et al., 2012; Vanryckeghem, 1995; Vanryckeghem & Brutton, 1992, 1996, 2020d; Vanryckeghem et al., 2001). Similarly to the BigCAT, the CAT's items will be used in cognitive-behavior therapy to address mal-attitude.

The Communication Attitude Test for Preschool and Kindergarten Children who Stutter (KiddyCAT)

The KiddyCAT is an easy to administer self-report test for children between the age of three and six, which explores speech-related attitudes that occur closer in time to the onset of stuttering. The client is asked to respond 'yes' or 'no' to 12 simple, verbally-presented questions. The test's play-based administration makes it possible for these young children to answer the questions, and to determine if a child's speech-associated attitude is typical of a CWNS, or atypical and more like that of a CWS. Given that a negative speech-associated attitude increases with age (Vanryckeghem & Brutton, 1997), it is important to gauge the presence of mal-attitude as close in time as possible to the onset of stuttering.

Cross-cultural investigations have pointed out that, as a group, CWS as young as age three report thinking negatively about their speech (Aydin Oral et al., 2022; Jansson-Verkasalo et al., 2021; Neumann et al., 2019; Novšak Brce & Vanryckeghem, 2017; Novšak Brce et al., 2015; Schafiei et al., 2016; Vanryckeghem & Brutten, 2007; Vanryckeghem et al., 2015; Węsierska & Vanryckeghem, 2015; Węsierska et al., 2014).

Other formal assessment protocols

Other self-report tests that investigate the ABC components related to stuttering do so either by means of separate tests or as a compound. Some tests are not multi-modal and investigate only one of these variables. Below is an excerpt of some of these self-report inventories.

Multi-dimensional tests

The *Wright and Ayre Stuttering Self Rating Scale (WASSP)* (Wright & Ayre, 2000) is an assessment tool that records an adolescent's or adult's self-perceived severity of stuttering pre- and post-treatment. Its five subscales include 1) behavioral components, encompassing frequency of stuttering, physical struggle, duration, rate, etc.; 2) negative thoughts before, during and after speaking; 3) feelings related to stuttering, such as frustration, embarrassment, fear etc.; 4) avoidance of words or situations; 5) discussion of stuttering and the level of handicap at home, at work, and educationally. The scale does not have normative data, and limited validity information, but has good internal reliability and test-retest reliability. Most data stem from treatment studies.

The *Overall Assessment of the Speaker's Experience of Stuttering (OASES)* (Yaruss & Quesal, 2006, 2016) consists of tests for three different age groups: OASES-S for school-age children (ages 7–12), OASES-T for teens (ages 13–17) and OASES-A for adults. The tests have four sections including 1) general information (about speech, stuttering, and related topics); 2) reactions to stuttering (feelings, behavior and attitude, combined); 3) communication in daily situations (general, home, school, social, work etc.); 4) quality of life (how stuttering impacts daily life). The test is based on an adaptation of the WHO's *International Classification of Functioning, Disability, and Health* (2001), and is validated internationally through empirical research. It has solid psychometric properties and provides a numerical and descriptive severity impact rating.



Affective

The *Fear of Negative Evaluation Scale (FNES)*, the *Brief Fear of Negative Evaluation Scale (BFNE-II)*, and the *Brief Fear of Negative Evaluation Scale-Straightforward (BFNE-S)* (Watson & Friend, 1969) all assess affective dimensions, and contain 30, 12 and 8 items respectively. These scales are used to measure fear of negative evaluation, a hallmark behavior seen in individuals with social phobia. Fear of negative evaluation is defined as feelings of apprehension about others' evaluations, distress over these negative evaluations, and expectations that others will evaluate one negatively. The test has strong psychometric properties which enables differentiation of those with and without social anxiety disorder (SAD). Its scores correlate significantly with other measures of anxiety, depression, and general distress in people with SAD. Although not a stuttering-specific measure, the test has been used in research with PWS.

The *Social Phobia and Anxiety Inventory (SPAI-23)* (Beidel et al., 2000) measures both social and agoraphobic anxiety. SPAI scales are available for different age groups: SPAI for adolescents (from age 14) and adults (Garcia-Lopez et al., 2008) and SPAI-C for children (Beidel et al., 2000). The SPAI-23 has been found to correlate highly with its 45-item parent scale (SPAI) and has similar psychometric properties. The test has convergent validity with the FNES and *Social Avoidance and Distress Scale (SADS)* (Watson & Friend, 1969). It has strong discriminant validity and test-retest reliability (Schry et al., 2012). Although not specific to stuttering, the test has been used to document treatment efficacy in PWS (Scheurich et al., 2019).

The *Inventory of Interpersonal Situations (IIS)* (Van Dam-Baggen & Kraaimaat, 1999, 2000) investigates the verbal-cognitive component of social anxiety. The IIS has two sections which gauge the level of discomfort (anxiety and emotional tension) in social situations, and the frequency with which social responses or skills are utilized. The IIS has five sub-scales: giving criticism, expressing opinion, giving a compliment, initiating contact, and positive self-statements. The test's 35 items relate to social situations that the client evaluates on a 5-point Likert scale in terms of discomfort (none – very much), and frequency of occurrence (never do – always do). Several internationally-based investigations have pointed to the IIS' validity and reliability (Kraaimaat et al., 2002; Van Dam-Baggen & Kraaimaat, 1999, 2000). The test is useful in assessing social anxiety in adults who stutter. Research has shown that PWS report significantly higher levels of emotional tension or discomfort in social situations, and a significantly lower frequency of social responses compared to PWNS. Moreover, a study indicated that about 50% of the IIS scores of PWS

fell within the range of scores of highly socially anxious psychiatric patients (Kraaijmaat et al., 2002).

Cognition

The *Locus of Control of Behavior Scale (LCB)* (Craig et al., 1984) measures the degree to which a person perceives a causal relationship between their own behavior/actions and their consequences/rewards. This 17-item Likert-type scale makes a distinction between two personality types: 'internal' (attributing events to being under one's own control), or 'external' (ascribing life events to external circumstances). Changes in LCB scores can predict fluency maintenance or relapse, and this information can help clinicians counsel their client in changing their attitude.

The *Erickson S-24 Scale* (Andrews & Cutler, 1974). This 24-item normed Attitude scale is capable of differentiating PWS from PWNS and has good internal reliability. Pre- and post-treatment data showed that increased maintenance of fluency correlates with a more positive communication attitude (Andrews & Cutler, 1974). Brutton and Vanryckeghem (2003a) found that four items did not correlate with their respondents' total score, and one item was linguistically outdated.

The *Unhelpful Thoughts and Beliefs about Stuttering* test (UTBAS / UTBAS-6) (Clare et al., 2009) measures cognitions to assess speech-related social anxiety in adults who stutter. The items were created by recording unhelpful thoughts and beliefs reported in PWS's case history, and from those who were in a CBT therapy program. Iverach and colleagues (2009, 2016) suggest that those scoring in the 5th decile or above be referred for a psychological evaluation. Normative data are provided for the test, and it was shown that PWS with a diagnosis of SAD scored significantly higher on UTBAS. Although the test is lengthy and its shorter version (UTBAS-6) might be more practical, the tests' items can be used to generate thoughts for PWS and clinicians to discuss within a cognitive restructuring task or other CBT protocols (Menziez et al., 2009).

The *Self-Efficacy Scale for Adult Stutterers (SESAS)*; Ornstein & Manning, 1985) and *Self-Efficacy Scale for Adolescents (SEA)* provide a hierarchy of speaking situations ranging from easy to hard and ask respondents to rate their confidence in entering a situation, and their confidence that fluency will be maintained in that situation. The test provides normative data and differentiates PWS from PWNS. It has good validity and is based on different underlying constructs. The scale can be used in treatment to introduce strategies aimed at increasing communication self-efficacy



and reactions to communicative situations. Increased self-efficacy in PWS has been linked to measures of higher resilience (Craig et al., 2011).

Self-report: Informal assessment

Informal assessments are not data-driven but are valuable to inform clinical intervention. A combination of several informal types of self-report can be used to obtain a more in-depth inside view of the individual who stutters.

A *Client Interview*, whether with child or adult, covers perceptions, feelings, behavior, attitude, etc., and needs to dig deeper into the information obtained through case history, self-report tests, and observations. The interview serves to gain clarification about background information, prior treatments, observations made by the clinician, and the self-report data obtained. It is important to gauge how informed the client is about stuttering and its phenomena, what they are seeking in the treatment, and their perceptions of self and others. The client interview provides a perfect venue to amalgamate information obtained via different sources, and to share with the client initial plans for the treatment road ahead.

A *parent/partner interview* might shed light on the level of knowledge the caregiver has about the nature of stuttering and its potential impact on the child's daily life. It can be used to investigate the parents' perceptions, feelings and attitudes about their child's stuttering, the way they believe their child reacts to their stuttering, and their potential worries and feelings of guilt. Information from the parent or life partner about the ABC components can be compared with the reports of the individual who stutters (Svenning et al., 2021). If different accounts of the experience of stuttering are expressed, these differences can be addressed and discussed. Via these interviews, one can explore phenomena that are not easily discovered through the client alone. The information obtained can be a starting point to create opportunities for parent/partner education and counseling.

A *teacher interview* provides insight into how a child functions within the school environment, which might be different from that in other settings. Teachers get to see the behavior of a child in a variety of situations that are not accessible to the parent or clinician. Obtaining the teacher's view will enable analysis of their knowledge, thoughts, and attitudes toward stuttering, and permits education of the teacher, if warranted. 'Does the child answer or pose questions in class?', 'Do they participate and speak in group activities?' are some examples of questions. It is important to find out if the child expresses frustration or embarrassment when

they have trouble speaking. How does the teacher respond when the child is having difficulty speaking, and how do the other students react? Are they being teased or bullied? (Blood & Blood, 2016). What does the teacher do to facilitate class activities (e.g. invite the child to be the first to read aloud)? This information is also crucial in terms of incorporating the classroom and the child's peers into the treatment program.

Drawing or art creation, writing a story or journaling, or creating a speaking log can all be used to discuss speech-related attitude and emotions, and the experience of stuttering. Depending on the age of the child, a drawing, or a story about what the child thinks about their speech, or how they feel about speaking, will shed light on the inner experience of stuttering. The child can also be asked to write down things they like about themselves or do well, versus things they are not so good at or do not like. As an ongoing assessment, the client can be requested to keep a journal about their everyday encounters involving speech. This insight into speech fluctuation in a variety of situations can be used to reflect on experiences and defuse certain negative thoughts. The journal also documents change over time.

The client can be asked to *design a situation hierarchy* listing the speech situations in order of difficulty – from least to most – that worry them and elicit stuttering. With children, a hierarchy ladder can be used for this purpose. This also gives the clinician some idea if/how the client links fear/anxiety in particular situations to their expected speech disruption, and may reveal some challenging situations that might not be listed in a formal test measure.

The analogy of the experience of stuttering with an *Iceberg* has been made before. This parallel can be used to ask the client to write down their physical experiences of stuttering, behaviors that a communication partner can observe, and those things they experience (e.g. feelings, thoughts, attitudes) that are “beneath the surface” and kept to themselves. This makes for an excellent start of a conversation about overt and covert aspects related to stuttering.

Clinician observation

As indicated earlier, self-reports are considered complimentary to the clinician's observation of a PWS's disfluencies, their use of behaviors that are secondary to the stuttering, and any other events that are overtly present. Given that the PWS does not stutter in the same way in all situations and in all modalities, it is best practice to obtain a reading sample as well as spontaneous speech samples. Even better would be to obtain speech samples not just in a clinical setting, but



in daily living environments. This might particularly be useful when the client or the parent indicates that speech being observed in the clinical setting is not representative of speech in daily life. Certainly, in cases like this, obtaining a speech sample in other environments would be crucial. As mentioned earlier, operational definition and measurement are vital in the identification of observable behaviors such as type of disfluency.

Reading Sample

In terms of differential diagnosis, and to define whether the client's stuttering is more affected by sound/word or situational variables, it is important to investigate several components related to reading and extemporaneous speech. One such element is the assessment of the extent to which the client *anticipates* where they will stutter, which can typically not be gauged before at least age ten. This can be accomplished by having the client read a text silently and underline the words on which they *expect* difficulty if they were reading the text aloud at that moment. The *consistency* of anticipation can also be assessed by having the client do this task twice. This task is, of course, then immediately followed by oral reading. A 300-word text is typically used for an adult and a 200-word text for school-age children that is well below their reading level, so as not to run into technical reading issues. Afterwards, the clinician determines the consistency between anticipated and actual stuttering, which is typically higher for more sound/word-specific versus situation-specific stuttering. This agreement is essentially absent in the neurogenic dysfluent person and the person who clutters.

Two successive *oral readings* of the same text serves to not only investigate types, frequency, and locus of dysfluency, but also consistency and adaptation. Indeed, if stuttering is rather *consistent* (occurring on a given reading trial, while also occurring on the immediately preceding trial), this might be another indication pointing to stuttering being more sound/word- rather than situation-based. The presence or absence of *adaptation* (a decrease in stuttering in repeated readings of the same material) can also serve in differential diagnosis.

Type and *frequency* of dysfluency are crucial in terms of determining whether a client's speech has the characteristics of a PWS or is more likely of a different nature. Most researchers and clinicians agree that part-word (sound or syllable) and mono-syllabic word repetitions, oral and silent (block) sound prolongations, and broken words are considered stuttering behaviors. Determination in terms of stuttering is also helped by observing the dysfluencies in a molecular, detailed, topographical way: aspects include whether the dysfluency is accompanied by tension, how fast the repetition is produced, the number of reiterations, the duration

of the prolongation etc. Interjections, phrase and multi-syllabic word repetitions, incomplete phrases, and revisions are considered typical disfluencies, which may be used as coping devices. E.g. a client might interject a particular word or sound, or repeat a phrase, prior to a word on which they expect to stutter. The use of these “normal” disfluencies needs to be scrutinized to detect whether a pattern can be discerned regarding their use. However, the presence of uniquely typical disfluencies in the absence of stuttering can indicate a fluency disorder which is not stuttering, as is the case in pure cluttering or certain pathologies that have dysfluency as a comorbidity, like Tourette syndrome (Van Borsel et al., 2004). The *locus* of stuttering in the word and the type of *phonemes* that elicit stuttering also provide useful information. PWS typically stutter on initial sounds in a word, which might be different in dysfluencies that are of a different nature (neurogenic dysfluency or co-morbid dysfluencies). The type of phoneme, in terms of articulation, place and manner, provides useful information regarding fluency-enhancing strategies that might be employed in treatment.

In summary, the absolute number and percentage of words or syllables stuttered, the types of stuttering behaviors and other disfluencies, the significant phonemes and their locus, the number of re-iterations in repetitions, the duration of prolongations, and the presence of anticipation, consistency and adaptation all assist in fine-tuning the observation of the clinician.

Spontaneous Speech Sample

Collecting *extemporaneous speech* samples during *monologue* and *conversation* are also essential elements in a fluency assessment. A 300-word speech sample can be obtained for this purpose, while the client describes age-appropriate situational images and engages in a conversation. Similar to the reading sample, the type and frequency of stuttering behaviors and other disfluencies are noted, as is the consistency relative to particular problematic sounds/words, the locus of stuttering, and the use of concomitant behaviors. In addition, the determination of *speech rate* will provide a direct link to potentially useful treatment strategies.

Comparing fluency during reading and extemporaneous speech will shed light on whether the client is predominantly a word- or situation-specific PWS. This is specifically seen in the differential frequency of stuttering in each of these conditions. Various observed factors can indicate that a person’s stuttering might be predominantly word-specific. These include: more stuttering occurring during reading than during extemporaneous speech; a relatively high consistency of the loci of stuttering; a relatively high agreement between the frequency of *expected* and *observed* stuttering; and limited adaptation. If the opposite were observed, the person’s stut-



tering could be of a more situational nature, although typically a combination of both is found to exist, with an emphasis on sounds/words or situations.

For preschool children, consistency of the locus of stuttering can be measured by having the child name picture cards twice in succession (e.g. pictures within an articulation test), and/or by having the child repeat a series of age-appropriate sentences twice.

The above information on reading and extemporaneous speech can be obtained through informal reading, and speech sample collection and analysis. Also, the *Stuttering Severity Instrument (SSI-4)* (Riley, 2009) can be used to assist in determining the frequency of stuttering during a reading and speech task, and the duration of the three longest stuttering events. As it relates to the use of coping behaviors, a few concomitant behaviors are also listed, and can be scored by the clinician on a 6-point rating scale. This instrument provides normative data and has good psychometric properties.

Probing whether masking and/or choral reading have a positive effect on stuttering can also assist in differential diagnosis, because these techniques typically have no effect on the speech of individuals whose disfluency is of a non-stuttering nature (e.g. neurogenic dysfluency). The benefit of using masking and choral reading at the end of the initial assessment also demonstrates to the client, if their speech immediately improves, that their speech mechanism is *capable* of producing more fluent speech.

From Evidence-Based Assessment to Evidence-Based Treatment

As stated earlier, in the author's opinion, a multi-faceted assessment should form the basis for a sound differential diagnosis, and give direction to treatment. A multi-dimensional assessment embraces the inter-relationship between negative emotion, speech disruption, speech-associated mal-attitude, and avoidance and escape behaviors. The evidence-based test procedures should provide the therapist with specific self-report data about disfluency, sounds/words/situations that are problematic for the PWS, avoidance and escape behaviors that are used to cope with the stuttering, and the antecedents and consequences of the behavioral events in terms of negative emotion and mal-attitude.

It is essential that the assessment data provide the clinician with an initial road map to therapy that is client-specific, tailored to their needs, and multi-dimensional in nature. As meta-analysis data have shown (Herder et al., 2006; Nye et al., 2013), no one therapy procedure or set of procedures can help everyone. In addition, the magnitude of treatment effects differs among clients, and strategies are not mutu-

ally exclusive, but have an interactive and cumulative effect. The strategies' effectiveness also depends on various factors, which include: the treatment tactics that relate to stuttering or coping behaviors; the severity and complexity of the behavioral display; the longevity of the disorder; the existence of realistic expectations; the anticipated improvement; the commitment of the client; and whether practice is massed or distributed; among others.

Multiple Choice Questions

1. The World Health Organization's (WHO) *International Classification of Functioning, Disability and Health* (ICF) taxonomy:
 - a) suggests that the environment plays an important role in a disorder such as stuttering
 - b) only considers "nature" and not "nurture"
 - c) states that anatomical and body functioning components need to be considered in a disease or disorder
 - d) both a and c
2. As it relates to 'state' and 'trait' tests:
 - a) 'state' only relates to anxiety
 - b) 'state' relates to a particular situation
 - c) 'trait' relates to a temporary event
 - d) there is no difference in what they investigate
3. The *Behavior Assessment Battery* (BAB):
 - a) consists of five different sub-tests
 - b) only exists for adults
 - c) investigates the Affective, Behavioral and Cognitive dimensions related to stuttering
 - d) is a severity inventory
4. Which of the following statements is correct?
 - a) In assessment, it is sufficient to only obtain a reading or spontaneous speech sample
 - b) An operational definition of stuttering is not necessary, because everyone uses the same taxonomy
 - c) Information about which phonemes are mostly stuttered on is not useful
 - d) Both reading and spontaneous speech samples should be collected
5. During reading assessment, the following can be investigated:
 - a) Type and frequency of dysfluency
 - b) Adaptation



- c) Anticipation
- d) Consistency
- e) All of the above

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