

# Behavior Assessment Battery: A Pilot Study of the Affective, Behavioral, and Cognitive Correlates Surrounding Spasmodic Dysphonia

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**Summary: Objective/Hypothesis.** This study investigates if adults with adductor spasmodic dysphonia (ADSD) report to experience anxiety and voice problems in particular situations, indicate the presence of negative speech-associated attitude, and/or the use of coping behaviors, by means of the Behavior Assessment Battery (BAB) modified for voice.

**Methods.** Thirty-two participants with ADSD and 32 adults without a voice disorder participated in this study. Each person completed four different BAB-Voice subtests. These standardized self-report tests are adaptations of the original BAB for people who stutter and explore an individual's speech-related belief, negative emotional reaction to and speech problems in particular speech situations, and the use of concomitant behaviors.

**Results.** Individuals with spasmodic dysphonia (SD) scored statistically significantly higher compared to typical speakers on all BAB subtests, indicating that individuals with SD report being significantly more anxious and experiencing significantly more voice problems in particular speech circumstances. They also reported a significant amount of negative speech-associated attitude and the use of a significant number of coping behaviors. Internal reliability was good for three of the four BAB subtests.

**Conclusions.** The BAB is capable of reflecting the dimensions that surround the disorder of SD. The self-report measures have the potential to augment the observations made by the clinician and may lead to a more diverse and all-encompassing therapy for the person suffering from SD. Future research with a revised version of the BAB-Voice will continue to explore the validity, reliability, and replicability of the initial data.

**Key Words:** Adductor spasmodic dysphonia–Voice disorder assessment–Behavior Assessment Battery.

## INTRODUCTION

Spasmodic dysphonia (SD) is a complex neuromotor disorder characterized by involuntary spasms of the laryngeal muscles during speaking.<sup>1</sup> Historically, the diagnostic label of SD has varied with multiple etiologies, ranging from neurologic to psychiatric, considered as causative.<sup>1–4</sup> Current evidence supports a neurogenic etiology and classifies SD as a task-specific focal dystonia. Although no clear relationship exists between SD and damage to any one particular area of the brain or brain stem, recent studies have demonstrated a relationship with areas in the basal ganglia, thalamus, sensorimotor cortex, and cerebellum.<sup>5–16</sup>

Although the etiology of SD is unclear, onset typically occurs during the fourth decade of life<sup>17</sup> and is more prevalent in women (nearly 80%) than in men.<sup>18</sup> The National Spasmodic Dysphonia Association estimates that 50 000 people in North America are affected by SD.

The disorder can present in a variety of forms (adductor, abductor, mixed, or tremor), each of which is characterized by distinct vocal symptoms. Of these, adductor SD (ADSD) is the most common form of SD and is characterized by irregular and uncontrollable tight or strained-strangled voice stoppages or

breaks, which are caused by intermittent and irregular closure (adduction) of the vocal folds during phonation.<sup>1,19</sup>

Individuals with ADSD frequently demonstrate symptoms also commonly associated with stuttering. Chief among these is “speech interruption,” characteristic fluency breaks due to irregular muscular spasms. As with stuttering, individuals with ADSD also demonstrate increased effort during speech tasks, particularly when attempting to push through a spasm, and laryngeal involvement is evidenced during these interruptions in the forward flow of speech.<sup>19–24</sup>

In the field of fluency disorders, more specifically stuttering, several researchers have indicated that, what encompasses a person who stutters, includes more than just a speech impediment.<sup>25–32</sup> There is abundant evidence that, what impacts people who stutter (PWS) goes far beyond an interruption of the forward flow of speech and the dysfluencies that they exhibit. In addition to the stuttering behaviors that are obvious, PWS might use an array of behaviors that are secondary to the stuttering.<sup>25–27,33–35</sup> These behaviors are used to cope with the fluency failures that PWS experience. In addition, most PWS think negatively about their speech and way of speaking,<sup>26,33,36–44</sup> and many of them face anxiety and experience speech disruption that is linked to particular sounds, words, and/or speech situations.<sup>26,44–53</sup>

Self-report measures are a valuable means of investigating the affective, behavioral, cognitive, physical, and social dimensions that characterize stuttering. These self-report measures provide the clinician with a multidimensional “inside” view<sup>26</sup> of the speech and speech-related difficulties experienced by an individual before and during treatment. These reflective self-report measures provide a glimpse of symptoms “through

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the eyes of the client”<sup>26</sup> and complement both the qualitative and quantitative external observations made by the clinician. Self-report measures also enable the clinician to direct attention to relevant negative emotional, speech disruptive, secondary adjustive, and attitudinal elements of the presenting complaint.

The Behavior Assessment Battery (BAB) is a standardized instrument that assesses the dimensions that surround stuttering.<sup>25–27</sup> The BAB includes a series of tests that measure the affective (A), behavioral (B), and cognitive (C) facets of stuttering, considered collectively as the “ABC” components. The reliability and validity of the BAB and its separate subtests have been reported on in repeated cross-cultural investigations.<sup>26,32,35,45,46,49,50</sup> One of these BAB subtests, the Speech Situation Checklist (SSC), provides a means of evaluating a client’s reported emotional reactions and dysfluency throughout a range of different speech situations; the Behavior Checklist (BCL) serves to inventory the number, type and frequency of avoidance, and escape responses secondary to the anticipation or the presence of speech difficulty; and the Communication Attitude Test for Adults (BigCAT) is a communication attitude scale assessing speech-associated beliefs. Taken together, these instruments provide the clinician with stable and true measures of phenomena that are relevant to everyday clinical practice.

As has been the case within the health care field in general, the subspecialty of voice disorders has increasingly acknowledged the psychosocial effects of impairment, in this case, the impact of a voice disorder such as SD, on day-to-day life.<sup>54–61</sup> The current approaches emphasize the meaning of an impairment or disability from the *patient’s unique perspective*, so that effective treatment planning and implementation of interventions have the potential to produce the greatest benefit for each individual.<sup>62</sup> In this vein, the Voice Handicap Index (VHI),<sup>63–65</sup> the Voice-Related Quality of Life questionnaire (V-RQOL),<sup>66–68</sup> and the Voice Disability Coping Questionnaire<sup>69</sup> are widely reported means of measuring the psychosocial impact of voice disorders such as SD. An additional questionnaire, the Voice Activity and Participation Profile (VAPP),<sup>59</sup> evaluates an individual’s perception of a voice problem, activity limitation, and restrictions in participation, using the World Health Organization’s International Classification of Impairments, Disabilities, and Handicaps model.<sup>70</sup> The psychosocial impact of SD can also be quantified through the use of more general health-related questionnaires<sup>1,64,71,72</sup> that, although not specifically focusing on SD, measure the use of coping behaviors in social and occupational settings. Recent qualitative findings by Baylor and colleagues<sup>62</sup> reveal that individuals with SD frequently report a dissociation between the sound of their voices and feelings, personality, or capabilities. Collectively, this work has advanced and broadened our understanding of the physical, functional, and psychosocial consequences of SD. However, much is unknown about the situational difficulties and the coping strategies used by individuals with SD. Obtaining an “inside view” from these patients can be challenging because of the multitude of variables which shape each individual’s experience.<sup>62</sup> Although anecdotal reports within the scientific

literature suggest that symptoms of SD interfere with family, social, and occupational engagement, the specific environments, the coping mechanisms, the emotional reaction, the speech-related belief system, and personal factors that shape these effects require further evaluation.<sup>62</sup> Whereas the VHI, V-RQOL, and VAPP have shed light on the variables surrounding voice disorders in general, the aforementioned elements have not been captured previously in research that specifically focused on individuals with ASD. The current investigation involving the BAB will allow for the assessment of the particular domains that are disorder-specific.

This investigation involved a novel application of an adapted version of the BAB for PWS to adults with ASD to determine the extent to which adults with SD score differently on the BAB subtests compared with typical speakers, and whether gender had an impact on the scores. Also, the possible relationship between the affective, behavioral, and cognitive components related to SD was examined. In addition, within- and between-group item analyses were performed to determine each test’s internal reliability and the extent to which each test item contributes to differentiating individuals with SD from typical speakers. On the basis of this analysis, certain items might, in future research, need to be eliminated from the original item pool.

## METHODOLOGY

### Participants

Thirty-two adults with ASD and 32 adults without a voice disorder, between the ages of 31 and 86 years participated in this research study. The mean age for the experimental group was 61.60 years (standard deviation, 13.30) and 58.70 years (standard deviation, 12.60) for the control group. All individuals in the experimental group were diagnosed with ASD. The diagnosis of ASD was made by a voice care team consisting of an otolaryngologist and a speech-language pathologist practicing in the greater Orlando area, with a >25-year history of evaluating and treating patients with SD. All SD participants were recruited from this center. The voice care team differentiated ASD from muscle tension dysphonia by means of endoscopic, acoustic, and perceptual evaluation tools. Endoscopic criteria included the presence of two or more inappropriate adductor spasms during sustained vowel phonation and during the reading of a connected speech narrative. Criteria for the acoustic analysis included two or more phonation breaks, frequency shifts, or evidence of aperiodicity. Individuals demonstrating symptoms of concomitant vocal tremor were excluded from this study. The group of participants with SD consisted of six men and 26 women, which is representative of the gender ratio among the population of people with SD. All SD participants were either 6 months after the injection of botulinum toxin or had never received an injection, and did not receive any other form of treatment.

The sample of individuals without voice disorders was recruited through businesses, professional and private clubs and organizations, religious groups, and so forth, via word of mouth. Participants in this group were more equally divided among men and women (15 and 17, respectively) to represent the general population. The sample of typical speakers was

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