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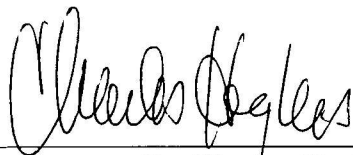
Identifying Speech-Language Pathologists' Current Perceptions and Practice Patterns

Related to Neurogenic and Psychogenic Stuttering

By

Mary M. Griffith

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Identifying Speech-Language Pathologists' Current Perceptions and Practice Patterns

Related to Neurogenic and Psychogenic Stuttering

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2013

Submitted to the Faculty of the Graduate School of  
Eastern Kentucky University  
in partial fulfillment of the requirements  
for the degree of  
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## DEDICATION

This thesis is dedicated to my family who has always been there for me even when we were physically apart. I dedicate this research to my brother, Ian, who greatly benefited from the field of Speech-Language Pathology.

## ACKNOWLEDGMENTS

I would like to thank my major professor, Dr. Charles Hughes, for his guidance, patience, and expertise in the field of Fluency Disorders. I would also like to thank the other committee members, Dr. Kellie Ellis and Dr. Sue Mahanna-Boden, for their critical eyes and constant assistance throughout my graduate thesis process.

## ABSTRACT

A web-based survey was collected and analyzed from 39 speech-language pathologists (SLP) contacted through the American Speech-Language-Hearing Association's (ASHA) Special Interest Groups #2 and #4 as well as members of the American Board of Fluency and Fluency Disorders (ABFFD) via email regarding their current perceptions and clinical practice patterns with individuals with neurogenic and psychogenic stuttering. Participants reported using a battery of assessments and a variety of treatment approaches to diagnose neurogenic and psychogenic stuttering in addition to traditional fluency assessments and fluency enhancing techniques. Participants rated themselves as having more knowledge and experience with neurogenic stuttering than psychogenic stuttering. Results of the study revealed that some, but not all SLPs are collaborating with other health professionals in regards to providing clinical services to individuals with neurogenic or psychogenic stuttering.



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## **Chapter I**

### **Introduction**

Acquired stuttering is considered a rare phenomenon in the field of fluency disorders (Guitar, 2014). Guitar (2014) defines one of the most common types of acquired stuttering, neurogenic stuttering, as appearing after or having been caused by neurological disease or damage such as stroke, traumatic brain injury (TBI), Parkinson's Disease, drug toxicity, or post-traumatic stress disorder (PTSD). Another common type of acquired stuttering is psychogenic stuttering, which Guitar (2014) defines as stuttering caused by a period of prolonged stress or occurring after a traumatic event.

When compared to the research available for these two types of acquired stuttering, research studies on developmental stuttering predominate the literature available to speech-language pathologists (SLPs) treating fluency disorders (Ringo & Dietrich, 1995). Thus, it is difficult to provide conclusive data from the limited research available regarding the specific characteristics of two major types of acquired stuttering: neurogenic and psychogenic stuttering (Ringo & Dietrich, 1995). This limitation is even more obvious in reviewing the research of other types of acquired stuttering, such as malingering, pharmacogenic stuttering, and stuttering resulting from a traumatic brain injury in military combat. Dominated by single case studies, researchers strive to identify typical characteristics and evidence-based intervention protocols for acquired stuttering. This a daunting task for researchers, resulting in most studies of neurogenic and psychogenic stuttering having small population samples and, often, inconclusive data, leaving practicing SLPs with more questions than answers. Ringo and Dietrich (1995)

reported that speech-language pathology still lacks sufficient data on the specific characteristics of acquired stuttering in comparison to the large amount of research we have available on developmental stuttering. Ringo and Dietrich (1995) encourage SLPs to collect data on this rare population so that others can better understand acquired stuttering and its many different types, such as neurogenic and psychogenic stuttering.

This study aims to explore SLPs' current perceptions and clinical practice patterns with individuals with neurogenic and psychogenic stuttering. This research study collected its data from SLPs currently in the field who have experience working with clients with neurogenic and psychogenic stuttering. The data collected will provide an overview of SLPs and how they perceive their own knowledge and experience with this disorder, the assessment protocols they use, the treatment strategies they have found most beneficial, and whether they collaborate with other health professionals when confronted with neurogenic or psychogenic stuttering. This information will serve as a summary of current clinical practice with neurogenic and psychogenic stuttering today compared to the data reported in research literature available to SLPs.

## **Chapter II**

### **Review of Literature**

This review of literature will include research regarding several types of acquired stuttering, but the current study will focus on two types of more commonly reported acquired stuttering disorders: neurogenic and psychogenic stuttering. First, studies on neurogenic stuttering, including those that focused on speech characteristics, neural etiology, assessment, and treatment approaches will be reviewed. Second, studies on psychogenic stuttering, including those that provide common speech characteristics, co-occurring disorders, assessment strategies, and treatment approaches, will be reviewed. Last, this review will briefly define other types of acquired stuttering, which are less frequently reported in the research available.

#### **Neurogenic Stuttering**

Neurogenic stuttering is a speech disorder that is most often acquired in adulthood as a result of stroke, traumatic brain injury, or neurodegenerative disease (Jokel, De Nil, & Sharpe, 2007; Theys, van Wieringen, Sunaert, Thijs, & De Nil, 2011). Some literature has reported that neurogenic stuttering has often been considered a rare phenomenon (Theys et al., 2011). However, Market, Montague, Buffalo, and Drummond (1990) reported that 100 out of the 150 SLPs surveyed identified at least one client with neurogenic stuttering in their caseload. Similarly, Lundgren, Helm-Estabrooks, and Klein (2009) stated that there are still questions related to neurogenic stuttering being a communication disorder. Lundgren et al. (2009) suggest that neurogenic stuttering may

be mistaken for symptoms of other motor speech disorders such as apraxia, which can appear after a stroke.

### **Literature Identifying Clinical Characteristics of Neurogenic Stuttering**

The literature recognizes six differential clinical characteristics of neurogenic stuttering (Helm-Estabrooks, 1999; Jokel et al., 2007; Tani & Sakai, 2010; Theys, van Wieringen, & De Nil, 2007; & Lundgren, Helm-Estabrooks, & Klein, 2009) which include: (1) disfluencies occur on function and content words; (2) annoyance, but no anxiety is present in regards to speaking; (3) disfluencies consisting of repetitions, prolongations, and blocks can occur at any position of the word or utterance; (4) secondary symptoms (i.e., facial grimacing, eye blinking, or fist clenching) do not occur during moments of disfluency, (5) there is no adaptation effect, meaning the speaker will not become more fluent with multiple readings of the same passage, and (6) stuttering occurs consistently across various types of speaking settings and environments.

Similarly, Manning (2010) provided five clinical characteristics, which may occur in clients with neurogenic stuttering. These characteristics are in support of those previously observed by Helm-Estabrooks (1999). Manning's (2010) characteristics include: (1) no history of previous fluency problems, (2) sudden or progressive degrading of the client's central nervous system either by disease, illness, or aging, (3) fluency does not improve during fluency-enhancing conditions (i.e., choral reading, pausing, singing, etc.), (4) fluency does not improve during automatic speech tasks—like saying the pledge of allegiance, ABC's, or days of the week, (5) disfluencies can occur on medial and final syllables of words. Bloodstein (1987) generalizes that in most cases of neurogenic

stuttering, typical disfluency patterns include repetitions or prolongations of initial sounds, syllables, or words without observable strain nor secondary symptoms or anxiety. However, Bloodstein admits that exceptions to this list of typical characteristics exist among other published research. For example, Koller (1983) and Rosenbek, Messert, Collins, & Wertz (1978) describe secondary and compensatory behaviors as accompanying acquired stuttering in adults. In contrast, Helm-Estabrooks (1999) found that in adults with acquired stuttering there existed no secondary behaviors and was one of the diagnostic criteria she identified as an aid to speech-language pathologists (SLP) in differentiating acquired stuttering from developmental stuttering.

Another characteristic of neurogenic stuttering reported is that it has a low consistency effect (Yairi & Seery, 2011). A low consistency effect means that there is a reduced predictability by the speaker and listener of when disfluency will occur in speech. Yairi and Seery (2011) point out that this low consistency effect supports the idea that neurogenic stuttering can be regarded as its own type of acquired stuttering disorder.

Practicing SLPs lack agreement in the defining speech characteristics of neurogenic stuttering, which is apparent in the findings of Van Borsel and Taillieu (2001). Van Boursel and Taillieu (2001) found that SLPs misidentified neurogenic stuttering as developmental stuttering just as often as they correctly identified developmental stuttering. This study further supports the argument that more research, education, and assessments need to be developed to help SLPs identify neurogenic



stuttering. It is clear from this experiment that diagnostic assessments for neurogenic stuttering need to go beyond just simply analyzing a client's speech sample.

These characteristics of “typical” speech in people with neurogenic stuttering should not be a SLP's sole criteria for assessing a client. For example, Horner and Massey (1983) documented this testimony from a 62-year-old male client's reaction to the sudden appearance of stuttering following right brain damage after a stroke: *'I-I-I just can't seem to get the words out sometimes. They can't understand me, they can't understand me. I have to repe—repeat it, repeat it for 'em.'*” (Horner & Massey, 1983, p. 71-85). Many SLPs may realize that not much can be inferred about neurogenic stuttering from just looking for Helm-Estabrooks' (1999), Manning's (2010) and Bloodstein's (1987) differentiating characteristics in this speech sample. However, the majority of research and information SLPs have access to regarding neurogenic stuttering are numerous individual client case studies which include speech samples similar to the one just mentioned. These case studies, however helpful to document the speech characteristics of neurogenic stuttering, still lack precise quantitative data on the incidence of this communication disorder (Ward, 2009). Furthermore, Ward (2009) argued that these case studies might lead SLPs to believe that the atypical behaviors described in an interview of one individual can be generalized to the whole population of people with neurogenic stuttering.

Helm-Estabrooks' (1999) six behavioral characteristics and Manning's (2010) five clinical characteristics may not be enough to offer a differential diagnosis and treatment for SLPs who may encounter neurogenic stuttering. Future research is needed

to consider identifying information about neural damage or the etiology of neurogenic stuttering to supplement SLPs in differentiating it from other communication disorders (Ward, 2009).

### **Literature Identifying Neurological Etiology of Neurogenic Stuttering**

Theys, van Wieringen, and De Nil (2007) explored neurogenic stuttering related to its connection with certain lesion sites in the brain. These researchers' goal was to aid in diagnosing neurogenic stuttering by providing a defined neural based etiology in the brain from which to confirm the presence of this disorder. For example, Theys et al. (2007) examined 58 adult clients, ranging between 26 and 85 years of age, who were referred by their SLP to participate in the study. Participants were selected from SLP's client caseloads based on whether or not SLPs would describe their client's disorder as an acquired stuttering disorder marked by a high occurrence of stuttering-like disfluencies (i.e., repetitions, prolongations, and blocks). These SLPs were asked to identify if their client experienced this sudden onset of stuttering within a month of a stroke, TBI, or diagnosis of a neurodegenerative disease. Out of the 58 clients selected for participation in the study, 29 reported to have the appearance of neurogenic stuttering a month after a stroke. At the same time, 17 of these 29 clients reported to have had lesions in the left hemisphere, which caused their stroke. Four out of the 11 clients who suffered from TBI before the onset of their neurogenic stuttering were identified to have bilateral lesions. Similarly, another four of the 11 clients with history of TBI had unilateral lesions in the left hemisphere, while only one reported having a unilateral lesion in the right hemisphere. Additionally, six out of nine clients reporting to have a neurodegenerative

disease prior to the onset of neurogenic stuttering had bilateral cortical lesions and/or subcortical atrophy. The other three clients did not report a lesion location.

Theys, van Wieringen, and De Nil (2007) concluded that neurogenic stuttering might appear secondary to lesions in several different areas of the brain. Neurogenic stuttering was found to be linked to specific brain lesions in several different areas of the brain such as the frontal, parietal, temporal, and occipital lobes, as well as the basal ganglia, pons, and corpus callosum. In addition, these authors indicated that the appearance of neurogenic stuttering might depend on the specific etiology (i.e., stroke, TBI, or neurodegenerative disease). Despite the fact that Theys et al. (2007) study does not offer any clear-cut diagnostic evidence to support the idea that neurogenic stuttering may only result from certain localized lesions in the brain, the study did reveal more information on its incidence and prevalence in adult populations. More specifically, Theys et al. (2007) found that neurogenic stuttering appeared more frequently in clients after a stroke and when the lesion was located in the left hemisphere of the brain.

Ludlow and Loucks (2003) examined neural damage to specific structures of the left hemisphere that resulted in the sudden onset of neurogenic stuttering. They concluded that lesions associated with neurogenic stuttering, “...rarely involve the primary speech and language regions of the left hemisphere (i.e., Broca’s area, the temporal planum, insula, or Wernicke’s area)” (Ludlow & Loucks, 2003, p. 280). Rather, damage to these areas results in aphasia rather than neurogenic stuttering—admittedly, aphasia symptoms could mask neurogenic stuttering symptoms if both are present. Ludlow and Loucks (2003) identified lesions to structures such as the basal ganglia,

corpus callosum, and thalamus as being the cause of neurogenic stuttering. The researchers hypothesized that this is due to the fact that damage to these areas impedes rapid communication of these speech and language areas between other brain regions during speech production that could result in a motor disorder. However, researchers struggle with confirming whether neurogenic stuttering is considered a motor speech disorder similar to tremor, dystonia, spasmodic dysphonia, or dysarthria. SLPs may infer from this information that neurogenic stuttering may occur along with other motor speech disorders. Neural damage to the primary speech and language regions as well as other inter-related structures of the brain involved in rapid communication such as the basal ganglia may account for this co-occurrence. At the same time, if there is only damage to inter-related structures such as the basal ganglia, corpus callosum, and thalamus, then neurogenic stuttering may also appear on its own (Ludlow & Loucks, 2003). They conclude that stuttering is a neurodevelopmental motor control disorder that has similar clinical speech characteristics to other motor disorders previously mentioned, but the neural etiology is yet to be determined making it difficult for SLPs to differentiate between other motor disorders versus neurogenic stuttering. More investigation into the etiology of neurogenic stuttering and whether its occurrence can be attributed to interruptions in the dynamic communication between language areas and the rest of the brain rather than direct damage to those language areas is needed to aid SLPs in making reliable diagnosis.

Tani and Sakai (2010) sought to analyze the sudden onset of neurogenic stuttering, without co-occurring aphasia, in adults with lesions only in the basal ganglia.

This lesion-specific study had never been conducted before in the research of neurogenic stuttering previously. The results of their study of nine adults with sudden onset of stuttering and no aphasia concluded that lesions in the basal ganglia alone showed different characteristics of neurogenic stuttering than those identified by Helm-Estabrooks (1999). They found that blocks were the most frequently observed characteristic followed by syllable and part-word repetitions, high positive adaptation effects were observed in successive reading of a passage, the majority of disfluencies occurred on the initial sounds in words, and stuttering moments were transient and often setting and task specific. They concluded that these speech characteristics may be different than Helm-Estabrooks' (1999) clinical characteristics because the population they sampled has basal ganglia involvement and no other research study had included participants with basal ganglia involvement. Therefore, these different clinical characteristics observed must be specific to a basal ganglia lesion site. This study encourages SLPs to look further into specific lesion sites in their individual clients as it may reveal more information on lesion-specific disfluencies associated with neurogenic stuttering.

However, Tani and Sakai (2010) admitted that their study had some limitations, which may have accounted for the different characteristics of neurogenic stuttering found in their data. Tani and Sakai (2010) indicated that these limitations include the lack of reported medical background information about the cause of each participant's stuttering as well as the specific age of adult onset. The researchers encouraged future researchers

to consider such variables when trying to unravel the complexities of the brain and its connection with neurogenic stuttering (Tani & Sakai, 2010).

Conclusions regarding the neural bases of neurogenic stuttering are not for certain. Manning (2010) also suggests the existence of compounding factors such as other linguistic, cognitive, and motor disorders as well as the possible transient nature of neurogenic stuttering may have affected the ability of many researchers to identify its etiology related to its clinical characteristics.

Due to the unconfirmed neural etiology of neurogenic stuttering, Helm-Estabrooks (1999) and De Nil, Jokel, and Rochon (2007) suggest that practicing SLPs use the Aphasia Diagnostic Profiles (Helm-Estabrooks, 1992) as part of a diagnostic assessment battery aimed at confirming or denying the presence of aphasia, dysarthria, motor disorders, and cognitive disorders. Even if the presence of one or more of these disorders may exist in an individual in addition to neurogenic stuttering, it is more important to identify deficits and use that data from the assessment battery to guide an SLP in treatment planning rather than spending time searching for any one diagnosis (De Nil et al., 2007).

### **Literature on Behavioral Treatment Approaches to Neurogenic Stuttering**

Helm-Estabrooks (1999) suggests using a pacing board (used to slow a speaker's speech as they move from word to word by moving their finger from space to space on a board) and delayed auditory feedback (a device in which a speaker can speak into a microphone and hear their speech back through headphones a fraction of a second later or

longer if need be). Market, Montague, Buffalo, & Drummond (1990) surveyed SLPs who had experience working with clients with acquired neurogenic stuttering and reported significant success with using fluency-shaping strategies such as easy onsets and slow rate of speech. This same study reported that SLPs had moderate success with stuttering modification techniques such as light contacts, preparatory sets, cancellations, and pull-outs. Guitar (2014) states that treatment for neurogenic stuttering lacks conclusive data on the long-term effects of these behavioral treatment approaches. Guitar (2014) attributes this lack of information and research to the varied etiology and rare occurrence of this disorder in the current clinical populations.

Koenig (2009) agreed with this problem statement and noted that previous studies related to neurogenic and psychogenic stuttering offered only small sample populations. In addition, Koenig (2009) reports that existing studies on acquired stuttering lack objectivity, comparability of data, and often include an inaccurate sample procedure. Therefore, she conducted a similar survey of SLPs in regards to neurogenic stuttering in Germany over a period of 4 years (2004-2008). Her study asked questions about how SLPs are treating neurogenic stuttering in Germany, whether neurogenic stuttering treatable and what treatment techniques SLPs are using, as well as which factors offer a good prognosis for therapy.

### **Psychogenic Stuttering**

Psychogenic stuttering is another type of acquired stuttering that has a similar late-onset in adolescence and adulthood. Literature related to psychogenic stuttering attributes the cause to acute or chronic periods of psychological stress, or a single

traumatic, psychological event in individuals with no prior history of developmental stuttering (Helm-Estabrooks, & Holtz, 1998; Roth, Aronson, & Davis, 1989).

### **Literature Identifying Clinical Characteristics of Psychogenic Stuttering**

Manning (2010) compiled a list of clinical characteristics, which may occur in individuals with psychogenic stuttering. He makes clear that a case history of a diagnosed psychopathology can be a strong indication of psychogenic stuttering, but it is not always necessary or previously known to the individual or the SLP. Manning (2010) reports that the speaker is observed to continue to stutter during the use of fluency-enhancing techniques or may exhibit increased disfluency during these fluency-enhancing speaking tasks (i.e., successive readings of the same passage). In addition, the individual may exhibit unusual secondary behaviors and signs of anxiety, which do not occur during moments of disfluency and are seemingly unrelated to his or her stuttering moments. In some cases stuttering may subside after a patient interview when upon the disclosure of a traumatic event that carried a lot of emotional stressors for the individual can alleviate stuttering symptoms all together. He notes that often times, the individual will show rapid success with a brief period of trial therapy. The individual may also use unusual syntax and grammar when speaking. SLPs may also observe other fluency interruptions such as multiple phoneme repetition with co-occurring head movements, facial grimaces, and tremor-like movements. Lastly, Manning (2010) identifies patterns of disfluency that are related to a specific environmental setting or speaking situation in individuals with psychogenic stuttering.



Deal (1982) noted in his single case study of a 28-year old male, military veteran with psychogenic stuttering, that this individual's stuttering remained consistent during singing, choral reading, delayed auditory feedback, masking noise, miming, and automatic or overlearned phrases. Deal (1982) observed that his stuttering disfluencies were marked by repetitions of syllables or sounds, usually on the initial syllable and on stressed syllables of multi-syllabic words, prolongations on articles (i.e., "I", "a", or "he"), and he demonstrated no hesitations or blocks before speaking and no word avoidance behaviors were observed as compensatory strategies.

It is important to note that the subject of Deal's (1982) case study was a 28-year old male Vietnam veteran who was referred to SLPs from a psychiatric hospital where he sought treatment for depression, attempted suicide, and attended a drug abuse maintenance program. The case study has a variety of precipitating psychopathological factors—particularly the patient's history of drug abuse and previous admissions to the psychiatric hospital—which may have contributed the appearance of acquired stuttering in this particular patient. Not to mention, the patient reported a history of a previous sudden-onset of stuttering when he was 16 years old after having attempted suicide. A psychiatric referral sparked a second suspicion of malingering in that the patient was observed by staff to speak fluently with other patients at the hospital, but non-fluently to staff, which are marked behaviors of a possible case of malingering.

This patient's case history alone would make it difficult for SLPs to pinpoint the true etiology of his acquired stuttering. The patient had a history of drug abuse, which could have caused pharmacological stuttering. Malingering stuttering is also a possibility

considering staff reports of fluent communication with other patients and non-fluent communication with staff. However, Deal (1982) notes an important limitation in that there were no reports in the literature that documented an assessment protocol for SLPs in making a differential diagnosis between psychogenic or malingering of acquired stuttering.

Nevertheless, Deal (1982) leans more toward a psychogenic stuttering diagnosis for this particular case study due to a patient's case history of PTSD from his military service, which may have brought about a second episode of stuttering similar to a previous onset when he attempted suicide at 16 years old. According to psychogenic stuttering as previously defined in this paper, this patient's attempt of suicide would be considered a traumatic event causing psychological stress that may have triggered a recurrent episode of acquired stuttering. However, this conclusion is weak and unreliable in that it weighs too heavily upon reports of a patient under severe psychological stress and fails to rule out other possibilities.

Baumgartner (1999) reports that differential diagnostic markers of psychogenic stuttering and other acquired stuttering cannot be found in speech disfluency patterns alone. Most of his markers that he identifies are independent of the patient's stuttering-like disfluencies. Rather, these markers lie within the patient's reported case history, psychological status revealed in initial interviews, and a rapid, positive response to trial therapy. Guitar (2014) argues that in cases of possible psychogenic stuttering, it is necessary to take a multidisciplinary approach requiring that SLPs collaborate with

neurology, psychiatry, etc. to determine existence or absence of neurological signs or symptoms.

The diagnosis of a psychological disorder is outside of the scope of practice in speech-language pathology. However, Baumgartner (1999) states that more information regarding the role psychological disorders play in relation to the appearance of psychogenic stuttering is needed as it may aid SLPs in their work of assessment, management planning, prognosis, and provide opportunity for interdisciplinary collaboration. Baumgartner admits that such a psychological diagnosis is not always a viable option for some patients and SLPs. In the end, results of testing may not reveal anything to aid SLPs to dismiss or validate the presence of acquired psychogenic stuttering.

Psychogenic stuttering can occur in the absence of a psychological affect and along with other neurological deficits. The absence of a psychopathology diagnosis should not automatically disprove the possibility of psychogenic stuttering (Baumgartner, 1999). Generally, psychogenic stuttering can be differentiated from neurogenic stuttering in that it doesn't have a neurological etiology (i.e., stroke, neurodegenerative disease, physical trauma, tumor, or drug toxicity), but it can often co-occur with other (unrelated) neurological and psychological signs and symptoms (Roth, Aronson, & Davis, 1989). For example, Roth, Aronson, & Davis (1989) documented that 10 out of 12 patients in their sample population with suspected psychogenic acquired stuttering complained of a headache; seven out of 12 complained about a numbness, tingling, clumsiness, or weakness; four complained of tremors or seizure-like behaviors; and four complained of

memory or other disturbances in thinking. In addition, Roth, Aronson, & Davis (1989) recommended that a motor speech examination as necessary to rule out motor speech disorders like apraxia and Parkinson's disease, which may show stuttering-like disfluencies in patients with adult-onset.

Roth, Aronson, & Davis (1989) discuss how similar the characteristics of conversion reaction disorder are to acquired stuttering. Similar to acquired psychogenic stuttering, conversion reaction disorder is reported to appear most often in patients with a history of psychological stress related to a traumatic event that occurred days or weeks prior to onset of their symptoms. Similarly, the changes reported by patients with conversion reaction disorder can be compared to physical signs of neurologic disease (i.e., paralysis, sensory disturbances, seizures, incoordination, auditory and vision issues) and could manifest themselves in acquired stuttering-like disfluencies. Obviously, conversion reaction disorder can present itself in a variety of ways in any one individual, which adds to the complex job of evaluation by an SLP, further pointing to the need for collaboration with other associated disciplines.

### **Literature on Treatment Approaches for Psychogenic Stuttering**

Baumgartner (1999) offered the idea that assessment and initial interviewing, itself, can be therapeutic to patients exhibiting psychological stress or anxiety. Furthermore, he reported that some patients have even reported that their stuttering decreased after an initial evaluation and discussions about the traumatic event(s) that surrounded their onset with the SLP. Roth, Aronson, & Davis (1989) and Baumgartner (1999) also suggest that the most revealing diagnostic indicator of psychogenic stuttering

is the patient's improvement with trial speech therapy and psychological counseling or therapy.

Guitar (2014) agreed in that those clients who do not improve with speech therapy, or continue to stutter when speaking in fluency-inducing conditions, may then lead to an investigation of possible malingering stuttering. It is important to note that treatment for psychogenic stuttering documented in the literature is variable and has ranged from psychotherapy to hypno-behavioral therapy to the absence of any therapy (Deal, 1982). In some cases, a psychogenic diagnosis isn't revealed until improvement with trial therapy (Guitar, 2014).

Baumgartner (1999) insists that often times it is more important and effective to focus treatment on counseling and changing the individual's "belief system" by ensuring them that they have a good prognosis for improved fluency. He says another factor in the treatment plan should be to reduce or eliminate all together extraneous secondary movements, which are unrelated to the individual's stuttering moments. He recommends such techniques as requiring the individual to speak while lying on their back, having them squeezing a ball while speaking, or the SLP can physically manipulate the facial muscles to reduce musculoskeletal tension.

### **Other Types of Acquired Stuttering**

The literature on acquired stuttering identifies additional acquired stuttering cases aside from those cases that are purely neurogenic or psychogenic nature. These diagnoses include malingering stuttering, pharmacogenic stuttering, and stuttering as a result of

traumatic brain injury. Researchers argue that these other acquired stuttering disorders include some neurogenic or psychogenic aspects. However, for the purposes of this review each will be regarded as separate diagnostic entities within the overarching term of acquired stuttering disorders.

**Malingering Stuttering.** Malingering stuttering has sometimes been considered in situations of avoiding criminal charges as in discrediting witness identifications and can occur in relation to any other situation in which the person might gain benefits from the presence of a stutter (Silverman, 2004). These benefits could range from financial compensation in the case of an accident that may have caused a stutter to “appear”, or in order to get financial aid for health services, or special treatment at work (Silverman, 2004). Seery (2005) describes two levels of malingering: pure malingering and partial malingering. He described pure malingering as the intentional faking of all symptoms of a stuttering disorder. Partial malingering of a stutter is described as the exaggeration of existing symptoms. Partial malingering has been noted in the literature in case studies of people who have been attempting to exhibit their innocence when charged with a crime (Bloodstein, 1987).

Unfortunately there is very little research regarding established protocols for SLPs to use in order to determine whether a person is malingering a stuttering disorder (Deal, 1982; Silverman, 2004). Seery (2005) adapted an indirect assessment protocol for evaluation of stuttering behaviors in order to discredit true stuttering in a criminal’s performance on certain speaking tasks in a variety of speak conditions. A thorough examination of a criminal’s case history, and indirect tests of malingering found that the

defendants' participation in fluency-inducing tasks (automatic speech, finger tapping while talking, prolonged speech, and unison speech) revealed consistently severe stuttering during conditions that often elicit enhanced fluency in people who stutter. However, in a review by Manning (2010) he cites two cases wherein both defendants had been found not guilty to their crimes because they were found to exhibit true stuttering and stuttering was not a characteristic described by the victims and/or witnesses identifying them in court.

**Pharmacogenic Stuttering.** John Van Borsel (2011) addressed the idea of pharmacogenic stuttering as its own unique entity within the umbrella of acquired stuttering. However, Van Borsel makes note that this is a contradictory opinion in the area of stuttering research. He argues that it is a separate entity entirely because it has a different cause, diagnostic markers, and intervention than neurogenic stuttering. The cause of pharmacogenic stuttering has been linked to a symptom of drugs such as psychopharmaca, anticonvulsants, and broncho dilatator theophylline. The role of the SLP in diagnosing this fluency disorder involves an in-depth drug history that includes both past and current medications the client is taking. If the client is uncertain, common in elderly who may take many drugs, about the name of a drug or the timeline in which they began a new medication that consultation with their physician is critical. Similarly, if pharmacogenic stuttering is a suspected diagnosis, SLPs must consult with the physician before changing a client's medication, varying the dosage, or replacing the drug with another one, as this is not within a SLPs scope of practice. Van Borsel notes that symptoms of drugs may vary across individuals in that no drug affects each person

the same way. However, most cases of pharmacogenic stuttering can be identified by the same primary speech patterns as any other stuttering disorder, mainly repetitions, blocks, and prolongations (Van Borsel, 2011).

**Stuttering as a Result of Traumatic Brain Injury in the Military.** Guitar (2014) reported stuttering occurring, specifically, in veterans of wars as a result of stress in combat. Roth, Manning, and Duffy (2012) shed light on this not uncommon occurrence in military personnel who have a traumatic brain injury and/or posttraumatic stress disorder (PTSD). Similarly, the situation of sudden-onset acquired stuttering in these individuals faces similar differential diagnosis and treatment issues, as do neurogenic, psychogenic, and other acquired fluency disorders. Roth, Manning, & Duffy (2012) offer insight and some guidelines into their stuttering-like behaviors: repetitions of initial syllables, whole-word repetitions, prolongations, obvious facial tension and grimaces, articulatory posturing or whispering before starting to speak, and hesitation or blocking before initial sounds. It is important to note that stuttering may not be this population's only problem that can be addressed by SLPs. Many of these veterans have attention problems, slow-processing time, and word-retrieval issues (Guitar, 2013).

Similar to psychogenic stuttering recommendations identified in the literature, trial therapy should be a key part of the initial evaluation (Guitar, 2014). This trial therapy can include muscle relaxation techniques where the clinician physical lowers the thyroid cartilage into a more relaxed position as the patient speaks (Roth, Manning, & Duffy, 2012). If fluency is not achieved, it is recommended that fluency-shaping techniques be taught. Guitar notes slow, prolonged, speech as a suggestion. In addition,



group therapy should be recommended to address accompanying issues like PTSD, depression, and sleep-problems.

### **Statement of the Problem**

Contradictory reports among the research available in identifying specific characteristics of neurogenic and psychogenic stuttering, as well as beneficial treatment strategies for practicing SLPs with this population. Previous studies related to neurogenic and psychogenic stuttering offered only small sample populations. Most studies reviewed included less than 20 people and some were only individual case studies. In addition, these studies focused on differential diagnosis of development and acquired stuttering and only sought to document the observable speech characteristics of each type of acquired stuttering. There is a lack of research that explores the knowledge, experience, and clinical perspective of currently practicing SLPs who diagnose and treat neurogenic and psychogenic stuttering.

The current survey was chosen to obtain a more direct and comprehensive view of SLPs knowledge and experience of neurogenic and psychogenic stuttering, as well as provide specific information about the diagnostic and therapeutic techniques SLPs use with this population.

## **Chapter III**

### **Methodology**

#### **Purpose and Research Questions**

The purpose of this study was to examine the perceptions and current practice patterns of SLPs diagnosing and treating individuals with two of the more common types of acquired stuttering—neurogenic and psychogenic stuttering. Specifically, this study’s purpose was two-fold. First, it aimed to identify characteristics of neurogenic and psychogenic stuttering from the perspective of the SLP. Second, it identified the most common therapeutic approaches SLPs with experience with clients with neurogenic and psychogenic stuttering typically use; specifically, those fluency enhancing and modification techniques that have proved most beneficial in therapy. This survey’s goal was to conclude what is working best for experienced SLPs in diagnosing and treating this population in order to provide a starting point from which current practicing and future SLPs in graduate training programs can work from when encountering neurogenic and psychogenic stuttering. The following are research questions for the current study:

1. How do SLPs perceive their knowledge about the nature of neurogenic or psychogenic stuttering?
2. What characteristics do SLPs observe in individuals with neurogenic and psychogenic stuttering?
3. What assessment and treatment approaches are SLPs using with individuals with neurogenic or psychogenic stuttering?

4. Are SLPs collaborating with other health professionals to aid in the diagnosis and treatment of neurogenic and psychogenic stuttering?

### **Research Design**

A survey research design was used in order to gather data regarding the clinical experiences and perceptions of SLPs treating neurogenic and psychogenic stuttering. The questions in the survey were divided into several parts. Section 1, the Demographic Profile, aimed to capture general information about the participant's clinical work setting, education level, years of experience in the field, perceptual ratings of their knowledge and experience with types of acquired stuttering, and number of acquired stuttering clients they have or are currently treating. The second section included questions about the participant's experience with a client with neurogenic stuttering. The questions required the participant to identify types of speech disfluencies or secondary behaviors observed, formal or informal assessments used in diagnosis, co-occurring disorders observed, beneficial therapeutic techniques, and possible collaboration with other health professionals. The third section included those same questions, but focused on the participant's experience with a client with psychogenic stuttering.

### **Participants and Sample**

The inclusion criteria for the participants of the survey included:

1. The participant must be a native English speaker.
2. The participant must have at least a Master's Degree in Communication Disorders.

3. The participant must have some experience with providing clinical services to an individual with neurogenic or psychogenic stuttering.

### **Recruitment and Data Collection**

Using convenience and purposive sampling paradigms, the investigator recruited participants from two sources to attain a nation-wide sample. These two samples were the following:

1. American Speech-Language-Hearing Association's (ASHA) special interest groups: SIG 4 Fluency and Fluency Disorders and SIG 2 Neurophysiology and Neurogenic Speech and Language Disorders.
2. Certified Specialists of the American Board in Fluency and Fluency Disorders were contacted via their emails which are public information and were accessed from the ABFFD website.

**ASHA Special Interest Groups.** The recruitment letter and the survey provided in Appendix A of this paper was distributed via the ASHA Community Special Interest Group discussion board to the members of those two special interest groups. The recruitment letter explained the title of the research proposal, inclusion criteria for the study, URL for the web-based survey instrument, and contact information of the primary investigator. Individuals who wish to participate in the survey could access it by clicking on the provided URL, which brought them to the web-based survey instrument called Survey Monkey. Reminder emails were sent to participants to complete the survey. Since the survey was distributed online, the context of the survey was wherever that SLP was located at the time he or she filled out the survey. The size of the sample depended on the

number of participants who completed the survey. There was no limit to the amount of participants who could complete the survey as long as they met the inclusion criteria.

**Board Certified Specialists in Fluency and Fluency Disorders.** Participant emails were gathered via the Internet as these emails are considered public information and added to a contact list. Once compiled, the initial email was sent out to this contact list three times. Included in this email was a recruitment letter that explained the title of the research proposal, inclusion criteria for the study, URL for the web-based survey instrument, and contact information of the primary investigator. Individuals who wanted to participate in the survey accessed it by clicking on the provided URL, which brought them to the web-based survey instrument called Survey Monkey. Reminder emails were sent to participants to complete the survey. Since the survey was distributed online, the context of the survey was wherever that SLP was located at the time he or she filled out the survey. The size of the sample depended on the number of participants who completed the survey. There was no limit to the amount of participants who could complete the survey as long as they met the inclusion criteria.

The questions included categorical variables in order to collect quantitative data about the different types of acquired stuttering. Categorical variables include yes and no questions, and questions that require the participant to rate their knowledge and experience of topics from least to greatest based on a Likert scale 1-5, as well as “check all that apply” questions. Some demographic information about the SLP participants was also collected.

## **Data Analysis**

Quantitative data was analyzed based on descriptive statistic calculations of each question. The descriptive statistics included frequency counts and percentages. The descriptive statistics aimed to identify the differences and similarities in clinical perceptions and practice patterns of SLPs with experience in offering clinical services to individuals with neurogenic or psychogenic stuttering and that of the current literature available.

## **Chapter IV**

### **Results**

This survey's purpose was to gather data regarding SLP's current perceptions and practice patterns in using clinical characteristics, diagnostic assessment protocols, therapeutic techniques, and collaboration efforts in regards to neurogenic and psychogenic stuttering. What is the current clinical practice of experienced SLPs with neurogenic and psychogenic stuttering? The target population sample was those SLPs with specific experience working with neurogenic or psychogenic stuttering.

Of the three professional groups surveyed—American Board of Fluency Disorders, ASHA Special Interest Group #2 Neurophysiology and Neurogenic Speech and Language Disorders, ASHA Special Interest Group #4 Fluency and Fluency Disorders—40 speech-language pathologists (SLPs) (n=40) responded to the survey. The breakdown of the target population surveyed is as follows: SIG 2 Neurophysiology and Neurogenic Speech and Language Disorders (n=4748 members total); SIG 4 Fluency and Fluency Disorders (n=1311 members total); American Board of Fluency Disorders (n=99 emails of members retrieved). Forty SLPs responded to the survey, which was distributed three times across September 16, 2014 to November 20, 2014. One participant was excluded due to a failure to indicate that he or she had attained at least their Master's degree in speech-language pathology and therefore, did not meet all the inclusion criteria required for participation in this research study. As a result, thirty-nine of the 40 participants met the initial inclusion criteria for this research study.

## **Participant Demographics**

Twenty-eight (71.79%) of the 39 participants who completed the survey reported having more than 15 years of experience working as a speech-language pathologist. Five (12.82%) participants reported between 11 and 15 years of experience, three participants (7.69%) indicated six to ten years experience, and the remaining three respondents (7.69%) reported five years or less of experience.

Twenty-six participants out of 39 participants (66.67%) reported a master's degree as their highest degree attained, while the remaining 13 participants (33.33%) reported a doctoral degree as their highest academic degree. Thirty-eight of the 39 participants (97.44%) affirmed that they had obtained the certificate of clinical competence through the American-Speech-Language-Hearing Association; one participant indicated as not having it (2.56%).

Of the 39 participants, 17 (43.59%) identified themselves as Board Certified Specialists in Fluency recognized by the American Board of Fluency Disorders; 22 participants (56.41%) did not identify themselves as such. Thirty-seven out of 39 participants responded to a question indicating that they have provided clinical services for at least one client with acquired stuttering, while two participants did not respond this question.

Currently, 16 participants (41.03%) have client(s) with acquired stuttering on their caseloads, while 23 (58.97%) reported to not have any client(s) of this diagnostic population on their caseload. Sixteen participants of the 39 participants (41.03%) who



responded to this question reported providing services to clients with either neurogenic or psychogenic stuttering while working in a private practice. Fifteen of the 39 participants (38.46%) reported experience with acquired stuttering in a rehabilitation center; 12 participants (30.77%) reported a hospital setting, while 5 participants (12.82%) reported working in a school setting.

Thirty-four of the 38 participants (89.47%) who responded to this question reported having provided services or are currently providing services to adult-aged clients with neurogenic or psychogenic stuttering, 15 participants (39.47%) reported having treated it in adolescents, 12 (31.58%) reported treating school-age children, and seven (18.42%) reported it in preschool-age children.

Of the 38 participants who answered this question, 19 participants (50%) reported having provided clinical services to between one and five clients with acquired stuttering, 11 participants (28.95%) reported treating between six and ten, and eight participants (21.05%) claimed to provide services to ten or more clients throughout their career. One participant did not respond to this survey question.

Of the four different kinds of acquired stuttering, 38 out of 39 participants who responded to this question (97.44%) reported treating clients with neurogenic stuttering, 23 participants (58.97%) reported providing services to clients with psychogenic stuttering, 13 participants (33.33%) treated clients with pharmacogenic stuttering, and six participants (15.38%) claimed to service clients with malingering stuttering. No participants indicated that they had never provided clinical services to someone with acquired stuttering.

## **Participant Ratings of Knowledge of Acquired Stuttering Disorders**

The participants were asked to rate their perception of their own knowledge of each type of acquired stuttering disorder provided a Likert scale 1-5 (1= being no knowledge, 2 = a little knowledge, 3 = some knowledge, 4 = knowledgeable, and 5 = very knowledgeable). Sixteen of 39 participants who responded to this question (41.03%) rated themselves as 4 = knowledgeable in regards to neurogenic stuttering, 15 (38.46%) gave a rating of 3 = some knowledge, seven participants (17.95%) rated themselves as 5 = very knowledgeable, one participant (2.56%) responded with 2 = a little knowledge, and no participants rated themselves as having 1 = no knowledge of neurogenic stuttering. In total, the 39 participants who rated their knowledge of neurogenic stuttering indicated a weighted average rating of 3.74 (between 3 = some knowledge and 4 = knowledgeable) on the Likert scale 1-5 previously described.

The second highest weighted average based on the 39 participant ratings was their perceived knowledge of psychogenic stuttering which averaged to 3.36 (between 3 = some knowledge and 4 = knowledgeable) on the Likert scale 1-5. Sixteen of the 39 participants (41.03%) rated themselves as 3 = having some knowledge of psychogenic stuttering, 14 participants (35.90%) rated themselves as 4 = knowledgeable, six participants (15.38%) rated themselves as 2 = a little knowledge, and 3 participants (7.69%) rated themselves as 5 = very knowledgeable. No participants rated themselves as having 1 = no knowledge of psychogenic stuttering.

Thirty-seven of the 39 participants rated their knowledge of malingering stuttering; two participants did not give ratings for this type of acquired stuttering. Eleven

of the 37 participants (29.73%) who responded rated themselves as 3 = having some knowledge, ten (27.03%) rated themselves as 2 = having a little knowledge, another ten (27.03%) rated themselves as 4 = knowledgeable, while six (16.22%) rated themselves as 1 = having no knowledge. No participants rated themselves as 5 = very knowledgeable. The weighted average reported for the total 37 participants who rated their knowledge of malingering stuttering was 2.68—falling between 2 = having a little knowledge and 3 = having some knowledge.

Thirty-eight of the 39 participants rated their knowledge of pharmacogenic stuttering; one participant did not provide ratings for this type of acquired stuttering. Twelve participants (31.58%) rated themselves as 3 = having some knowledge of pharmacogenic stuttering, 11 participants (28.95%) rated themselves as 1 = having no knowledge, eight participants (21.05%) rated themselves as 4 = knowledgeable, six participants (15.79%) rated themselves as 2 = having a little knowledge, and one participant rated themselves as 5 = very knowledgeable (2.63%). The weighted average reported for the total 38 participants who rated their knowledge of malingering stuttering was 2.53—falling between 2 = having a little knowledge and 3 = having some knowledge.

### **Participant Ratings of Level of Experience with Acquired Stuttering Disorders**

The 39 participants were asked to rate their perceived level of experience with each type of acquired stuttering disorder provided a Likert scale 1-5 (1= being no experience, 2 = a little experience, 3 = some experience, 4 = experienced, and 5 = very experienced). Thirteen of 39 participants who responded to this question (33.33%) rated

themselves as 4 = experienced when it comes to neurogenic stuttering, 12 (30.77%) rated themselves as 3 = somewhat experienced, 11 (28.21%) rated themselves as 2 = having a little experience, and 3 participants (7.69%) rated themselves as 5 = being very experienced. No participants rated themselves as 1 = having no experience with neurogenic stuttering. The overall weighted average for these 39 participants was 3.21 — which fell between 3 = being somewhat experienced and 4 = being experienced based on the Likert scale (1-5) provided.

In regards to experience with psychogenic stuttering, 12 of the 39 participants who responded to this question (30.77%) rated themselves as 3 = somewhat experienced, 10 participants (25.64%) rated themselves as 2 = having a little experience, 9 participants (23.08%) rated themselves as 4 = experienced, 6 participants rated themselves as 1 = no experience, and 2 participants (5.13%) rated themselves as 5 = very experienced. The overall weighted average based on participant ratings of their experience level with psychogenic stuttering was 2.77 — which fell between 2 = having a little experience and 3 = being somewhat experienced based on the Likert scale (1-5) provided.

Thirty-eight of the 39 participants rated their level of experience with malingering stuttering; one participant did not provide a rating for this type of acquired stuttering. Twenty-one of 38 participants (55.26%) rated themselves as 1 = having no experience with malingering stuttering, seven participants (18.42%) reported being 3 = somewhat experienced, six (15.79%) rated themselves as 2 = having a little experience, and one participant (2.63%) reported a rating of 5 = being very experienced with this population. The overall weighted average based on these participant ratings of their level of

experience with malingering stuttering was 1.87 — which fell between 1 = no experience and 2 = a little experience.

Thirty-seven of the 39 participants rated their level of experience with pharmacogenic stuttering, two participants did not provide ratings. Fourteen of the thirty-seven participants rated themselves as 1 = having no experience (37.84%), ten participants (27.03%) rated themselves as 2 = having a little experience, ten participants (27.03%) rated themselves as 3 = somewhat experienced, and 3 (8.11%) rated themselves as 4 = experienced. No participants rated themselves as 5 = very experienced in regards to pharmacogenic stuttering. The overall weighted average of these participant ratings of their level of experience with pharmacogenic stuttering was 2.05 — which fell between 2 = a little experience and 3 = somewhat experienced on the Likert scale (1-5) provided.

### **Clinical Characteristics of Neurogenic Stuttering**

Twenty-seven of the 39 participants (69.23%) reported that their clients with neurogenic stuttering had a case history of traumatic brain injury prior to onset. Twenty-three participants (58.97%) reported a history of stroke, 16 (41.03%) reported a history of neurodegenerative disease, 2 (5.13%) saw clients with previous military combat experience, and 3 (7.69%) reported observing none of these previously stated diagnosis in their clients' case histories. One participant (2.56%) reported never having seen anyone with neurogenic stuttering. (See Q13)

Twenty-three of the 35 participants (65.71%) who responded to this question reported having observed aphasia as a co-occurring disorder in their clients with neurogenic stuttering, thirteen participants (37.14%) specified Parkinson's Disease, 10 participants (28.57%) noted Apraxia, 9 (25.71%) reported brain tumors, 3 (8.57%) noted co-occurring Dementia, while only one participant (2.86 %) saw co-occurring Alzheimer's Disease. One participant (2.86%) reported never having seen someone with neurogenic stuttering. Twelve participants out of the 35 participants who responded to this question (34.29%) also chose "Other" and recorded open-ended responses of more co-occurring disorders not previously mentioned in the survey question. These open-ended participant responses include specific cases of mental illness as in taking large doses of medication that caused odd behaviors, lack of activity, or fluctuation in mood; residual physical problems following being struck by an automobile, incontinence, bilingual so patient was difficult to assess language or presence of aphasia; three participants mentioned presence of a seizure disorder; Post Traumatic Stress Disorder (PTSD); Subcortical Epilepsy; Anoxia; possible mild apraxia/expressive syntactic aphasia which was difficult to parse; sudden onset of stuttering post-surgery to disconnect the corpus callosum secondary to uncontrollable seizure disorder; memory and concentration also due to traumatic brain injury; developmental stuttering that resolved totally and re-emerged after head injury or onset of Parkinson's Disease; one participant observed no co-occurring disorders and another mentioned traumatic brain injury again. (See Q14)

Participants were asked to select from a list compiled by (Manning, 2010) certain characteristics of neurogenic stuttering they have observed in their experience with this population. Thirty-eight participants responded to this question, one participant provided no response. Thirty-four participants of the 38 (89.47%) who responded to this question noted that their client(s) had no previous history of disfluency. Twenty-six participants (68.42%) reported observing negative affective and cognitive responses to their acquired stuttering disorder. Twenty-one participants (55.26%) reported observing consistent disfluent productions even during automatic speech tasks. Twenty participants (52.63%) observed lack of improved fluency in their clients when using fluency-enhancing techniques. Nineteen participants (50%) indicated that their clients' fluency was not setting or situation specific and varied across speaking tasks and situations. Eighteen participants (47.37%) noted that their clients exhibited secondary behaviors during disfluent moments. Seventeen participants (44.74%) described their clients stuttering as more frequently occurring on the middle and final syllables of words. Ten participants (26.32%) reported observing a decrease in stuttering moments with repeated readings of a passage (adaptation effect) in their clients with neurogenic stuttering. (See Q16)

### **Diagnostic Assessment of Neurogenic Stuttering**

Participants were asked to identify what formal or informal diagnostic instruments they have used to diagnose a client with neurogenic stuttering. Thirty-seven of the 38 participants (97.37%) who answered this survey question reported collecting and analyzing a speech sample for documenting disfluencies; 36 participants (94.74%) use a case history form; 34 (89.47%) assess cognitive and affective components; and 14

participants (36.84%) reported “Other.” Participants’ open-ended responses included their use of input from others in the person’s environment about changes in stuttering and its impact of these, motor speech examination, response to fluency management strategies, medical records (MRI, CT scans), various types of tasks (automaticity, reading, medical reviews, consistency in tasks, adaptation, SSI-4, ABA, WAB, Robertson to rule out aphasia/motor speech disorders, OASES, paper and pencil tools to assess attitudes/beliefs, speech-language and voice assessment, consultation with other practitioners, interview with family members, other informal tasks dependent on the client’s neurological disorder, same assessment for developmental stuttering (SSI-4, OASES, BAB, WASSP, 0-10 scale for goals and where they are at now and adjust it according to deficits due to head injury etc. One participant out of 38 did not respond to this survey question. (See Q15)

### **Treatment Approaches for Neurogenic Stuttering**

Participants were asked about the types of treatment techniques they have experience using with clients with neurogenic stuttering. Thirty-one of the 39 participants (79.49%) who responded to this question reported using slower rate of speech, 31 (79.49%) reported using counseling techniques, 29 (74.36%) reported using controlled phrasing (pausing), 26 (66.67%) reported using easy onsets, 16 (41.03%) use a pacing board, 14 (35.90%) use desensitization strategies, 10 (25.64%) practice pseudo-stuttering (voluntary stuttering), 4 (10.26%) use delayed auditory feedback, and 1 person (2.56%) reported never having seen a client with neurogenic stuttering. Six participants (15.38%) chose “Other” and recorded the following additional strategies as part of their list of



therapeutic techniques they have used: metronome, techniques chosen depend on the individual client, using various accents, chanting or sing-song prosodic contour, continuous phonation, light contact, acceptance of disorder and difference in speech post-onset of Parkinson's Disease, task analysis/cueing hierarchy in linguistic tasks (See Q17).

Next, participants were asked to rate how beneficial these techniques have been in treating clients with neurogenic stuttering based on their experience provided a Likert scale 1-5 (1= not beneficial, 2 = somewhat beneficial, 3 = beneficial, 4 = very beneficial, and 5 = most beneficial). Thirty-nine participants responded to this survey question. Ten participants out of 37 participants who rated easy onsets (27.03%) rated this technique as 2 = somewhat beneficial, 10 (27.03%) rated it as beneficial, eight participants (21.62%) selected "N/A", five (13.51%) rated it as very beneficial, three participants (8.11%) responded with 1 = not beneficial, and one participant (2.7%) rated it as 5 = most beneficial. The weighted average reported for the 37 participants who rated how beneficial easy onsets were in treating neurogenic stuttering was 2.69—falling between 2 = somewhat beneficial and 3 = beneficial.

Ten participants out of the 36 participants (27.78%) who rated how beneficial controlled phrasing (pausing) is for treating neurogenic stuttering chose 3 = beneficial, eight participants (22.22%) rated it as 4 = very beneficial, six (16.67%) reported this technique as 2 = somewhat beneficial, six participants chose "N/A", three participants (8.33%) rated it as 1 = not beneficial, and three (8.33%) rated it as 5 = most beneficial. The weighted average reported for the 36 participants who rated how beneficial

controlled phrasing (pausing) is in treating neurogenic stuttering was 3.07—falling between 3 = beneficial and 4 = very beneficial.

Eleven participants out of the 34 (32.35%) who rated how beneficial slower rate of speech is for treating neurogenic stuttering chose 4 = very beneficial, ten participants (29.41%) gave a rating of 3 = beneficial, six participants (17.65%) rated it as 2 = somewhat beneficial, three participants (8.82%) chose “N/A”, two participants (5.88%) rated slower rate of speech as 1 = not beneficial, and two (5.88%) rated it as 5 = most beneficial. The weighted average reported for the 34 participants who rated how beneficial using a slower rate of speech is in treating neurogenic stuttering was 3.16—falling between 3 = beneficial and 4 = very beneficial.

Fifteen participants (46.88%) out of the 32 who rated how beneficial the pacing board is for treating neurogenic stuttering rated is as “N/A”, seven participants (21.88%) rated it as 3 = beneficial, four participants (12.50%) rated it as 1 = not beneficial, three (9.38%) rated it as 2 = somewhat beneficial, two (6.25%) rated it as 4 = very beneficial, and one participant (3.13%) rated it as 5 = most beneficial. The weighted average reported for the 32 participants who rated how beneficial using a pacing board is in treating neurogenic stuttering was 2.59—falling between 2 = somewhat beneficial and 3 = beneficial.

Twenty participants (74.07%) out of the 27 who rated how beneficial using Delayed Auditory Feedback is for treating neurogenic stuttering chose “N/A”, three participants (11.11%) rated it as 3 = beneficial, two participants (7.41%) rated Delayed Auditory Feedback (DAF) as 1 = not beneficial, two participants (7.41%) rated this

technique as 2 = somewhat beneficial, and zero participants rated it as 4 = very beneficial nor 5 = most beneficial. The weighted average reported for the 27 participants who rated how beneficial using Delayed Auditory Feedback (DAF) is in treating neurogenic stuttering was 2.14—falling between 2 = somewhat beneficial and 3 = beneficial.

Fourteen participants (50%) out of the 28 participants who rated how beneficial using pseudostuttering (voluntary stuttering) in treating neurogenic stuttering chose “N/A”, five participants (17.66%) rated it as 2 = somewhat beneficial, five participants (17.66%) rated it as 3 = beneficial, two participants (7.14%) rated it as 1 = not beneficial, two participants (7.14%) reported it as 4 = very beneficial, and zero participants rated it as 5 = most beneficial. The weighted average reported for the 28 participants who rated how beneficial using pseudostuttering (voluntary stuttering) is in treating neurogenic stuttering was 2.50—falling between 2 = somewhat beneficial and 3 = beneficial.

Fourteen participants (46.67%) out of the 30 participants who rated how beneficial using desensitization in treating neurogenic stuttering chose “N/A”, seven participants (23.33%) rated it as 3 = beneficial, four (13.33%) rated this technique as 4 = very beneficial, two participants (6.67%) rated it as 1 = not beneficial, two (6.67%) others rated it as 2 = somewhat beneficial, and one participant (3.33%) rated it as 5 = most beneficial. The weighted average reported for the 30 participants who rated how beneficial using desensitization is in treating neurogenic stuttering was 3.00, meaning it was considered as 3 = beneficial on the Likert scale.

Ten participants (27.78%) out of 36 who rated how beneficial counseling is in treating neurogenic stuttering rated it as 4 = very beneficial, eight (22.22%) rated it as 3 =

beneficial, seven participants (19.44%) rated it as 2 = somewhat beneficial, seven (23.33%) rated it as 5 = most beneficial, three participants (8.33%) chose “N/A”, and one participant (2.78%) rated counseling as 1 = not beneficial. The weighted average reported for the 36 participants who rated how beneficial providing counseling is in treating neurogenic stuttering was 3.45—falling between 3 = beneficial and 4 = very beneficial. (See Q18)

### **Referral to Other Health Professionals Regarding Neurogenic Stuttering**

Twenty participants of the 38 participants (52.63%) who answered this survey question revealed to never having referred a person with neurogenic stuttering to a medical doctor or mental health professional. Thirteen participants (34.21%) said they had referred this type of client to a medical doctor, while 12 (31.58%) reported having referred this clientele to a mental health professional. Two participants (5.26%) reported to never having seen a client with neurogenic stuttering. (See Q19)

### **Clinical Characteristics of Psychogenic Stuttering**

Thirty-nine participants answered this survey question regarding specific mental health diagnosis present in the case histories of their client’s with psychogenic stuttering. Twenty-two participants (56.41%) reported seeing anxiety as part of their clients’ case history along with the presence of psychogenic stuttering. Sixteen participants (41.03%) reported depression as a co-existing medical diagnosis in their clients, 17 (43.59%) reported Post-Traumatic Stress Disorder (PTSD), six participants (15.38%) observed clients with a case history of previous military combat, three (7.69%) reported observing

none of these medical diagnosis. Ten participants (25.64%) stated that they had never seen someone with psychogenic stuttering. (See Q20)

Twenty-nine participants selected from a list compiled by (Manning, 2010) certain characteristics of psychogenic stuttering they have observed in their experience with this population. Of this number, twenty-four participants (82.76%) reported their clients with psychogenic stuttering exhibiting a history of psychological or emotional issues. Eighteen participants (62.07%) selected that their clients had a lack of improved fluency when using fluency-enhancing techniques, eight (27.59%) reported observing quick improvement following disclosure of a traumatic or emotional event, nine (31.03%) reported rapid responses to trial therapy, and 14 (48.28%) saw a pattern of increased disfluency during less difficult speaking tasks. Eight participants (27.59%) documented that their clients disfluencies persisted or became more severe in successive reading of a passage, 13 (44.83%) noted unusual struggle behaviors not associated with disfluent moments, 11 (37.93%) saw unusual grammar usage, eight (27.59%) observed repetitions of almost all phonemes with secondary behaviors, and 21 participants (72.41%) reported intermittent or situation-specific patterns of stuttering episodes within their clients. Ten participants did not provide responses to this survey question. (See Q22)

### **Diagnostic Assessment of Psychogenic Stuttering**

Participants were asked to identify some formal and informal diagnostic measurements they have experience using with clients with psychogenic stuttering. Of the 29 participants who responded to this question, all 29 (100%) reported collecting and

analyzing disfluencies in speech samples to diagnose a client with psychogenic stuttering. Twenty-eight (96.55%) reported using a case history form as part of their assessment battery, while 26 (89.66%) used assessments of cognitive and affective components of stuttering to support their diagnosis. Eight participants (27.59%) selected “Other” and specified that they discussed client’s speech with others in current and close contact with the client on a daily basis, used motor speech examinations, interviews, SSI-4, and paper and pencil tools to assess attitudes and beliefs. Ten participants chose to skip this survey question. (See Q21)

### **Treatment Approaches for Psychogenic Stuttering**

Thirty-seven participants out of the total 39 participants identified certain therapeutic approaches they have used with clients with psychogenic stuttering; two participants did not provide responses. Twenty-four participants (64.88%) reported using counseling strategies, 19 participants (51.35%) used easy onsets, and 17 (45.95%) reported using controlled phrasing, 17 (45.95%) reported using slower rate of speech, ten participants (27.03%) reported using desensitization tasks, 8 (21.62%) used pseudo-stuttering, and 2 (5.41%) reported using delayed auditory feedback. Eight participants (21.62%) admitted to having never seen anyone with psychogenic stuttering. Six participants (16.22%) selected “Other” as an option and then specified their responses to include addressing cognitive concerns and executive function, multiple other techniques depending on specific fluency features, referral to other mental health professionals, using masking, EFT (tapping), Solution-focused Brief Therapy, meditation/relaxation, support groups, and controlled use of muscle relaxation techniques. (See Q23)

Participants were asked to rate how beneficial these techniques have been in treating clients with psychogenic stuttering based on their experience provided a Likert scale 1-5 (1= not beneficial, 2 = somewhat beneficial, 3 = beneficial, 4 = very beneficial, and 5 = most beneficial). Thirty-three participants responded to this survey question, 6 participants did not respond. Seven participants (25%) out of the twenty-eight who rated how beneficial using easy onsets is in treating psychogenic stuttering rated it as 2 = somewhat beneficial, six (21.43%) chose “N/A”, five (17.86%) rated it as 1 = not beneficial, four (14.29%) rated it as 3 = beneficial, four (14.29%) rated it as 4 = very beneficial, two participants (7.14%) rated it as 5 = most beneficial. The weighted average reported for the 28 participants who rated how beneficial using easy onsets is in treating psychogenic stuttering was 2.59, meaning it was considered between 2 = somewhat beneficial and 3 = beneficial on the Likert scale.

Nine participants (33.33%) of the 27 participants who rated how beneficial using controlled phrasing (pausing) is in treating psychogenic stuttering chose “N/A”, seven (25.93%) rated it as 3 = beneficial, five (18.52%) rated it as 2 = somewhat beneficial, three (11.11%) rated it as 4 = very beneficial, 3 participants (11.11%) rated it as 5 = most beneficial, and no participants rated it as 1 = not beneficial. The weighted average reported for the 27 participants who rated how beneficial using controlled phrasing (pausing) is in treating psychogenic stuttering was 3.22, meaning the mean fell between between 3 = beneficial and 4 = very beneficial on the Likert scale.

Nine participants of the 25 participants who rated how beneficial using a slower rate of speech is in treating psychogenic stuttering chose “N/A”, five participants (20%)

rated is as 4 = very beneficial, five participants (20%) rated it as 2 = somewhat beneficial, three (12%) rated it as 5 = most beneficial, three (12%) rated it as 3 = beneficial, and no participants rated it as 1 = not beneficial. The weighted average reported for the 25 participants who rated how beneficial using slower rate of speech is in treating psychogenic stuttering was 3.38, meaning the mean fell between 3 = beneficial and 4 = very beneficial on the Likert scale.

Thirteen participants (56.52%) of the 23 participants who rated how beneficial using pseudostuttering (voluntary stuttering) is in treating psychogenic stuttering chose “N/A”, four participants (17.39%) rated it as 3 = beneficial, three participants (13.04%) rated it as 2 = somewhat beneficial, two (8.70%) rated it as 1 = not beneficial, one participant (4.35%) rated it as 4 = very beneficial, and no participants rated it as 5 = most beneficial. The weighted average reported for the 23 participants who rated how beneficial using pseudostuttering (voluntary stuttering) is in treating psychogenic stuttering was 2.40, meaning the mean fell between 2 = somewhat beneficial and 3 = beneficial on the Likert scale.

Fourteen participants (56%) out of the 25 participants who rated how beneficial using desensitization is in treating psychogenic stuttering chose “N/A”, six participants (24%) rated it as 3 = beneficial, two participants (8%) rated it as 5 = most beneficial, two (8%) rated it as 1 = not beneficial, one participant (4%) rated it as 4 = very beneficial, and no participants rated it as 2 = somewhat beneficial. The weighted average reported for the 25 participants who rated how beneficial using desensitization is in treating



psychogenic stuttering was 3.09, meaning the mean fell between 3 = beneficial and 4 = very beneficial on the Likert scale.

Fifteen participants (78.95%) out of the 19 participants who rated how beneficial delayed auditory feedback is in treating psychogenic stuttering chose “N/A”, three participants (15.79%) chose 1 = not beneficial, one participant (5.26%) rated it as 2 = somewhat beneficial, and no participants rated it as 3 = beneficial, 4 = very beneficial, or 5 = most beneficial. The weighted average reported for the 19 participants who rated how beneficial using delayed auditory feedback is in treating psychogenic stuttering was 1.25, meaning the mean fell between 1 = not beneficial and 2 = somewhat beneficial on the Likert scale.

Nine participants (29.03%) out of the 31 participants who rated how beneficial counseling is in treating psychogenic stuttering rated it as 5 = most beneficial, seven participants (22.58%) chose “N/A”, six participants (19.35%) rated it as 4 = very beneficial, six participants (19.35%) rated it as 3 = beneficial, two participants (6.45%) rated it as 2 = somewhat beneficial, and one participant (3.23%) rated it as 1 = not beneficial. The weighted average reported for the 31 participants who rated how beneficial using counseling is in treating psychogenic stuttering was 3.83, meaning the mean fell between 3 = beneficial and 4 = very beneficial on the Likert scale. (See Q24)

### **Referral to Mental Health Professionals Regarding Psychogenic Stuttering**

Participants were asked to respond yes or no to whether or not they have referred clients with psychogenic stuttering to a mental health professional. Twenty participants (57.14%) of 35 respondents reported that they have referred a client with psychogenic stuttering to a mental health professional. The remaining 15 participants (42.86%) reported never having referred a client with psychogenic stuttering to a mental health professional. (See Q25)

## Chapter V

### Discussion and Conclusions

This study investigated four research questions with regards to neurogenic and psychogenic stuttering: 1) How do SLPs perceive their knowledge about the nature of neurogenic or psychogenic stuttering?; 2) What characteristics do SLPs observe in individuals with neurogenic and psychogenic stuttering?; 3) What assessment and treatment approaches are SLPs using with individuals with neurogenic or psychogenic stuttering?; 4) Are SLPs collaborating with other health professionals to aid in the diagnosis and treatment of neurogenic and psychogenic stuttering? Survey results, implications for clinical practice and future research, as well as the study's limitations are discussed in this chapter. The survey results will be discussed in the order of the research questions and some research questions will be divided into neurogenic and psychogenic categories.

#### Discussion

**Participants' ratings of perceived knowledge of neurogenic and psychogenic stuttering compared to their reported clinical experience.** Theys, van Wieringen, Sunaert, Thijs, & De Nil (2011) previously reported that neurogenic stuttering has been considered a rare phenomenon among SLPs in the field. Market, Montague, Buffalo, & Drummond (1990) reported that 100 out of 150 SLPs (66.67%) they surveyed had at least one client with neurogenic stuttering on their caseload. The results of the current survey reported that of the 39 SLPs surveyed who reported to have experience treating acquired stuttering, 38 said they had treated clients with neurogenic stuttering and 23 reported they had treated clients with psychogenic stuttering. In general, acquired stuttering may

remain a rare occurrence in the field, however, results of the current study revealed that neurogenic stuttering is the most commonly observed type of acquired stuttering and psychogenic stuttering is the second most common among the sampled population of experienced SLPs.

The survey results from this study revealed that SLPs who have experience working with acquired stuttering currently perceive themselves as either having “3=some knowledge” or consider themselves “4=knowledgeable” in regards to both neurogenic and psychogenic stuttering. However, the survey results revealed that these participants rated themselves as being “3=somewhat experienced” and “4=experienced” in regards to providing clinical experience with neurogenic stuttering. Whereas, SLPs rated themselves as “2=having a little experience” and “3=being somewhat experienced” when it came to psychogenic stuttering. These ratings could be directly attributed to the fact that among the population of SLPs sampled 38 out of 39 participants reported that they had provided clinical services to clients with neurogenic stuttering. In contrast, only 23 out of 39 participants reported having provided clinical services to clients with psychogenic stuttering resulting in the lower Likert scale ratings in regards to perceived level of experience. Therefore, it can be concluded from these results that the SLPs surveyed have more experience providing clinical services for neurogenic stuttering than psychogenic stuttering and their perceived level of knowledge reflects this experience.

**Reported characteristics observed in clients with neurogenic stuttering.**

Thirty-four out of 38 participants who answered the survey agreed with Manning (2010) that their clients had no previous history of disfluency prior to onset. Twenty out of 38 participants who answered this survey question agreed that their clients with neurogenic

stuttering exhibited a lack of improved fluency during fluency-enhancing speaking tasks (i.e., choral reading, repetitive readings of the same passage). Twenty-one of 38 also agreed that their clients showed a lack of improved fluency during automatic speaking tasks (i.e., reciting the ABC's). Seventeen of the same 38 participants who responded to this question confirmed Manning's observation that stuttering occurred more frequently on the middle and final syllables of words.

Nineteen out of 38 of the current study's participants also agreed with Yairi and Seery's (2011) conclusions that individuals with neurogenic stuttering have a low consistency effect in that their disfluent moments cannot be attributed to any one setting or speaking task.

Manning (2010) did not mention the presence of secondary behaviors in clients with neurogenic stuttering, however, Helm-Estabrooks (1999) reported in her list of clinical characteristics of neurogenic stuttering that individuals with neurogenic stuttering exhibit no secondary behaviors. In contrast, the results of this study revealed that 18 out of 38 (47.36%) SLPs who responded to this survey question had observed secondary behaviors associated with disfluent moments in their clients with neurogenic stuttering. Koenig's (2009) study revealed an even more overwhelming number in that 95.1% of the 61 SLPs surveyed observed secondary in their clients with neurogenic stuttering.

**Reported neural etiology of neurogenic stuttering.** In addition, some participants listed a number of neural etiologies that matched Manning's (2010) and Theys et al. (2007) estimations. This study found that 27 out of 39 SLPs (69.23%) reported their clients having a history of traumatic brain injury prior to onset, 23 of 39 (58.97%) reported a history of stroke, and 16 of 39 (41.02%) reported a history of

neurodegenerative disease. The data collected from Theys et al. (2007) reported 29 of the 58 clients (50%) reported onset of neurogenic stuttering a month after a stroke, 11 of 29 (37.93%) of clients reported traumatic brain injury prior to onset, and nine of 29 (31.03%) of clients reported history of neurodegenerative disease prior to onset. Therefore, participants in this research study are in agreement with Manning (2010) and Theys et al. (2007) in that they reported the most common neural etiologies for neurogenic stuttering found in their clients include traumatic brain injury, stroke, and neurodegenerative disease.

Similarly, some participants in this study revealed that there are often co-occurring disorders and neurodegenerative diseases, which were similar to the findings of Koenig (2009), Ludlow and Loucks (2003), Tani and Sakai (2010), and Theys et al. (2007). Twenty-three of the 35 SLPs (65.71%) who answered this survey question reported that Aphasia was the most often co-occurring along with neurogenic stuttering. Thirteen of 35 SLPs reported co-occurring Parkinson's Disease, three reported co-occurring Dementia, and 1 reported Alzheimer's Disease which are similar to Theys et al. (2007) findings in which nine of 29 clients reported neurodegenerative disease, six of nine had bilateral lesions and subcortical atrophy. Similarly, Koenig (2009) found in her study that of all the reported cases of neurogenic stuttering she collected from her survey of 61 SLPs in Germany, three-fourths of those studies reported co-occurring communication disorders. In addition, Koenig (2009) found that in every second case reported the participant indicated a co-occurring presence of aphasia with neurogenic stuttering. Ludlow and Loucks's (2003) conclusions confirm that neurogenic stuttering is most likely caused by damage to the basal ganglia, corpus callosum, and thalamus which

are also major indicators of neurodegenerative diseases such as Parkinson's Disease. However, Ludlow and Loucks' (2003) findings revealed that it is hard to say for sure that neurogenic stuttering is caused by these specific lesion sites because often times there is co-occurring Aphasia (caused by damage to the left hemisphere language areas) in addition to the presence of neurogenic stuttering speech characteristics. Twenty-three out of 35 SLPs who responded to this specific survey question in the current study reported observing co-occurring Aphasia with their clients with neurogenic stuttering.

However, Tani & Sakai's (2010) research, which looked at only basal ganglia involvement and the presence of neurogenic stuttering in individuals found several differences in the clinical characteristics reported by some of the SLPs in this current research study as well as Helm-Estabrooks (1999) and Manning's (2010) characteristics. Tani and Sakai (2010) found that their participants had improved fluency during fluency-enhancing speaking tasks such as repetitive reading of a passage, the majority of the disfluencies occurred on the initial sounds in words, and stuttering moments were often attributable to certain settings and tasks. More research is needed to confirm the idea that neurogenic stuttering may be caused by a combination of a number of lesion sites in the brain, which include but are not limited to the basal ganglia.

**Reported assessment protocol used with neurogenic stuttering.** Results revealed that the majority of these participants in the current study reported using a case history, assessed cognitive and affective components of disfluency, and collected and analyzed speech samples as part of their formal assessment battery. However, 14 out of 38 participants who responded to this question reported in "Other" as open-ended responses that their assessment battery looks similar to what Helm-Estabrooks (1999) and

De Nil, Jokel, and Rochon (2007) suggest in their research: Aphasia Diagnostic Profiles (Helm-Estabrooks, 1992), motor speech exams aimed at confirming or denying the presence of aphasia, dysarthria, and other cognitive disorders. SLPs listed, in addition to traditional disfluency assessment protocols previously listed, to using MRI/CT scans to examine specific lesion sites, motor speech exams, Stuttering Severity Instrument, Fourth Edition (SSI-4), Western Aphasia Battery (WAB), Apraxia Battery for Adults (ABA), Robertson's Dysarthria Profile, Behavior Assessment Battery for School-Age Children Who Stutter (BAB), and the Overall Assessment of the Speaker's Experience of Stuttering (OASES) as part of their assessment battery to uncover, through the process of elimination, a diagnosis of neurogenic stuttering. Therefore, based on these reports from the participants in the current study, it may be best practice to use a combination of assessments for motor speech disorders, aphasia and cognitive disorders in addition to traditional fluency assessment instruments like the SSI-4 and OASES to further identify this disorder.

**Reported therapeutic approaches with neurogenic stuttering.** The results of this research study reveal that these participants are in agreement with Market, Montague, Buffalo, and Drummond (1990) in that some use fluency-enhancing techniques, specifically slower rate of speech, controlled pausing or phrasing, and easy onsets. However, slower rate of speech, controlled phrasing (pausing), counseling and desensitization were given the highest overall average ratings of between "3=beneficial" and "4=very beneficial". Easy onsets were given an average rating between "2=somewhat beneficial" and "3=beneficial". Less of the SLPs reported using pacing boards (n=16) and delayed auditory feedback (n=4) suggested by Helm-Estabrooks



(1999), but these strategies were given ratings between “2=somewhat beneficial” and “3=beneficial”. The results from this study reveal that participants reported using fluency-enhancing techniques with individuals with neurogenic stuttering, but no participant rated them as “5 = most beneficial”.

Koenig (2009) found similar reports of SLPs using easy onsets, rhythmical speech, and a slow speech rate as well as counseling and desensitization strategies to reduce anxiety with their clients with neurogenic stuttering. Similarly, she found that there was adequate progress in therapy with these speech techniques, but a minimal amount of carryover for clients with neurogenic stuttering outside of the therapy room. Koenig’s (2009) survey revealed that 94.9% of the 61 SLPs she surveyed reported to use psychosocial methods in their treatment of neurogenic stuttering.. Koenig observed significant improvements in psychosocial factors with therapy as it relates to improvements outside of the therapy room. Specifically, her results revealed that when treatment focused on counseling, anxiety reduction, and education of stuttering therapy improvements included increased self-confidence in being able to “control” their stuttering and clients were more participatory in communication situations. She concluded that often in neurogenic stuttering therapy, SLPs have achieved success in using similar treatment techniques as with developmental stuttering and often a combination of easy onsets, rhythmical speech, and slow speech rate, but often other therapy approaches are used to supplement treatment.

**Reported collaboration with neurogenic stuttering.** According to the inconclusive findings of Ludlow and Loucks (2003), Tani and Sakai (2010), and Theys et al. (2007), in regards to the neural etiology of neurogenic stuttering as well as its reported co-occurring disorders and histories of stroke, TBI, and neurodegenerative diseases, it would seem important to SLPs in their assessment and treatment plans with individuals with neurogenic stuttering to collaborate with other health professionals when it comes to a case history including stroke, TBI, or neurodegenerative disease. However, 20 out of 38 of participants in this study reported to never have referred an individual with sudden onset of neurogenic stuttering to another health professional. Thirteen SLPs who participated in the current study reported to having referred a client to a medical doctor and 12 reported having referred a client to a mental health professional.

**Reported characteristics observed in clients with psychogenic stuttering.** Results of this study reveal similarities between Manning's (2010) clinical characteristics and participants' reports of their experiences with psychogenic stuttering. Manning (2010) reported that individuals with psychogenic stuttering most likely suffer from some type of diagnosed psychopathology. Twenty-two participants out of the 28 who reported that they had experience with psychogenic stuttering also reported their clients having a diagnosis of anxiety, 16 reported seeing a diagnosis of depression, 17 reported Post-Traumatic Stress Disorder (PTSD), 6 reported that their client had a history of previous military combat, and only 3 reported observing no previously diagnosed psychopathologies in their client with psychogenic stuttering. Participant's responses align with Manning's (2010) observations that clients who present with psychogenic

stuttering will most likely have a previous diagnosis of psychopathology prior to onset of their stuttering.

Of the 29 participants who reported experience with psychogenic stuttering, the most commonly reported characteristics observed were history of psychological or emotional issues, intermittent or situation-specific patterns of disfluency, lack of improved fluency when using fluency-enhancing techniques, a pattern of increased fluency during less difficult speaking tasks, unusual struggle behaviors not associated with disfluent moments, unusual grammar usage. Less commonly reported of Manning's (2010) characteristics by the surveyed SLPs were quick improvement following disclosure of a traumatic or emotional event, rapid responses to trial therapy, persistent and worsening disfluency during successive reading of a passage, and repetitions of almost all phonemes with secondary behaviors.

**Reported assessment protocols with psychogenic stuttering.** Previous literature on assessment approaches to psychogenic stuttering often relies heavily on a diagnosis of psychopathology (Baumgartner, 1999; Deal, 1982; The results of this study revealed that SLPs in this study report collecting and analyzing speech samples, using case histories, as well as assessing cognitive and affective components. In addition, eight participants noted in an open-ended response that they often consult parents and counselors who know the client more closely as well as use informal assessments of the client's attitudes and beliefs to aid in their decision-making. It can be concluded that the majority of SLPs rely on family/patient interviews as well as do a thorough investigation into the patient's case history to look for signs of psychopathology or signs of neural etiology that could either lead to another possible diagnosis or confirm the presence of psychogenic

stuttering. The three exceptions to this conclusion per the results of this survey could account for psychopathologies that exist but are unknown to the SLP or the individual with psychogenic stuttering due to a lack of medical diagnosis and evaluation (Manning, 2010). These results could also be related to a statement made by Baumgartner (1999) about a study done by Roth, Aronson, & Davis (1989) that the presence of psychopathology does not automatically confirm the presence of psychogenic stuttering as in their study neurological signs were often co-occurring with a diagnosed psychopathology. One participant in our study did mention using motor speech examinations in their open-ended response, which matches what Roth, Aronson, and Davis (1989) recommend using in order to rule out motor speech disorders or possible neurogenic stuttering as well.

**Reported treatment approaches with psychogenic stuttering.** SLPs with experience with individuals with psychogenic stuttering reported that counseling, slower rate of speech, controlled phrasing (pausing), and desensitization strategies have been on average between “3=beneficial” and “4=very beneficial”. Baumgartner (1999) stated that client counseling and interview along with trial therapy have revealed the best prognosis for improvement in individuals with psychogenic stuttering. These results are in agreement with Baumgartner (1999) in that the SLPs surveyed use counseling along with some therapy previously listed above with clients with psychogenic stuttering. However, similar to neurogenic stuttering, no participants rated these techniques as “5 = most beneficial” in therapy.

**Reported collaboration with psychogenic stuttering.** Previous research) reveals the importance of identifying a psychopathology in clients with sudden onset of stuttering (Baumgartner, 1999; Deal, 1982; Roth, Aronson, & Davis, 1989). Results of this study have labeled it as an important diagnostic marker for many SLPs with experience with this population. However, not all SLPs reported that they have referred their client with psychogenic stuttering to a mental health professional. The majority of participants from this study who responded to this question (20 out of 35) have reported to refer to a mental health professional, while still 15 reported to have never referred their clients with psychogenic stuttering to a mental health professional.

### **Conclusion**

Data from the current study revealed that participants who indicated experience with neurogenic and psychogenic stuttering reported similar clinical characteristics as those documented in the literature available (Manning, 2010; Helm-Estabrooks, 1999). In addition, these SLPs are using a wide array of assessments in addition to traditional fluency assessments as part of their battery to aid in differential diagnosis of neurogenic stuttering and psychogenic stuttering from other motor speech disorders and aphasia (Baumgartner, 1999; Roth Aronson, & Davis, 1989). Participants also indicated that extensive case histories from clients proved to be more helpful in determining neurological etiology or psychopathology in participants' evaluations of individuals with either neurogenic or psychogenic stuttering. Participants in the current study reported that patient counseling, controlled phrasing (pausing), slower rate of speech, and desensitization proved to be beneficial to their clients with neurogenic stuttering as well as with those clients with psychogenic stuttering. However, they were not rated as being

most beneficial. More than half of the SLPs reported never having referred a client with neurogenic stuttering to another health professional. However, more than half of the SLPs reported referring a client with psychogenic stuttering to a mental health professional. According to the results of this study, participants perceived themselves as having more knowledge and experience with neurogenic stuttering than psychogenic stuttering based on a Likert scale.

### **Clinical Implications**

The findings of this study have significant clinical implications for the field of speech-language pathology. Specifically, the incidence and prevalence of neurogenic and psychogenic stuttering, implications for graduate training programs, beneficial assessment and treatment protocols for current practitioners, interdisciplinary collaboration in regards to assessment and treatment planning, and avenues for future research in acquired stuttering disorders.

There remains a lack of research and literature available that indicates the incidence and prevalence of neurogenic and psychogenic stuttering, but most research previously cited in this study refer to these communication disorders as “rare.” It is important to note that in the current study’s results, 50% of the 38 SLPs who answered this survey question reported having treated between one and five clients with acquired stuttering while the other 50% reported having treated six or more clients with acquired stuttering. Currently, 16 participants reported that they are treating clients with acquired stuttering on their caseloads. More participants of the current study indicated providing clinical service to clients with neurogenic stuttering than psychogenic stuttering.

Neurogenic and psychogenic stuttering was most often indicated in the current literature as a late-onset adult communication disorder. However, participants in the current study observed neurogenic or psychogenic stuttering in preschool children, school-aged children, and adolescents. Current practitioners in the field need to be aware regardless of the population and/or setting they currently work in that according to these participants individuals of all ages were observed with neurogenic or psychogenic stuttering.

Participant responses provide support for using an eclectic approach to diagnosis as well as treatment of neurogenic and psychogenic stuttering. The results of this study reveal the importance of looking at the presenting communication problem as a whole and treating each of its symptoms systematically. Participants in this study reported aphasia and apraxia as the two most often co-occurring communication disorders within their clients with neurogenic stuttering. Based on the results of the current study, some SLPs indicated that best practice in regards to diagnosing neurogenic and psychogenic stuttering may include using a battery of assessments for motor speech disorders, aphasia, and cognitive disorders in addition to traditional fluency assessment instruments.

Similarly, the results of the current study indicated that these SLPs are using fluency-enhancing techniques with neurogenic and psychogenic stuttering, but none indicated these techniques as most beneficial. It could be that these SLPs are more drawn to using fluency-enhancing techniques because they have more experience with using them with developmental stuttering. However, the SLPs ratings in this study revealed that using fluency-enhancing techniques are not the most beneficial for their clients with neurogenic or psychogenic stuttering. Therefore, it may be best practice for future and

current practitioners to supplement these fluency-enhancing techniques with other techniques such as counseling, fluency-modification techniques, or motor speech techniques and consider each technique using trial and error.

Considering counseling was rated by SLPs as most beneficial in treating neurogenic and psychogenic stuttering, graduate training programs in communication disorders should educate students in counseling techniques and strategies by either imbedding it into the current curriculum or offering it as a separate class. In addition, students should be educated on referral sources and how to collaborate with other health professionals in regards to this population as some, but not all participants indicated in this study that they do so in their experience with neurogenic and psychogenic stuttering. Similarly, the participants of the current study revealed many co-occurring disorders, psychopathologies, and the variety of neural etiologies and often reported taking a multidisciplinary approach in diagnosing and treating neurogenic and psychogenic stuttering.

### **Limitations**

After completing this research study, there were several factors that could have potentially impacted the results. (1) The study revealed a smaller than expected sample size. Some participants skipped or did not respond to certain questions, which was allowed but investigators have no way of knowing why. (2) There was a limited opportunity for open-ended responses to questions, which may have revealed more specific information about the clinical practices of SLPs. (3) There was also an unexpected factor in the survey format that was not originally accounted for in that



participants were given the option to choose “Other” and provide an open-ended response. This was unexpected and was automatized by the web-based survey software. (3) The survey did not assess SLP’s perceived benefits of other treatment techniques outside of traditional fluency techniques. (4) The survey did not specifically take into account the possibility of co-occurring communication disorders such as aphasia and apraxia and how that may have affected the ratings of beneficial treatment techniques. (5) Assessment batteries and treatment approaches may have varied based on individual characteristics of the participants’ clients.

### **Avenues for Future Research**

Research aimed at illustrating the long-term benefits and longitudinal effects of those beneficial treatment techniques would further illustrate evidence-based practice with neurogenic and psychogenic stuttering. In addition, more research on the other types of acquired stuttering that are assumingly less common is needed (i.e., Pharmacogenic, malingering, and military combat-related stuttering). Research studies which include larger sample sizes need to be conducted to further investigate and document the incidence and prevalence of neurogenic and psychogenic stuttering. Subsequent research could further explore the theory behind certain lesion sites being linked to certain types of disfluencies in acquired stuttering disorders.

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APPENDIX A:  
Survey Instrument & Informed Consent

## Identifying Speech-Language Pathologists' Current Perceptions and Practice Patterns Related to Neurogenic and Psychogenic Stuttering

### Informed Consent

1 / 2

50%

You are being invited to take part in this research study, Institutional Review Board Approval Protocol Number 14-215, because you are a licensed speech-language pathologist who is affiliated with the American Speech-Language-Hearing Association (ASHA) and the American Board of Fluency and Fluency Disorders.

You should not participate in this study if you are not a native English speaker, do not have at least a Master's degree in Communication Disorders, or if you do not have any experience with providing clinical services to an individual with neurogenic and psychogenic stuttering.

By agreeing to participate in this study, you will be asked to electronically complete this brief survey, which should take approximately 15 minutes. You may complete the survey any time of day from your home or office. You may complete the survey only one time. Once you complete the survey you may submit it by selecting the "Submit" button after completing all of the questions. This information will then be automatically sent to the Primary Investigator, Mary Griffith. Your responses to the survey will be anonymous and only identifiable by a randomly assigned number used for data collection purposes.

The purpose of this study is to learn the current perceptions of SLPs who are diagnosing and treating people with psychogenic and neurogenic stuttering. Second, what do SLPs observe as the typical characteristics of neurogenic and psychogenic stuttering. Third, to identify the diagnostic measures, treatment strategies, and techniques that are currently being used by SLPs in providing services for clients with psychogenic or neurogenic stuttering.

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the primary investigator, Mary Griffith at [mary\\_griffith39@mymail.eku.edu](mailto:mary_griffith39@mymail.eku.edu) or Dr. Charles Hughes Ph.D. M.A. CCC-SLP at [Charles.Hughes@eku.edu](mailto:Charles.Hughes@eku.edu). If you have any questions about your rights as a research volunteer, contact the staff in the Division of Sponsored Programs at Eastern Kentucky University at 859-622-3636.

By clicking the next/continue button, you are providing your consent to take part in this study.

Next



## Demographic Information

2 / 2

100%

**1. How many years of experience do you have working as a speech-language pathologist?**

- 0-5
- 6-10
- 11-15
- More than 15 years

**2. In what setting have you or are you currently providing clinical services to clients with neurogenic and psychogenic stuttering?**

- Hospital
- Private practice
- Rehabilitation Center
- School

**3. What age range were the clients you have seen with neurogenic or psychogenic stuttering? Check all that apply.**

- Preschool
- School-age
- Adolescent
- Adults

**4. What is the highest academic degree you have earned?**

- Master's Degree
- Doctoral Degree

**5. Have you obtained the certificate of clinical competence through the American Speech-Language-Hearing Association?**

- Yes
- No

**6. Are you a Board Certified Specialist in Fluency (formally known as Board Recognized Specialist in Fluency Disorders)?**

- Yes
- No

**7. Have you ever provided clinical services for a client(s) with acquired stuttering?**

- Yes
- No

**8. How many client(s) have you provided clinical services for acquired stuttering?**

- 1-5
- 6-10
- 10+

**9. Are you currently treating client(s) with acquired stuttering?**

- Yes
  - No
-

**10. What type of acquired stuttering did your client(s) have? Please check all that apply.**

- Neurogenic Stuttering
- Psychogenic Stuttering
- Pharmacogenic Stuttering
- Malingering Stuttering
- I have not provided clinical services to someone with acquired stuttering.

**11. Please rate your knowledge of each of these acquired stuttering disorders based on a Likert scale from 1-5 (1 = being no knowledge, 2 = a little knowledge, 3 = some knowledge, 4 = knowledgeable, 5 = very knowledgeable).**

	1=No knowledge	2=A little knowledge	3=Some knowledge	4=Knowledgeable	5=Very knowledgeable
Neurogenic Stuttering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Psychogenic Stuttering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Malingering Stuttering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pharmacogenic Stuttering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**12. Please rate your level of experience with each of these acquired stuttering disorders in order of most experience to least experience based on a Likert scale from 1-5 (1 = being no experience, 2 = a little experience, 3 = somewhat experienced, 4 = experienced, 5 = very experienced).**

	1=No experience	2=A little experience	3=Somewhat experienced	4=Experienced	5=Very experienced
Neurogenic Stuttering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Psychogenic Stuttering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Malingering Stuttering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pharmacogenic Stuttering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Neurogenic Stuttering

**13. In your observations of your client(s) with neurogenic acquired stuttering, did they report a case history that included any of the following medical diagnosis? Please check all that apply.**

- Stroke
- Traumatic Brain Injury
- Neurodegenerative Disease
- Military combat experience
- None of these
- I have never seen anyone with neurogenic stuttering.

**14. What co-occurring disorders or diseases have you observed in working with individuals with neurogenic acquired stuttering? Check all that apply.**

- Aphasia
- Apraxia
- Parkinson's Disease
- Alzheimer's Disease
- Brain Tumor
- Dementia
- I have never seen someone with neurogenic stuttering.

Other (please specify)

**15. What formal or informal diagnostic assessment instruments have you used to diagnose a client with neurogenic stuttering? Check all that apply.**

- Collection and disfluency analysis of speech sample.
- Case History Form
- Assessment of cognitive and affective components
- Other (please specify)

**16. In your observations of your clients with neurogenic stuttering were any of the following summarized characteristics present? Check all that apply. (Manning, 2010)**

- No reported previous history of disfluency
- Lack of improved fluency when using fluency-enhancing techniques.
- Consistent disfluent productions even during automatic speech tasks.
- Stuttering occurs on middle and final syllables of words.
- A decrease in stuttering moments with repeated readings of a passage. (adaptation effect)
- Secondary behaviors
- Fluency varies across speaking tasks and situations.
- Negative affective and cognitive responses (negative feelings and thoughts toward his/her disfluency)

**17. What types of therapeutic techniques have you used with individuals with neurogenic stuttering? Check all that apply.**

- Easy Onsets
- Controlled Phrasing (Pausing)
- Slower Rate of Speech
- Pacing Board
- Delayed Auditory Feedback
- Pseudostuttering (voluntary stuttering)
- Desensitization
- Counseling
- I have not seen a client with neurogenic stuttering.
- Other (please specify)

**18. How beneficial were these techniques for an individual with neurogenic stuttering? Please rate each on a Likert scale 1-5 (1 = not beneficial, 2 = somewhat beneficial, 3 = beneficial, 4 = very beneficial, 5 = most beneficial).**

	1=Not beneficial	2=Somewhat beneficial	3=Beneficial	4=Very beneficial	5=Most beneficial	N/A
Easy Onsets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Controlled Phrasing (Pausing)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slower Rate of Speech	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pacing Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delayed Auditory Feedback	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pseudostuttering (voluntary stuttering)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Desensitization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Counseling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**19. Have you ever referred a client with neurogenic stuttering to a health professional? Please check all that apply.**

- Mental Health Professional
- Medical doctors
- I have never referred this type of client to any other health professional.
- I have not seen a client with neurogenic stuttering.

## **Psychogenic Stuttering**

**20. In your observations of your client(s) with psychogenic acquired stuttering, did they report a case history that included any of the following medical diagnosis? Please check all that apply.**

- Anxiety
- Depression
- Post-Traumatic Stress Disorders
- Involved in military combat
- None observed.
- I have never seen someone with psychogenic stuttering.

**21. What formal or informal diagnostic measurements have you used to diagnose a client with psychogenic stuttering? Check all that apply.**

- Collection and disfluency analysis of speech samples.
- Case History Form
- Assessment of cognitive and affective components.
- Other (please specify)



**22. In your observations of your clients with psychogenic stuttering were any of the following characteristics summarized present? Check all that apply. (Manning, 2010)**

- Client indicated a history of psychological or emotional issues.
- Lack of improved fluency when using fluency-enhancing techniques.
- Quick improvement following disclosure of a traumatic or emotional event.
- Rapid response to trial therapy.
- Pattern of increased disfluency during less difficult speaking tasks.
- Disfluency persists or becomes more severe in successive readings of a passage.
- Unusual struggle behaviors not associated with disfluent moments.
- Unusual grammar usage.
- Repetitions of almost all phonemes with secondary behaviors.
- Intermittent or situation-specific patterns of stuttering episodes.

**23. What therapeutic approaches have you used with individuals with psychogenic stuttering? Check all that apply.**

- Easy Onset
- Controlled Phrasing (Pausing)
- Slower Rate of Speech
- Pseudostuttering (voluntary stuttering)
- Desensitization
- Delayed Auditory Feedback
- Counseling
- I have never seen anyone with psychogenic stuttering.
- Other (please specify)

**24. How beneficial were these techniques for an individual with psychogenic stuttering? Please rate each on a Likert scale 1-5 (1 = not beneficial, 2 = somewhat beneficial, 3 = beneficial, 4 = very beneficial, 5 = most beneficial).**

	1=Not beneficial	2=Somewhat beneficial	3=Beneficial	4=Very beneficial	5=Most beneficial	N/A
Easy Onset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Controlled Phrasing (Pausing)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slower Rate of Speech	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pseudostuttering (voluntary stuttering)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Desensitization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delayed Auditory Feedback	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Counseling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**25. Have you ever referred a client with psychogenic acquired stuttering to a mental health professional?**

- Yes
- No

Appendix B: SLP Recruitment Letter



Eastern Kentucky University

Participants Wanted for a Research Study

**Identifying Speech-Language Pathologists' Current Perceptions and Practice  
Patterns  
Related to Neurogenic and Psychogenic Stuttering**  
IRB Protocol Number: 14-215

The purpose of the study is to research how speech-language pathologists are currently identifying and treating individuals with neurogenic stuttering and psychogenic stuttering. Voluntary participation will include completing a web-based survey.

*Link to survey*

Participants must be a native English speaker, have attained at least a Master's Degree in Communication Disorders, and have some experience with providing clinical services to at least one individual with neurogenic or psychogenic stuttering.

*To learn more about this research, contact the principal investigator:  
mary\_griffith39@mymail.eku.edu*

*This research is conducted under the direction of Charles Hughes Ph.D., College of  
Education*

## Appendix C: Tables

Table C. 1. Demographic Information for SLPs Who Have Experience with Neurogenic and Psychogenic Stuttering - Number of Years of Experience as a SLP.

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<u>Question</u>	<u>Number (n=)</u>	<u>Percentage</u>
How many years of experience do you have working as a speech-language pathologist?		
0-5	3	7.69%
6-10	3	7.69%
11-15	5	12.82%
More than 15 years	28	71.79%
Total	39	100%

Table C. 2. Demographic Information for SLPs Who Have Experience with Neurogenic and Psychogenic Stuttering – Settings Within Which SLPs Have Provided Services to Clients With Neurogenic and Psychogenic Stuttering.

---

<u>Question</u>	<u>Number (n=)</u>	<u>Percentage</u>
In what setting have you or are you currently providing clinical services to clients with neurogenic and psychogenic stuttering?		
Hospital	12	30.77%
Private practice	16	41.03%
Rehabilitation Center	15	38.46%
School	5	12.82%
Total	39	100%

Table C. 3. Demographic Information for SLPs Who Have Experience with Neurogenic and Psychogenic Stuttering –Age ranges of Client SLPs Have Provided Services to With Neurogenic and Psychogenic Stuttering.

<u>Question</u>	<u>Number (n=)</u>	<u>Percentage</u>
What age range were the clients you have seen with neurogenic or psychogenic stuttering? Check all that apply.		
Preschool	7	18.24%
School-age	12	31.58%
Adolescent	15	39.47%
Adults	34	89.47%
Total	38	97.43%



Table C. 4. SLPs reported clinical characteristics of neurogenic stuttering.

<u>Question</u>	<u>Number (n=)</u>	<u>Percentage</u>
In your observations of your clients with neurogenic stuttering were any of the following summarized characteristics present? Check all that apply. (Manning, 2010)		
No reported previous history of disfluency	34	89.47%
Lack of improved fluency when using fluency-enhancing techniques	20	52.36%
Consistent disfluent productions even during automatic speech tasks	21	55.26%
Stuttering occurs on middle and final syllables of words.	17	44.74%
A decrease in stuttering moments with repeated readings of a passage (adaptation effect)	10	26.32%
Secondary behaviors	18	47.37%
Fluency varies across speaking tasks and situations	19	50.00%
Negative affective and cognitive responses (negative feelings and thoughts toward his/her disfluency)	26	68.42%
Total	38	97.43%

Table C.5. SLPs reported diagnostic assessment for neurogenic stuttering.

<u>Question</u>	<u>Number (n=)</u>	<u>Percentage</u>
What formal or informal diagnostic assessment instruments have you used to diagnose a client with neurogenic stuttering? Check all that apply.		
Collection and disfluency analysis of speech sample	37	97.37%
Case history form	36	94.74%
Assessment of cognitive and affective components	34	89.47%
Other (please specify)	14	36.84%
Input from others in the person's environment about changes in stuttering/speech/impact of these		
Motor speech examination		
Response to fluency management strategies		
Medical records (MRI, CT scans)		
Various types of tasks (automaticity, reading, medical reviews, consistency in tasks, adaptation)		
SSI-4		
ABA, WAB, and Robertson to rule out aphasia/motor speech		
OASIS		
Paper and pencil tools to assess attitudes/beliefs		
Speech-language voice assessment		
consultation with other practitioners;		

Table C.5. (continued)

<u>Question</u>	<u>Number (n=)</u>	<u>Percentage</u>
interview with family members		
Other informal tasks, dependent on client's neurological disorder		
Same as for developmental stuttering, SSI-4, OASES, BAB, WASSP, 0-10 scale for goals and where are at now adjust according to deficits due to head injury etc.		
Total	38	97.43%

Table C. 6. SLPs reported beneficial therapeutic techniques for neurogenic stuttering.

<u>Question</u>	<u>Number of Participants (n=)</u>	<u>Weighted mean rating (m=)</u>
How beneficial were these techniques for an individual with neurogenic stuttering? Please rate each on a Likert scale 1-5 (1 = not beneficial, 2 = somewhat beneficial, 3 = beneficial, 4 = very beneficial, 5 = most beneficial).		
Easy Onsets	37	2.69
Controlled Phrasing (pausing)	36	3.07
Slower Rate of Speech	34	3.16
Pacing Board	32	2.59
Delayed Auditory Feedback	27	2.14
Pseudostuttering (voluntary stuttering)	28	2.50
Desensitization	30	3.00
Counseling	36	3.45
Total	39	100%

Table C.7. SLPs referral of neurogenic stuttering clients to other health professionals.

<u>Question</u>	<u>Number of participants (n=)</u>	<u>Percentage</u>
Have you ever referred a client with neurogenic stuttering to a health professional? Please check all that apply.		
Mental Health Professional	12	31.58%
Medical doctors	13	34.21%
I have never referred this type of client to any other health professional.	20	52.63%
I have not seen a client with neurogenic stuttering.	2	5.26%
Total	38	97.43%

Table C. 8. SLPs reported clinical characteristics of psychogenic stuttering.

<u>Question</u>	<u>Number (n=)</u>	<u>Percentage</u>
In your observations of your clients with psychogenic stuttering were any of the following summarized characteristics present? Check all that apply. (Manning, 2010)		
Client indicated a history of psychological or emotional issues	24	82.76%
Lack of improved fluency when using fluency-enhancing techniques	18	62.07%
Quick improvement following disclosure of a traumatic or emotional event	8	27.59%
Rapid response to trial therapy	9	31.03%
Pattern of increased disfluency during less difficult speaking tasks	14	48.28%
Disfluency persists or becomes more severe in successive readings of a passage	8	27.59%
Unusual struggle behaviors not associated with disfluent moments	13	44.83%
Unusual grammar usage	11	37.93%
Repetitions of almost all phonemes with secondary behaviors	8	27.59%
Intermittent or situation-specific patterns of stuttering episodes	21	72.41%
Total	29	74.35%

Table C.9. SLPs reported diagnostic assessments for psychogenic stuttering.

<u>Question</u>	<u>Number (n=)</u>	<u>Percentage</u>
What formal or informal diagnostic assessment instruments have you used to diagnose a client with psychogenic stuttering? Check all that apply.		
Collection and disfluency analysis of speech sample	29	100.00%
Case history form	28	96.55%
Assessment of cognitive and affective components	26	89.66%
Other (please specify)	8	27.59%
Consult parents and counselors		
Review of file/discussion of others in the same situations who see the client more frequently		
Motor speech examination		
Interviews, other reports		
SSI-4		
Paper and pencil tools to assess attitude/beliefs		
Total	29	74.35%

Table C. 10. SLPs reported beneficial therapeutic techniques for psychogenic stuttering.

<u>Question</u>	<u>Number of participants (n=)</u>	<u>Weighted Mean (m=)</u>
How beneficial were these techniques for an individual with psychogenic stuttering? Please rate each on a Likert scale 1-5 (1 = not beneficial, 2 = somewhat beneficial, 3 = beneficial, 4 = very beneficial, 5 = most beneficial).		
Easy Onsets	28	2.59
Controlled Phrasing (pausing)	27	3.22
Slower Rate of Speech	25	3.38
Pseudostuttering (voluntary stuttering)	23	2.40
Desensitization	25	3.09
Delayed Auditory Feedback	19	1.25
Counseling	31	3.83
Total	33	



Table C. 11. SLPs referral of psychogenic stuttering clients to a mental health professional.

<u>Question</u>	<u>Number of participants (n=)</u>	<u>Percentage</u>
Have you ever referred a client with psychogenic stuttering to a mental health professional?		
Yes	20	57.14%
No	15	42.86%
Total	35	89.74%