Aphasia & Stutter Therapy:

An Ailment Not to be Treated

By

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ABSTRACT

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This work demonstrates the history of two common speech and communication disorders: aphasia and stuttering. Once considered incurable diseases, these conditions have since generated rich rehabilitation practices and accompanying schools of thought. The first part of the thesis takes up adult aphasia, excluding cases involving speech and communication disorders due to other mental illnesses. The second half of this project conveys the history of stuttering. The majority of the modern cases analyzed in this thesis focus on developmental stuttering in children; although, different forms of stuttering are embedded in the progression of the therapy history. Each chapter includes a section on modern Speech and Language Pathology (SLP) practices, outlining the benefits of poetry therapy for each disability. Given that aphasia and stuttering are two different conditions, this section focuses on the potential benefits of poetry therapy for both respective fields of study. Poetry analysis of patients with aphasia and stutters shows how a new form of therapy not only helps their speech, but returns their independence. Following this analysis, I include original poems that aim to describe the people and experiences I have encountered through my work at a rehabilitation hospital and as a teacher assistant for children with disabilities, as well as personal poems inspired by my role as caretaker for my little brother with down syndrome. This project, then, serves as a cohesive manifestation of diverse discourses, both personal and clinical, surrounding aphasia and stuttering in the field of speech language pathology.

Dedicated to my dad and little brother AJ

for inspiring me to become a Speech Language Pathologist

And to celebrate the profession that has and will

continue to help many find their voice again.

Table of Contents

"Lord open my breast," said Moses,

"and do Thou ease for me my task,

Unloose the knot upon my tongue,

that they may understand my words."

—Koran, 20:26-29

Introduction

The past six years, I had immersed myself in the field of Speech Language Pathology (SLP) in various ways. I cared for my baby brother with down syndrome, which is where I was introduced to the magic of speech therapy: I worked as a physical, occupational, and speech therapy aide at a rehabilitation hospital where I was exposed to vast conditions and specialties of SLP. I continue to work as a teacher's assistant for children (preschool-school age) with disabilities, which exposed me more to developmental language disorders. And throughout the years, a few of my dear friends suffered from strokes or traumatic brain injuries, resulting in their need for speech therapy. I set out on this adventure that became my project in hopes of not only learning more about the history of two common speech and communication disorders but also as a way to consolidate all the information and experiences I have gained. Language is such a complex and yet delicate privilege we possess. It is fair to assume that since man first spoke, speech disfluencies have existed, presenting themselves as simple repetitions to full disorders from head wounds. In order to represent the wide age range that SLP serves, I chose to research stuttering, which can occur at any age, and aphasia, which mostly occurs in older patients. Moreover, I use the term "patient" to refer to those with the speech disorder, but this is only to be used as a way to combat the stigma that patients are passive participants in their recovery. My experiences and love for literature and language led me to poetry therapy. I was disappointed to learn that not much has been done regarding the inclusion of poetry into speech rehabilitation. Thus, the pages that follow incorporate not only my take on poetry therapy but that of authorities throughout the history of aphasia and stuttering.

Chapter 1: A Brief History of Aphasia

Until the nineteenth and early twentieth centuries, the histories of aphasia therapy and stutter therapy were closely intertwined due to the limited knowledge and understanding of the physiological localization of brain functions as well as the psychological theories of the brain. This chapter focuses on the history of aphasia and the developments in aphasia therapy. Aphasia is a disorder of language following traumatic brain damage, more specifically lesions to the left cerebral hemisphere, that causes impairment in the production or comprehension of speech. It may also impair one's ability to read or write due to damaged processing at the phonological, morphological, lexical semantic, or syntactic level (Zumbansen and Thiel 2014). The history of Aphasia therapy can be broken down into six time periods: (1) Ancient Egypt (c. 2800 BCE-1300 BCE), (2) Ancient Greece and Rome (c. 400 BCE to c. 400 AD), (3) 15th and 16th century, (4) 17th and 18th century, (5) 19th century, (6) 20th century to the present. Each section will cover the major advancements in knowledge of aphasia as well as highlight the important aphasiologists and their respective contributions to aphasia therapy. The last sub-section touches upon a more recent form of therapy—poetry therapy, which is a new form of therapy emanating from Melodic Intonation Therapy in the 1970's. This section discusses benefits and issues regarding this form of insufficiently researched therapy along with examples of therapeutic poetry, both original and by aphastic patient Leonard Zion.

Ancient Egyptian Descriptions (2800 BCE-1300 BCE)

The very first written record of references to aphasia originates from the Egyptian city of Luxor; the text was found in 1862, but it was written by the Egyptian surgeon Imhotep around 2800 BCE (Howard & Hatfield 1987). The text was written in hieratic script, a quicker cursive form of hieroglyphics that was mostly used by priests. It was found in Edwin Smith's surgical

papyrus that contained descriptions of forty-eight individuals with physical injuries, including twenty-seven cases of head trauma caused by fractures of the skull. There seemed to be an association made between head injuries and "loss of speech" in these case studies (Prins & Bastiaanse 2006). Case 20 is a description of a man with a head wound in his temple that was perforating his temple bone, "and he speak not to thee...this is an ailment not to be treated...Now when thou findest that man speechless, his relief shall be sitting; soften his head with grease, and pour milk into both his ears" (Prins & Bastiaanse 2006). Some translations suggest that the Egyptian word for speechless means "he is silent in sadness and without speech" (Howard & Hatfield 1987). Speechlessness was a disease to be minimally treated at this time with grease and milk.

This being the very first aphastic phenomena recorded, it is still unclear if the speechlessness is due to language, articulation, fluency, or difficulties with voice. Voice refers to the phonetic utterance of sounds and the process of activating the vocal cords. Articulation is the process of making sounds using the mouth, lips, and tongue. Language refers to the words we use and the ideas behind them and what they represent. Fluency is the pace and rhythm at which we speak, including when and why we take pauses. The ambiguous nature of these descriptions is, unfortunately, a common theme throughout aphasia's history. In modern medicine, aphasiologists and speech language pathologists know how imperative these distinctions are to logopedics.

Despite the lack of specificity, this example highlights the idea of the causal connection between "speechlessness" and brain damage. Imhotep hints at a vague understanding of the brain's control over movement of the body and even makes consistent notes on which side of the body is injured, but it is unclear whether this Egyptian physician fully grasped the meaning of his

observations. However, other parts of the papyrus text suggest that this speechlessness is caused by a spiritual outside force like “the breath of an outside God or death” (Prins & Bastiaanse 2006). Since Egyptians believed “the heart to be the central organ of the soul responsible for feeling, thinking, and other cognitive functions,” it is unlikely that they attributed language to the brain (Prins & Bastiaanse 2006). During mummification, the heart was preserved with the body while the brain was scooped out through the nostrils and thrown away.

The next available aphastic record is found in a Hittite text in cuneiform from Mesopotamia. This clay tablet refers to a ritual for King Mursilis II, who ruled the Hittite empire from 1344 to 1320 BCE (Prins & Bastiaanse 2006). The main section, including the episode that led to his speech difficulties, describes what happened during a severe thunderstorm at night: “I became afraid and the speech faded away in my mouth and the words rose up with some difficulty...as the years came by and passed by, it happened that this matter repeatedly occurred in my dreams and the hand of God struck me during a dream and my mouth went askew” (Prins & Bastiaanse 2006). The exact cause of King Mursilis’ episode is unknown; although it is theorized that he had a nocturnal stroke, causing aphastic symptoms. This particular aphastic description did little for the advancement of knowledge in this field, but it is the only other documented reference from the earliest civilizations of this speech disorder.

Greek and Roman Descriptions 400 BCE to 400 A.D.

The two main physicians from classical antiquity who contributed the most to aphasiology are Hippocrates and Galen. The Hippocratic writings provide the earliest substantial body of recorded medical knowledge that has survived. Although the Hippocratic Corpus (400 BCE) does not contain enough detailed observations for us to be confident that true speech disorders were occurring, it includes references to speechlessness in addition to a variety of other

conditions—apoplexy, epilepsy, and different cerebral illnesses. Hippocratic physicians studied and observed the speech disorders resulting from stroke and epilepsy. They categorized the speech disorders under the terms *aphonos* and *anaudos*. However, since the meanings of the translations and words themselves have changed over time, it is unclear "whether the observed speech disorders refer to a disorder of language (aphasia), speech (dysarthria), or voice (dysphonia)" (Prins & Bastiaanse 2006). The case that most likely exhibits aphasia is of a pregnant woman who had a fever for three consecutive days. She experienced:

> Pain in the neck and in the head and in the region of the right collar-bone. Quickly she lost her power of speech, the right arm was paralyzed, with a convulsion after the manner of a stroke; completely delirious...Fourth day. Her speech was recovered but was indistinct (Howard & Hatfield 1987).

A major contribution came when the Hippocratic school distinguished between aphasia and anarthria (Benton 1965). Anarthria is the most severe form of dysarthria, which affects the muscles of the mouth that produce clear speech. They were aware that speechlessness was a consequence of damage to the brain and not the heart, as previously discussed in Egyptian practices. However, this was an unpopular opinion; Aristotle still "believed the heart to be responsible for movement, sensations, and feeling, and the only function of the brain is to cool the heat and passions of the heart" (Prins & Bastiaanse 2006). There were all the ingredients in the Hippocratic Corpus relating aphasia to a lesion of the left hemisphere, but there is no evidence that the correlation was made. Reports link temporary speechlessness following convulsions with paralysis of the tongue and the right side of the body. Additional cases point out wounds on the side of the head produce spasms in the opposite side of the body.

> And for the most part, convulsions seize the other side of the body; for if the wound be situated on the left side, the convulsions will seize the right side of the body; or if the wound be on the right side of the head, the convulsion attacks the left side of the body (Prins & Bastiaanse 2006).

The concepts of cerebral dominance for language and localizing aphasia to a lesion in the left hemisphere were not discovered until much later.

Claudius Galenus became the personal physician of Emperor Marcus Aurelius. Since he had the freedom and resources to conduct research, in the second century A.D., Galen developed a theory of the human brain function through experiments of vivisection with living animals. Such experiments were forbidden to practice on human bodies dead or otherwise. One of his experiments conducted on a pig showed that when he cut a few nerves in the throat, the pig continued to breathe but lost his ability to squeal. Challenging Aristotle's view, he found that the voice comes from the brain, not the heart. He coined the term "nerves of the voice" to refer to those which he severed (Prins & Bastiaanse 2006). In another set of experiments, Galen exposed a variety of animals' hearts to demonstrate the ability the animals maintained to cry and breathe. Whereas later in his experiments, he exposed the animals' brains. When pressure was applied to the brain, the animals lost their ability to breathe and/or cry. With his work, he localized the "soul" (i.e. cognition, perception, and memory) in the brain (Prins & Bastiaanse 2006). He considered the brain and the spinal cord the origin of the body's nerves giving movement to the body. "The brain is placed in the skull as a grand king in his castle, with as messengers and vassals all the senses gathered around him; this leads to the conclusion that this part must be the seat of the soul" (Prins & Bastiaanse 2006).

Another main contribution Galen made to aphasiology is his specific, consistent descriptions of stroke symptoms. He advocated that a stroke consisted of a loss in breathing, sensation, and mobility, which was caused by a buildup of phlegm, particularly black bile, "obstructing the flow of the psychic pneuma or animal spirits" (Benton, 1965). The ventricular system is where the animal spirits were stored and distributed to the nervous system, later elaborated by Bishop Nemwsius (c. AD 400). Other Greek and Roman physicians in the 1st and 2nd centuries A.D. made distinctions between impairment of speech and voice due to paralysis and other causes. The first allusion to alexia dates back to Roman times. This observation is by Valerius Maximus (c. 30 A.D.) of a man who "lost his memory for letters but for nothing else, after having been struck in the head by a stone" (Benton, 1965). The term "alexia" was not used until 1965 in Lhermitte and Ducarne's research of aphasiology. Alexia is when a patient has maintained the ability to write, but the ability to read is impaired. Aphastic alexia is equivalent to dysphastic dyslexia in which reading, writing, and other language modalities are impaired (Howard & Hatfield 1987). Plinius (AD 23-79) reported the same case and additionally the case of Messala Corvinus. Messala Corvinus, "the great Orator...forgot his own proper name" after an unspecified illness (Prins & Bastiaanse 2006). Soranus of Ephesos (AD 98-135) describes more symptoms of stroke in his treatise "on acute and chronic diseases" (Prins & Bastiaanse 2006). Along with paralysis, one might experience "trembling and indistinct speech and unmotivated pauses" (Prins & Bastiaanse 2006). Delving into paralysis, he observed that paralysis of the tongue causes impairment of the articulation in speech, and that such paralysis "may be distinguished from cases of loss of speech resulting from some other disease" where the tongue remains mobile (Prins & Bastiaanse 2006). This is one of the first cases where articulation is attributed to the tongue. Too often the work of less well-known physicians is overlooked. During

the Greek and Roman period and the succeeding centuries, two important notions of the nature of aphasia are researched and continuously disputed: first, the notion of the mnestic aspect of aphasia (that is, viewing aphasia as a disorder of memory for words); and second, as paralysis of the tongue.

There were not many advancements in aphasia during the middle ages. However, we know that certain treatments and beliefs persisted. Although many other physicians realized speech could be lost without paralysis to the tongue, treatment for tongue stimulation was practiced. Even when, as is clear from context, the tongue was mobile and the speech loss was ascribed to cerebral lesions, the patient was treated with "cauteries and blisters applied to the neck in the hope of stimulating the tongue" (Howard & Hatfield 1987). Cauteries are now used to seal and/or sterilize wounds; however, during this period, cauteries were used to blister and irritate parts of the body. More specifically, it is an application of a hot instrument or irritant to the skin (Howard & Hatfield 1987). Blistering refers to applying substances to the skin in order to cause "reddening and peeling of the skin, or the collection of fluid beneath it. This is intended to relieve congestion (accumulation of fluid) in the organs lying beneath the blister" (Howard & Hatfield 1987).

15th and 16th Century

The Renaissance was a productive time for aphasiology in matters concerning the first clear, brief references to as well as the localization of aphastic disorders. Due to Galen's work in neuropsychology, interest rose in the physiological localization of brain functions. This led to the theory of the three cerebral ventricles of the brain. Gregor Reisch first published a thorough description of each ventricle along with the first image depicting the size and location of said

ventricles. The frontal cavity was believed to be the seat of perception, phantasy, and imagination, connected to the sense organs by nerves. The middle ventricle is the seat of thought and judgement, and the posterior cavity is the seat of memory (Benton, 1965). There were four main contributions to aphasiology during the 15th and 16th centuries thanks to Antonio Guainerio (1481), Nicolas Massa (1558), Ambroise Paré (1509-1590), and Johann Schenck von Grafenberg (1585).

Antonio Guainerio was a famous professor at the University of Padua. He published his *Opera Medica* ("Medical Works") in 1481 which contained two of the earliest aphasic cases (Prins & Bastiaanse 2006): "I had under my care two old men, one of whom did not know more than three words [...] The other [...] rarely or never recalled the right name of anyone. When he summoned someone, he did not call him by name" (Prins & Bastiaanse 2006). We know from modern SLP in the first description the patient suffered from motor or Broca's aphasia, and we can gather from the second description that the second patient had anomia. Anomic aphasia (a.k.a amnesic aphasia) is a type of aphasia where the patient has a difficulty remembering content words such as nouns and names (Howard & Hatfield 1987). This impairment may only be confined to speech production, but word comprehension is an additional issue for some patients. Although they are unable to retrieve content words and there may be circumlocutions, they maintain proper function of other aspects of language such as repetition and grammar (Howard & Hatfield 1987). Antonio Guainerio believed these patients' speech disorders could be ascribed to the accumulation of too much phlegm in the posterior ventricle, and according to Guainerio "the organ of memory can retain little or nothing" (Prins & Bastiaanse 2006). Using his assumptions, even though they are incorrect from a modern standpoint, Guainerio was the first physician to explicitly localize aphastic disorders to a specific part of the brain.

It has been long accepted at this point that aphasia was due to brain injuries, but the developments during this the 15th and 16th century were of operative intervention. This was the first-time surgeons actively "sought to alleviate post-traumatic aphasia...thus we find a number of case reports in the 16th century describing the cure of aphasia after head injury by removal of bone fragments" (Benton 1965). Nicolas Massa was an anatomist who published a series of his Medical Letters in 1558 wherein he describes the case of a young man named Marcus Goro. Goro suffered from a sharp spear point in the head and is consequently unable to speak for eight days. His halberd injury "resulted in a fracture of the skill and damage to the meninges and the brain substance as far as the base of the skull" (Howard & Hatfield 1987). Massa was called in eight days post-injury. During that time, other surgeons attempted operating to no avail. The doctors were convinced that there was no bone fragment in the brain substance. Massa disagreed, believing the bone was lodged in the brain. Massa describes his operation:

> Since the doctors declared that they had seen no bone [in the wound] I concluded that the reason of the loss of voice was that part of the bone was lodged in the Brain. I took an instrument from a certain surgeon who was in attendance and extracted the bone from the wound, whereupon the patient began to speak at once, saying: "Praise God, I am cured." (Prins & Bastiaanse 2006)

Because of the vague description of the nature of his symptoms, it is unclear if the loss of voice of the handsome young man was due to traumatic aphasia or anarthria. Anarthria is the most severe form of dysarthria which is a disorder of articulation due to either "a defect in the organs of articulation (i.e. mouth, tongue, larynx, etc.) or, more commonly in aphastic patients, by impairment to the nerves supplying the organs of articulation" (Howard & Hatfield 1987). There are a few different types of dysarthria recognized that depend on the specific muscle movement

deficits for each diagnosis. Because of the spontaneous recovery of speech, Massa's patient most likely was suffering from anarthria.

Johann Schenck von Grafenberg (1585) is credited as the first to tacitly make the distinction between a disorder of language (aphasia) and a disorder of speech (dysarthria), thus appreciating the essential nature of aphasia. He understood that aphasia was not due to paralysis of the tongue. He was a prominent German, medical scholar of the 16th century making a clear distinction that aphasia could present as a "high-level behavior disorder as well as a motor disorder due to paralysis of the tongue" (Benton 1965). In 1585, this physician published his book *Observationes medicae de capite humano* ("Medical observations on the human head") (Prins & Bastiaanse, 2006). It collected clinical observations ranging from ancient descriptions to those of his colleagues. Quite a bit of these observations were cases resulting from brain damage. As an example, one of the more contemporary cases reported: "I have observed in many cases of apoplexy [...] and similar major diseases of the brain that, although the tongue was not paralyzed, the patient could not speak because, the faculty of memory being abolished, the words were not produced" (Prins & Bastiaanse 2006). A colleague observed this patient, but Grafenberg is still accredited as the first to implicitly make the differentiation between aphasia as a behavioral disorder affecting language and memory and a motor disorder affecting the tongue. The causal connection of aphasia and tongue paralysis persisted well into the 19th century. Some therapies to treat aphasia included bloodletting, placing plasters on the tongue, and simultaneously combining many different medicines.

Another physician to make clinical contributions to aphasiology is Mercuriale. In 1588, he described a case of alexia after the patient suffered a seizure. In this case study he noted "a truly astonishing thing; this man could write but could not read what he had written" (Benton

1965). He noted one of the patient's symptoms as partial loss of memory. Because of this occurrence, he supported the theory of cerebral localization.

One of the most humane surgeons of the Renaissance, Ambroise Paré (1509-1590) indirectly contributed to the study of aphasia through his new treatments to head wounds. The invention of firearms caused more complex and different types of wounds for surgeons. Common treatments for such head wounds included pouring boiling oil and water onto the open injury. This method was ineffective, painful, and dangerous. Paré concocted an alternative mixture of egg yolk, rose oil, and turpentine to shy away from the distressing boiling oil treatments (Howard & Hatfield 1987). His method proved mildly effective in at least two of his cases. After suffering a rapier wound to the "left parietal lobe, an although seeming well immediately afterwards developed a fever later 'and lost his speech'...The patient was bled and clysterised (given an enema) and the wound was opened to remove some diseased bone" (Howard & Hatfield 1987). The patient made a good recovery thereafter. The second patient was a page of the Marshall of Montjean. He had a lesion in his temporo-parietal junction from the impact of a stone to the head. To treat his "deafness" Paré performed a surgery in conjunction with his rose oil mixture. The page's health was restored even though his "deafness" remained. It is unclear if he experienced true deafness or an aphastic difficulty in language comprehension. Either way, Paré added to the recorded history of aphastic phenomena whilst finding gentler treatments.

17th and 18th Century

Reports from 1600-1700 contributed immensely to aphasiology because various characteristics and forms of aphasia were described in more detail. This time period gave way to understanding aphasia as a more comprehensive disorder. There were many scholars, physicians, and clinicians elucidating cases in further detail. However, the causes and treatments for the various forms of observed aphastic disorders were unknown. The case studies that follow are of a more clinical nature.

Theophile Bonet (1620-1689) was a French physician. He published his *Guide to the practical physician* in 1684 in London (Prins & Bastiaanse 2006). Bonet contributed to medicine in two specific ways; first, he assembled one of the first collections of autopsy reports. Secondly, taking after Galen, he dabbled in polypharmacy and made a medicine for apoplexy. Apoplexy is the term first used by Hippocrates to refer to "any sudden attack of paralysis or loss of sensation as a result of cerebral disease" (Howard & Hatfield 1987). Its term is synonymous with the modern stroke. Bonet published his expensive recipe for this miraculous medicine, some of which reads:

> A most secret and certain remedy against apoplexy is to take a lion' dung, powdered, two parts, pour spirit of wine till it be covered three fingers breath, let them stand in a vial stopped three days… Let them be steeped in the aforesaid spirit, then add as much of the best wine and six ounces of sugar candy, boil them in a pot till the sugar be melted. Put it up. Let the patient take a spoonful of it in wine, often in a day, for a whole month. In the paroxysm give a spoonful with Aqua Tiliae, and with the same water, rub the forehead, neck, temples and nostrils. (Prins & Bastiaanse 2006)

This elaborate remedy was only prescribed to the royal and wealthy. The Archduchess of Austria fancied this medicine frequently. At this time, treatment for stroke was based on the physician's imagination, as can be seen with Bonet's concoction. Similarly, aphasia treatments and causes were still unknown.

Another important aphasiologist, Johann Schmidt, recorded a case of alexia without agraphia sometime between 1673-1676. In this case, the 65-year-old male patient lost the ability to read while maintaining the ability to name things and write after a severe stroke. His patient "muttered a good deal but was incapable of expressing the feelings of his mind; he substituted one word for another so that his attendants had difficulty in determining what he wanted" (Prins & Bastiaanse, 2006). Alexia without agraphia, known as "pure alexia" in neo-classical terminology, is a rare acquired disorder due to damage in the visual word form area (VWFA) (Rupareliya, Naqvi, & Hejazi 2017). Schmidt differentiates, for the first time, paraphasia from simple motor aphasia. Paraphasia is the use of an inappropriate word in one's speech, either semantic or phonological in nature. An example of a semantic paraphasia would be if a patient incorrectly replaces one word with another (i.e. naming a DOG as "a cat"). A phonemic paraphasia would be when the incorrect substituted word audiologically resembles the target word (i.e. naming a DOG as "a dot" or "a dob"). It is important to note that phonological aphasia's can be real words or non-words (Howard & Hatfield 1987). Whereas, simple motor aphasia concerns speech production more so than comprehension. Unlike paraphasia, patients with motor aphasia experience non-fluent speech and some degree of dysarthria. It is broadly similar to the neo-classical Broca's aphasia, but is used to include all different types of non-fluent aphasia. Therapies used for rehabilitation of this patient included venesection (blood-letting), stinging enemas to induce sleeping faculties, and application of oils to the head, neck,

and nose (Howard & Hatfield 1987). After some time, the paralysis and the speaking difficulties improved greatly, but he reserved the severe alexia:

> He could not read written characters, much less combine them in any way. He did not know a single letter nor could he distinguish one from another. But it is remarkable that, if some name were given to him to be written, he could write it readily, spelling it correctly. However, he could not read what he had written even though it was in his own hand… No teaching or guidance was successful in inculcating recognition of letters in him. (Prins & Bastiaanse 2006)

His paper included a more detailed description of alexia than those previously found. Comparing two cases of alexia, he pointed out that the course of impairment varies from person to person, where the disability was unaltered in some patients and improved with rehabilitation in others. Schmidt appreciated the wide varieties of aphasia and individuality of rehabilitation processes.

German physician Peter Rommel (1643-1708) wrote about a rare case of aphonia—severe motor aphasia. Although, the terminology in his report is quite confusing since "aphonia" or "alalia" was a general term used from Hippocrates until the nineteenth century to describe speechlessness of any cause. As aforementioned, there was no clear "distinction between disorders of the voice and the articulators, and disorders of language was not reflected in any consistent use of terminology" (Howard & Hatfield 1987). Schmidt was the first to make clear distinctions, but it was unlikely that Rommel read his work at this time. He was a physician and not a scholar after all. Rommel entitled his study *De aphonia rara* (On a rare aphonia). The patient was a well-respected 52-year-old woman who suffered a mild apoplectic attack and thus had right-sided paralysis and lost propositional speech and reading comprehension. She recited biblical verses and prayers only in the order at which she was accustomed to saying them, so her

automatic and serial speech remained intact. Rommel noted his attempts at verbally prompting her to recite phrases such as “God will help” with no success (Prins & Bastiaanse 2006). She strained in her efforts that ended in catastrophic emotional distress. Rommel’s work presented, for the first time, a rare condition in which he was able to clearly delineate the deficits and preserved capabilities of the patient.

Some sixty years later, Swedish historian Olaf Dalin (1708-1763) recorded a similar case of which he titled, “Story of a mute who can sing” (Prins & Bastiaanse 2006). In said observations, he explained how a 33-year-old Swede had a sudden attack of illness of some sort that resulted in right-sided paralysis and a complete loss of speech (Howard & Hatfield 1987). After a couple years, the man was only able to say the word *yes* and sing hymns that he learned before his attack. At the beginning of the hymn, he needed minimal assistance, but he sang with clear and accurate articulation. His course of therapy began with singing speech along with his therapist to “exaggerate intonation and rhythm, towards more normal speech [which] is the foundation of the modern approach of Melodic Intonation Therapy—MIT” (Howard & Hatfield 1987). The previous three cases suggest a transition in aphasiology towards understanding the psychological causes and effects of aphasia, as well as steps towards building rehabilitation practices.

A milestone in the history of aphasia must be attributed to Johann A.P. Gesner who wrote 75 pages on speech amnesia alone. He additionally recorded various forms of aphasia never previously discussed such as jargon aphasia, jargon agraphia, and stereotypical utterances. Stereotypical utterances (aphastic speech automatisms) are repetitive vocal sounds that can present as either real content words, that may or may not be the correct target word, or non-existent words (neologisms). Jargon agraphia and jargon aphasia describe fluent language,

written and spoken respectively, that is indecipherable due to the frequency of paraphasias, neologisms, and semantic errors. Gesner's vivid descriptions of such cases allowed the study of complex cases such as the patient with jargon agraphia and jargon aphasia. He "points out that some of the 'neographisms' of this patient showed phonetic correspondence with the 'neologisms' that he uttered" (Benton 1965). In addition to Gesner's interesting clinical work, his most important contributions to aphasiology are his speculations on the connection between the anatomical and psychological impairment behind these disorders and language amnesia. He explains how aphastic disorders are not due to "a general intellectual decline or a general loss of memory, as has been done in the past, but to specific impairment in *verbal* memory. This impairment in memory consists in the inability of the patient to associate images or abstract ideas with their conventional linguistic signs" (Benton 1965). When a patient attempts the association between thought/concept and its corresponding verbal symbol, paraphasias or neologisms are uttered. His theory distinguishes aphasia from a disorder of concepts and of speech production. Alexander Crichton in 1798 later put out a similar idea stating aphasia was more, "a defect of that principle by which ideas and their proper expressions are associated than of memory" (Benton 1965). This ideology laid the foundation for associationism and neurologists of the 19th century such as Broca and Wernicke.

Knowledge of aphasia by 1800 was quite extensive. Thanks to the descriptions of the previously mentioned physicians, almost all of the clinical forms of aphasia were documented (i.e. complete motor aphasia, jargon aphasia, agraphia, and alexia). However, the milder forms of syntactic aphasia and the major sensory aphasia were yet to be described. This can be due to the focus on discovering the extent to which speech comprehension was retained in patients with deficits in speech expression.

19th Century

The first half of the 19th century generated landmarks on the history of aphasia leading up to Broca and Wernicke's work. Such advancements encompass clinical observations of auditory comprehension disorders never previously discussed which suggest, in a more concrete way, the distinction between disorders of speech and language. These studies supported the idea that aphasia occurs without intellectual impairment. New aphastic phenomena describing symptoms of aphasia had been documented; for instance, the occurrence of jargon aphasia without comprehension disorders observed by Osborne in 1833 (Buckingham 2006). Lordat's observations on selective loss of language of a bilingual patient in 1843 and a cases of agraphia present without severe spoken language disorders were additionally recorded. Progress in the anatomical localization of expressive language pointed to it being positioned in the anterior part of the brain. Advancements by Marc Dax suggested left-sided cerebral dominance controlling language.

The first neuroanatomist, Franz-Joseph Gall specialized in localizing higher cortical functions. Challenging all previous ideals, Gall pushed the boundaries in regards to the relation between the body and mind. Although Gall correctly and extensively defined the grey matter of the brain from the white matter, his theories on localization were highly based on pseudo-science rather than neuroanatomy and psychology. According to Gall, the brain was composed of "distinct organs, each with its own form and function" (Prins & Bastiaanse 2006). He believed the feel of the sulci and gyri of the brain localized psychological functions such as "parental love," "verbal memory," "aptness to receive education," "memory," "kind-heartedness," etc. (Prins & Bastiaanse 2006). To support his claims, in 1806 he published a series of investigative cases in which those with said attributes have an observably large portion of their brain/head that

corresponds to the target quality. For example, Gall made a distinction between verbal memory and a "general faculty of language…An exceptional verbal memory reflected itself in prominent protruding eyes, while a highly developed general faculty of language (as could be found in great literary and philosophical figures like Bacon or Voltaire) manifested itself in largely swollen lower eyelids or 'bags'" (Prins & Bastiaanse 2006). He theorized that verbal memory rested in the portion of the brain behind the eyes, so those with a large capacity for language and vocabulary had bulging eyes. Uninterested in providing solid evidence besides his circumstantial observations, Gall's ideas were nonetheless popular for a few decades. Scholars like Bouillaud used his assumption that language is localized in the anterior part of the brain, the most accurate claim of his research.

One of the most influential forefathers of Broca was Jean-Baptiste Bouillaud. He supported Gall's theory, and taught it as a professor of clinical medicine in Paris. He studied autopsies of brain-damaged patients published by colleagues. In his 1825 paper, he recounted fourteen cases in detail with eight patients who suffered from loss of speech with lesions in the anterior part of the brain (Buckingham, 2006). The remaining six patients without speech disorders did not present with lesions in this region. Bouillaud concluded that:

> The movements of the speech organs are controlled by a special, distinct, independent center [and that] this cerebral center is seated in the anterior lobes…it is quite necessary to distinguish in the act of speaking two different phenomena, namely, the faculty of creating words as signs of our ideas, to preserve their memory, and to articulate these same words. There is, so to speak, an internal speech and an external speech: the latter being only the expression of the former. (Prins & Bastiaanse 2006)

Foundational in modern aphasiology, he differentiated a disorder of articulated speech and language. He goes on to explicitly separate these disorders from that of the tongue: "The loss of speech does not imply that of the movements of the tongue, considered as organ for the grasping, mastication, and swallowing of food […] which supposes that the tongue has three different action sources in the nervous center" (Prins & Bastiaanse 2006). Bouillaud's views faced high volumes of refutation. Andral, namely, tried disproving Bouillaud's theory with sixteen examples of patients with lesions in the anterior frontal lobes, whom did not present as having speech disorders, and fourteen cases where speech disorders were present, despite the absence of lesions (Prins & Bastiaanse 2006). His work was a hot topic of discussion, inspiring Paul Broca to perform his famous post-mortem examinations on speechless patients.

Before Broca, there were still two noteworthy forerunners: Marc Dax (1836) and Jacques Lordat (1843). Marc Dax is known as the founder of cerebral dominance. Mistakenly, people originally credited Broca with this discovery because of an article he published four years after his "seat of articulated speech" discovery (Buckingham 2006). However, Marc Dax wrote his article "Lesions of the left half of the brain coinciding with the forgetting of the signs of thought" in 1836, and his son Gustav Dax published his father's work in April of 1865, just six weeks prior to Broca's article (Prins & Bastiaanse 2006). Dax collected over forty similar cases without any exceptions and was able to conclude, "that all diseases of the left hemisphere must alter the verbal memory, but that, if this memory is altered by a disease of the brain, one must look for the cause of the disorder in the left hemisphere, and still look for it there when the two hemispheres are diseased together" (Prins & Bastiaanse 2006). Marc Dax also concerned himself with the legal and medical issues that patients may face, he humbly advocated that aphastic patients do

not suffer from mental disorders. Since their intelligence is still in-tact, they should maintain their power of attorney and, thus, responsibility and independence over their affairs.

Jacques Lordat (1843) is perhaps one of the most interesting cases being that his research was autobiographical. Lordat was not the first account of autobiographical aphastic observations. Johann Spalding (1783), Samuel Johnson (1783), and Jean-Paul de Fouchy (1784) described their episodes previously. Nonetheless at the age of 52, Lordat experienced an aphastic episode that lasted for weeks. He had speaking and language comprehension obstructions that he associated with his difficulties in understanding written language. Lastly, he explicitly noted verbal and phonemic paraphasias and a selective loss of spoken language in a bilingual patient (Prins & Bastiaanse 2006). He referred to aphasia as "alalia" and paraphasia as "paramnesia" due to his faulty retention of words, their meanings, and their visual symbols (Prins & Bastiaanse 2006). For example, when he wanted to ask for a book, he would use the word "handkerchief" instead. Additionally, he would rearrange the letters in words when speaking, so he would say "sairin" in lieu of "raisin" (Prins & Bastiaanse 2006). He was immediately aware of his errors after he had made them. In regards to writing, he describes how he recognized individual letters of the alphabet, but could not syntactically recognize nor form words. He concluded his remarks advocating that the intellectual abilities of aphastic patients are unaffected, thought and language are independent of each other, and aphasia is not a mental illness or sign of madness (Prins & Bastiaanse 2006).

Highly influenced by Charles Darwin and Gall's work, Broca's research focused on studying the skulls and brains of different human races. He believed that each race was a different species, using the topography of the skull and brain as evidence. Paul Broca, a French surgeon and an anthropologist, frequented medical conferences like the Society of Anthropology

meeting in Paris in the spring of 1861 (Howard & Hatfield 1987). There, he examined a patient, both before and after death. This patient had speech disorders as well as lesions in the anterior, left temporal lobe of the brain. This led to his localization of the "seat of articulated speech" (Buckingham 2006). Known today as Broca's area, it is responsible for the production of speech. Paul Broca 1861 "Broca's principle contribution was to more precisely sharpen that localization upon the inferior foot of the third frontal convolution within the anterior lobe" (Buckingham 2006).

One of Broca's most famous cases "Tan" describes a man who was incapable of producing any other speech besides the word "tan". Bouillaud's work influenced Broca in Broca's interpretation of the patient's loss of the "ability to coordinate the movements associated with articulated speech" (Prins & Bastiaanse 2006). Broca diagnosed Tan with what he called Broca's *aphemia*, later renamed "aphasia," but Tan's modern diagnosis would be severe global aphasia (Buckingham 2006).

Now that he connected the region of the brain to the function, Broca made multiple systematic attempts at re-educating language to aphastic patients. Howard and Hatfield simplify Broca's theory; "since the disability was a consequence of damage to a small area of tissue in the left hemisphere, he wondered whether, with proper teaching, the corresponding area in the right hemisphere would be able to take over the damaged functions" (1987). An interesting theory to be taken very seriously for the following decades, Broca thought that such teaching would require multiple, daily lessons. He viewed the language re-education to that of child language acquisition, all the while noting that the specific procedures for adults and children may differ. One complaint of Broca's that still holds firmly true to this day is the inadequate amount of time therapists are able to work with their speech patients; he points out in a snippy rant that it is

harder for adults to learn language after a certain age (Howard & Hatfield 1987). While working at a Paris hospital, he had a brief session with one aphastic patient every day. He claims to have increased said patient's vocabulary as well as his letter recognition, but a few minutes each day was not enough for the patient's progress potential. Suffice it to say, as a grandfather in aphasiology, the work of Broca is largely due to the precursors before him.

After Broca, Armand Trousseau published a three-volume work on clinical observations of aphasiology. He focused on rehabilitation and treatment. His case studies had various causes for aphastic episodes, including syphilis, heart conditions, gout, Bright's disease alcoholism, and apoplectic attacks (Howard & Hatfield 1987). Trousseau recorded a variety of aphastic symptoms, which makes sense since diagnoses for different types of aphasia were not defined until the 20th century. He did, religiously, note each patient's capabilities and symptoms such as what they could say, repeat, write, location of paralysis, etc. He explicitly observed echolalia, a rare symptom, and preservation in patients. Echolalia is the involuntary repetition of someone else's words after they speak them. Preservation is the occurrence of an incorrect response that the patient had previously given earlier. The response could have originally been either correct or incorrect. He treated his patients with leeches to reduce blood accumulating in the brain (Howard & Hatfield 1987). This method proved successful on multiple occasions. He created a repetition therapy for over 100 patients, showing that aphasiologists spent countless hours helping patients.

Bastian (1869) and Wernicke (1874) realized the notion that aphasia could involve impairment in the comprehension of speech. German neurologist Carl Wernicke overshadowed his predecessor H.C. Bastian. Wernicke's area helps us comprehend language. Found in the posterior, left temporal lobe, it is connected to Broca's area with nerve fibers. Wernicke published the localization of this function in an authoritative text in 1874. Bastian "was the first

person to observe that aphastic disorders were not confined to language production, but there could also be difficulty in comprehension" (Howard & Hatfield 1987). He created the Direct Speech-training method in which the therapist systematically gives specific lines (visually or verbally) to the patient. They are then expected to repeat the lines back to the therapist. He believed "in the possibility of transfer of function from one part of the dominant hemisphere to another and from the dominant hemisphere to the minor hemisphere" (Howard & Hatfield 1987). Playing off of Charcot's language theory and model, he constructed his own psychoanatomical model outlining four centers of the brain: articulation, writing, auditory word center, and visual word center. This famous model was named the Reflex Arc Theory, which outline sensory and motor centers to explain brain function. He explains how they are not separated but rather are "diffuse but functionally unified nervous networks" (Howard & Hatfield 1987). For example, deficits in the auditory word center would impair comprehension of speech and affect verbal expression. Surprisingly, many of his suggested sub-tests are in use today, with modifications (i.e. his reading tests in which a patient is assisted in reading short words or letters through finger tracing) (Howard & Hatfield 1987). His re-education methods originated from revising methods used in teaching the deaf and mentally impaired, specifically for highly nonverbal children with delays in speech and language. Bastian's contribution to aphasia therapy lies in his having a clearly formulated theory (even if wrong) to base a system of re-education.

20th Century to Contemporary Therapy

The turn of the century brought a boom of research and focus on aphasia and methods of rehabilitation, many of which were repetitive and circling around the same themes. After WWI and WWII, the number of younger aphastic patients drastically increased, as did the interest in rehabilitation. There are far too many aphasiologists to name one by one, so I mainly focus on

the theoretical contributions and the different schools of thought that emerged out of this century and lasted into modern day therapy. The seven schools of aphasia therapy are the: didactic school, behavior modification school, stimulation school, pragmatic school, neo-classical school, neurolinguistics school, and cognitive neuropsychology school.

The didactic school covers a broad range of treatment approaches largely influenced from those of the nineteenth century. The didactic school of aphasia therapy refers to the style of therapy in which the therapist focuses on a form of specific language training. This approach aims at relearning missing information. Braun of Bonn's work in 1973 effectively sums up the main contributions of this school of thought. Braun wrote a monograph describing detailed exercises for seven different types of aphasia. She stresses how treatment needs to be a progression, beginning with the easier exercises working towards the difficult ones. In theory this is a logical process, but later research shows that ordering a hierarchy for which sub-skills constitute as harder than others is quite difficult. Nevertheless, Howard and Hatfield summarize her work on total aphasia (comprehension deficit and severe expressive disorder present); "Expressive speech is regained in the most severe cases by conventional kinds of facilitation—completion of word-pairs, sayings, etc.—as well as simple repetition" (Howard & Hatfield 1987). Interestingly enough, Braun used singing as a form of therapy. She had her patients sing folk songs together, focusing on forming the consonants. Gradually varying the tone and words, the songs turned into speech. She mentions vocabulary building exercises for motor aphasia concentrating on picture-naming and repetition using subject-verb-object sentences then, later, the more complex object-verb-subject structures. The re-education of language has two main objectives. The first is to restore the patient's internal lexicon, and the second is to improve "situation-related language" (Howard & Hatfield 1987). The main critic for the didactic school

was Dusseldorf (1973) who accused the therapists' work of lacking theoretical foundations and a clear system of treatment, and he also believed that therapy was a waste of time because aphasia was incurable. Even in the 1970's there were some who held the view of the Ancient Egyptians that aphasia was "an aliment not to be treated" (Prins & Bastiaanse 2006). Although the reasoning behind Braun's treatment selection was unclear at times, she could hardly be accused of lacking systematic treatment procedures.

The behavior modification school is less of an aphastic theory and more of a method of therapy still used today. Widely impacted by Skinner's operant conditioning, this approach aims at shaping the patient's verbal behavior through the use of reinforcement, thus improving his language via teaching strategies. According to this school of thought, the therapist must assess the patient's abilities and disabilities before specifying the target behavior to rehabilitate. This becomes complicated when the therapists must decide what will motivate the patient enough to use as a reinforcement tool. From my experience working as a speech language pathologist aide at a rehabilitation hospital, this seems to be the most difficult and widely varying task. Each patient presents aphastic symptoms differently, and one must quickly establish a close and positive working relationship with said patient during their ability assessment in order to find an effective, personalized reinforcer. This benefits the rehabilitation process because it gives the patient immediate results of their progress. The main aphasia therapy contribution of the behavior modification school was the "development of experimental designs for examining the effects of specific treatments with single subjects" (Howard & Hatfield 1987). To reiterate, behavior modification serves as more of a method behind therapy in lieu of a systematic therapeutic procedure.

Physicians belonging to the pragmatic school of aphasia therapy believe speech therapy should focus less on language and more on communication. Patients should, they argue, optimize all of the other forms and resources of communication both linguistic and nonlinguistic (i.e. intonation, stress, gestures, facial expressions, context, etc.). Treatment should not be concentrated on language production or comprehension. Davis and Wilcox developed the PACE approach—promoting aphastics' communicative efficiency. The basis of this therapy relies on the patient and the therapist equally participating in a conversation using object pictures. The objective is to take turns communicating to the other what object in on their card (unable to be seen by the other person). Their reasoning is based on the idea that performing formal exercises teaches linguistic structures that not only concentrate on the patient's disabilities but also discourage non-verbal communication; they also argue that it teaches skills that the patient is unable to generalize into everyday life (Howard & Hatfield 1987). Apparently, the PACE method does not use any direct method of instruction, leaving the patient to infer what is expected of them. Results of these studies confirm "patients' linguistic disabilities remain unchanged while their communication abilities in role play improve" (Howard & Hatfield 1987). Although heavily disputed, some refined variations of the pragmatic school methods are still in use today.

The neurolinguistic school of aphasia therapy is complex in nature, combining neuropsychology and linguistics. This school was heavily influenced by Noam Chomsky's work. Specifically, they used his distinction between competence and performance and his discovery of transformational grammar in therapies of expressive speech. This was the first school of thought to apply phonological principles and features to analyzing deficits in speech production (Howard & Hatfield 1987). In the US specifically, aphasiologists began using Chomsky linguistics to

focus on patients' lexicon, morphology, and syntax. Although there was much research conducted during this time, those that incorporated and tested the linguistic terminology and methods could be attributed to the work of the neurolinguistics school.

Next, we have the school of cognitive neuropsychology that presented a vastly new approach to aphasiology. Initially, this approached developed from the study of patients with acquired dyslexia; one patient could not read non-words and continuously made syntactic errors while reading (e.g. read LIBERTY in lieu of "freedom") (Howard & Hatfield 1987). This lead Marshall and Newcombe to connect this patient's deficits to the dual route theory of word reading recently developed by cognitive psychologists (Howard & Hatfield 1987). The dual route theory states the two ways real words can be pronounced. The first the lexical route identifies the whole word, then the pronunciation, and lastly the meaning. The non-lexical route is used when words are unknown whether due to the aphasia or otherwise; the brain uses the word phonology to be able to then pronounce the word. However, this only works if the spelling of the real word represents the phonology (if the spelling allows the patient to sound-out the words, so to speak). Whereas, if given an irregularly spelled word such as "yacht," the patient will have great difficulty. There are three methodological features of the cognitive neuropsychology school:

> Patient difficulties are located within information processing models…second, cognitive neuropsychologists assume that, when one or more components of an information processing system are impaired by brain damage, the remaining components will operate normally…Thirdly, cognitive neuropsychologists operate with data from single subjects…to understand how an individual patient's pattern of intact and impaired language skills can be accounted for. (Howard & Hatfield 1987)

The most important contribution of this school of aphasia therapy is the lexical processing model, which demonstrate how a word in the lexical memory matches the representation/idea of that word. It shows centers of the cerebral cortex with arrows running to and from these centers. This model monumentally gave us a better understanding of how language is processed during language comprehension and production.

The stimulation school concentrated on articulation due to their belief that language comprehension and production are not lost—only impaired. This therapy uses auditory stimulation to ease the progression from involuntary responses to appropriate speech production. Joseph Wepman, a primary figure in the development of rehabilitation practices of this school, started a program in an army hospital for aphastic soldiers in WWII (Howard & Hatfield 1987). Using Progressive Achievement Tests (including reading, writing, spelling, and math), he centered his work around the concepts of stimulation, facilitation, and motivation. There were many other forms of treatment using stimulation theories, but the stimulation school has been discredited due to their lack of methods and evidence and the copious amount of contradictory evidence against their research.

However, the last school of thought to be discussed is the neo-classical school. Treatment is directed "at four traditional modalities: spoken language comprehension, written language comprehension, and spoken and written language production" (Howard & Hatfield 1987). It is noteworthy to mention that the neo-classical school categorized the different types of aphasia that we now know today. To summarize, I have provided a table outlining the categories and their diagnostic factors:

TABLE 1

The Neo-classical Categories of Aphasia

Aphasia Type	Speech Fluency	Auditory Comprehension	Repetition	Naming
Global	Non-fluent	Poor	Poor	Poor
Broca's	Non-fluent	Good	Poor	Poor
Mixed Transcortical	Non-fluent	Poor	Good	Poor
Transcortical Motor	Non-fluent	Good	Good	Poor
Wernicke's	Fluent	Poor	Poor	Poor
Conduction	Fluent	Good	Poor	Poor
Transcortical Sensory	Fluent	Poor	Good	Poor
Anomic	Fluent	Good	Good	Poor

The Neo-classical School and MIT

The neo-classical school owes the stimulation school credit in that they attempted to categorize their patients by ability. The neo-classical school, like Dalin in the 18th century and Braun in the 19th century, observed that some aphastics preserved the ability to produce serial speech, nursery rhymes, prayers, poems, songs, etc. Their work led to the creation of Melodic Intonation Therapy. Sparks, Helm, and Albert (1974) created a program that uses sung intonation of propositional sentences so that the sung pattern is similar to the "natural prosodic pattern of the sentence when it is spoken" (314). MIT operates on the notion that is it easier to train rhythm of speech as opposed to the grammar of speech. The patient begins the therapy singing along with the therapist to develop oral expression. They sing simple melodic patters such as "I am hungry." Based on the natural stresses and intonation of the sentence, the therapist first adds a

melody and exaggerates the elongation and stresses so they would sing in unison, “I am HUNGry” or “I want some DINner” (Sparks, Helm, & Albert 1974). Six of their eight patients were successful in recovering appropriate propositional language which suggests that the less developed language areas and music dominance areas in the right hemisphere might be supporting the damaged, language-dominant left hemisphere. Very little research has been conducted since this 1974 study, regardless of its success. Since then, a pilot study on a Modified Melodic Intonation Therapy was conducted in 2012. The results “provide preliminary data supporting the possible benefits of utilizing MMIT treatment early in recovery of nonfluent aphasia patients” (Conklyn et. al. 2012). Due to these limited studies, I propose that poetry therapy should be used as a tool in MMIT. MMIT as it stands in its beginning stages of therapy, focus on nonfluent speech production and therefore patients with nonfluent forms of aphasia. However, poetry therapy could perhaps reach a wider platform of aphastic patients suffering from alexia and/or agraphia. The composing of poetry coupled with MMIT as a form of therapy will target reading and writing as well as speech production and comprehension.

There are stories about patients using their recovery from aphasia as a motivation for their poetry. Stroke survivor, Leonard Zion, experienced the inability to comprehend, speak, or write. Through his aphasia rehabilitation and with limited mobility, Zion recorded his thoughts and feelings via poetry in his book *Finding Another Voice: Moments of Wonder*. He arranged the book in chronological order from 2002-2005. Throughout the poems, Zion shares his journey in beautiful verse. One is able to pick up on the subtle improvements of the therapy as the pages turn. Leonard Zion should be all the motivation needed to delve into this new field of therapy.

From its humble beginnings to present day, aphasiology underwent a gradual metamorphosis. First being recorded in Ancient Egyptian texts, it was disregarded and thought of as an ailment not to be treated. Throughout the middle ages, physicians began to slowly connect aphasia and speech disorders to the brain instead of the heart. The Renaissance drastically changed the view of aphasia namely with Antonio Guainerio localizing aphastic disorders to a part of the brain. Even though the localization was incorrect, the spirit of his research was influential. Grafenberg, additionally, distinguished disorders of language from those of speech. His research also appreciated the true nature of aphasia. The 17th and 18th centuries were tedious and vital, filled with clinical observations and theories that outlined and recorded almost every form of aphasia and its symptoms. The 19th century molded aphasiology into a more consistent practice. There were many important contributions during this time. Marc Dax declaring left-sided cerebral dominance as the hemisphere that controls language shifted aphasiology towards its modern diagnosis. Paul Broca and Carl Wernicke did this as well with their definitions and localizations of brain and language functions. The turn of the century changed the focus towards treatment and rehabilitation. The 20th century to modern day produced copious research that transformed into a widely recognized profession and specialty with various schools of thought. Each perspective on aphasia offers different theories and therapies all aimed toward the patient regaining his/her independence and voice. Poetry therapy is a specific exercise of rehabilitation that stemmed from melodic intonation therapy. Poetry and language share so many interconnected qualities (i.e. rhythm, timing, vocabulary, form, etc.) and with the positive results thus far, it would be a missed opportunity to not research it more. An example of poetry therapy successfully rehabilitating an aphastic patient is the work of Leonard Zion.

Chapter 2: Aphasia Poetry

A Good Sign
Leonard Zion

To learn a way to say a word, it was difficult;
Sound a sound, it was impossible!
Only, having been there,
I was the one person who felt I was nowhere.

The usual things and other voices were being lost,
Overwhelming, I was bewildered.
I had to turn to my mind to recall the echo,
Where to go or not to go?

What was I to do? I had a desire for someone to whisper
That I would be speaking, again.
Without the expectation to talk that soon,
I was so eager to converse.

Slowly, painstakingly, determined to be,
Connected with another person and to others,
It was important that I would find a method
To follow as a map-reader would have his own guide.

To fold open and to look where I had been,
Going forward, and when, or if I were to be somewhere,
All I imagined to be feasible
Would that be too unreasonable?

I wanted to sit at a computer,
To see the little words that were forgotten, but were still there.
They were not lost at all.
This was a good sign!

February 7, 2004

Finding Another Voice
Leonard Zion

Here or there, everywhere or anywhere,
around the corner,
afar, remote, from the distance,
at that moment, what happened?

All around me,
enveloped by silence
within my head, would I still be alive?
Would I be able to find my own voice?

When I missed my memory,
I could not say any name, or sound a sound,
but to wait until dawn, eager to leap, yet to imagine,
would I find another voice in my recovery?

Since I never wrote a poem, ever,
throughout my life before, my computer and I:
we would discover a memory, a map,
for a wider world beyond.

November 22, 2004

Leonard Zion suffered a severe stroke in 2001. His book *Finding Another Voice: Moments of Wonder* is a chronological collection of poems that he wrote during his recovery process from aphasia. His book is loaded with powerful imagery, metaphors, and language. A few honorable mentions are his poems "Walden Pond," "On and On: Twin Towers," and "In the Land of Utopia!" Walden Pond is the first poem in the book, written on March 9, 2002 (Zion 5). Compared to his later poems his first is shorter with simpler phrases and concepts, which demonstrate the earlier stages of his speech rehabilitation. His description of a sunny, autumn day emphasizes the natural beauty in confusion and solitude.

His second poem "On and On: Twin Towers" is both a tribute to his brother Charles A. Zion, who died in the Twin Towers on 9/11, and to life and his recovery. The motif "on and on" transforms its meaning throughout the poem while still maintaining its previous significance (Zion 6). At various points it symbolizes perseverance, life, misery, mystery, and recovery. It creates the illusion of time and space to reflect his rehabilitation and mourning processes simultaneously. All in all, this poem makes a statement on the "joy of mystery" in living in the present (Zion 6).

The third poem "In the Land of Utopia!" Zion maintains the metaphor of comparing aphasia to a toy; it is huge in size and everywhere all at once. It is made original each time and exists in his imagination. Zion personifies this toy to comment on the ways in which aphasia seems to be a whole other being controlling the person it's affecting. When people look at it, they label it as "other". It has a kind heart and soul described as a gentle and happy being that is voiceless while still trying to breathe and find the appropriate sounds to express slowly. It is a toy he wants to share with the world to make aphasia a less stigmatized condition.

Unsure of his diagnosed type of aphasia, one can deduce some of his major aphastic symptoms. In “Finding Another Voice” and “A Good Sign,” Zion is unable to speak or write. However, his reading and writing comprehension still seem to be in-tact. He mentions using a computer to write, which points to a certain degree of immobility. Since he is non-fluent with moderate to good auditory comprehension, poor repetition, and poor naming, it is safe to assume he was diagnosed with Broca’s aphasia.

The poems to follow are original. Some are persona poems to express the perspectives and experiences of the patient, loved ones, and the speech language pathologist, all of whom are integral during the rehabilitation process. I wanted to represent a couple different forms of aphasia to exhibit just how vastly different each diagnosis is. I chose to write the poems mainly in free verse to demonstrate the liberation that poetry therapy gives to its patients in aiding them to find their voice again.

Good morning, Beautiful

Waking up in the morning,

The sun beaming in through the window,

I hear the beep beep beeping of the monitors

I see framed pictures of my family to remind me I'm not alone.

I cannot pronounce their names.

My wife awakes on the hospital couch beside me.

I cannot say "Hello" or "Good morning, Beautiful"

Or sing to her our morning song as she makes our coffee.

Or annoy her with my impersonations of her "mad voice"

Or explain to her once more why I will not sell the old car.

She rises slowly, and makes her way over to me.

She furrows her brow and squints her red eyes

The way she did when Leo had his appendicitis

I want to tell her it'll be alright

I want to tell her to go home and rest

I want to tell her to sell the old car to pay for all the medical expenses,

But I cannot even say "Hello" or "Good morning, Beautiful"

She speaks to me all the time, but I still miss her voice.

Only sometimes can I make out what she is saying,

So she writes it out: "I love you"

In my mind I say, "I love you, too."

Tough Days

Working in a rehabilitation hospital can be heavy on the mind,
Maintaining patients' dignity via a supportive, positive attitude when
some patients have completely lost the ability
to communicate,
walk,
button a shirt,
sing,
go to the restroom in peace…
I try to learn about each person as much as I can
in the few months of their time at the facility,
The SLP I assist tells me if you learn the individual,
you will see which methods facilitate their improvement the most,
but you have to be observant and patient.
Establishing a meaningful relationship with
one's patient is never the same,
each patient's condition is unique
with intricacies,
unveiling themselves solely through the speech sessions.
One must be positive,
but genuine.
This seems simple enough, right?
But what do you do when your patient is having a particularly hard time?
Not only are they experiencing a setback in their condition,
Unable to complete the exercises and therefore improve,
but they break down and cannot tell you why.
How do you comfort someone who cannot understand what you are saying?
How lonely that must feel, trapped in your own thoughts
unable to let anything in or out.
We call these the tough days.

Gramps,

I know there is so much behind your eyes
They glisten with life—full of the potential
I am so close to understanding
If only I could read them better
If only I could once again read your thoughts
If only I could listen to your jumbled words and,
like the dozens of puzzles we've done,
piece them together into cohesive sentences
where we will then be whole again, no more distance.
Nonetheless, I see fight in you,
so as long as you try, I'll try too

Fluent Speech in Wernicke's Aphasia

SLP: Hi, Bob, how are you?

Bob: I am up and bright. Are you pretty?

SLP: What are you doing today?

Bob: Oh, we're off the car and talking with the people the day with water very soon.

SLP: You came here in a car, and you are at a speech session. What did we do just now?

Bob: Right now a dollar for me and talk with the people and Danielle right now with zips over there for him and changes for him-

SLP: What were we doing just now with the iPad?

Bob: With hands for hands he play ball over there sometime with ball and swim swimming. I love to eat for you I do for hands with them.

SLP: Thank you, it was nice working with you today. I will see you next time, Bob.

Bob: Thank you. I much appreciate your pretty. I hope the world lasts for your pretty.

Non-Fluent Speech in Broca's Aphasia

SLP: Hi. Can you tell me your name?

Ben: uh...Ben Benjamin

SLP: And Ben when was your stroke?

Ben: um. Six. Years. Ago.

SLP: Okay. And what did you used to do?

Ben: Well, um...worked. In a kitchen. Shelf sh-chef and very good, yeah.

SLP: Okay, and who are you looking at right now?

Ben: That's...my wife. She, um. Print um...pretty.

SLP: Very good. She is pretty, and why is she helping you to talk?

Ben: She, um, speech.

SLP: You have difficulty with speech.

Ben: Yeah.

SLP: And what's that called?

Ben: -phasia.

Chapter 3: A Brief History of Stuttering

Speech differentiates humans from living organisms more so than any other faculty we possess. In Plato's *Sophist*, he considered speech "the conversation of the soul...the stream of thought moving outward from the soul to the lips" (Bobrick 23). In fact, in the Bible Adam's first human act was speech (Genesis 2:19). It is the way in which one bridges the connection of *intra*personal and *inter*personal communication, forming new relationships and experiences, but how is speech produced? It is known now that through a series of precisely coordinated muscle movements (e.g. breathing, phonation, and articulation), speech sounds are produced. Phonation is the process responsible for voice production while articulation involves the movement of the throat, palate, tongue, and lips. The core behaviors of stuttering include disfluencies in repetitions, prolongations, and blocks. If it were not for speech and communication disorders, such as aphasia and stuttering, would we have taken such an in-depth interest in understanding the intricacies involved in speech?

Stuttering in Antiquity

Since humankind began to use speech as their main form of communication, one's quality of speech has been an admirable and vital skill. One of the earliest and most well-known written records of speech disorders are in the oldest chapters of the Hebrew Bible, estimated to have been written in the tenth century BCE. References to stuttering specifically occur a few times in the book of Isaiah (28:11; 32:4; 33:19), which was written in the eighth century BCE (Wingate 11). Moses' famous Exodus 4:10 states that he is "of slow speech, and of a slow tongue," which is thought to have been written circa 1000-1400 BCE (Wingate 11). The importance of quality speech was highly valued in Ancient India as well. Sanskrit texts (written c. 2000 BCE) analyze many aspects of speech including identifying disorders and potential

treatments. These texts stated various causes for these speech disorders, and it implied neurological involvement as being the most frequent cause. This is wildly progressive for its time, and as expressed in the first chapter, it took centuries before the connection between speech disorders and the brain was widely accepted.

In addition to aphastic records, cases of stuttering were also recorded in the Ancient Egyptian *Edwin Smith Surgical Papyrus* (c. 2800 BCE) where physicians described twenty-seven of forty-eight medical cases to be due to severe head trauma. As mentioned in chapter one, some of these cases resulted in "speechlessness" which Speech Language Pathologists (SLP) today believe to be but not limited to aphasia, dysarthria, apraxia of speech, anomia, etc.

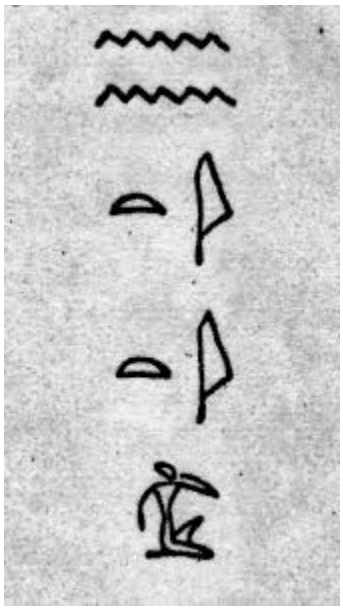

Figure 1. The hieroglyph for *stutter (Shell 169).*

In the Ancient Egyptian *Tale of the Shipwrecked Sailor*, from which this hieroglyph was taken, a servant speaks to his master: "You must answer when questioned. You must speak to the king with presence of mind. You must answer without stammering! A man's mouth can save him . . ." (Shell 169). In the hieroglyph, the seated man with his hand to his mouth is the generic determinative used after verbs to determine the context for the entire hieroglyph; he, specifically, can be used in contexts for speaking, thinking, eating, and feeling. This hieroglyph phonetically translates to the Egyptian verb "nitit"; it is "one of a set of verbs with a performative *n-* and a reduplicated bilateral root (in this case, *it*, keeping in mind that *i* is a consonant here). These verbs are generally intransitive, often reflexive, and frequently iterative, conveying repeated or continuous action" (Shell 169). An additional hieroglyph was found with the same generic determinative; it's phonetic translation yields the word "ketket" (with this determinative of the man gesturing to his mouth and an additional set of

symbols meaning "to stutter") (Wingate 13). An Egyptologist was consulted regarding the glyph and its phonetic value, and he suggests, "it is clearly structured like a word for stuttering" (Wingate 13). These two references show that the Ancient Egyptians made the distinction between normal and abnormal fluency in speech. Although, at that time, Egyptian physicians were more concerned with treating the wound rather than focusing on the rehabilitation of one's speech.

The intrigue in speech and communication disorders increased with education and religion. Ancient Greek philosophers recorded their thoughts on medicine extensively. However, similar the early recordings of aphasia, no clear distinctive vocabulary defined and, therefore, differentiated stuttering, cluttering, dysarthria, functional articulation issues, and certain types of aphastic symptoms (Rieber & Wollock 1977). The imprecise terminology for these various conditions is reflected in the generalized names such as "traulosis, psellismos, blaesitas, balbuties, and mogilalia" (Rieber & Wollock 1977). Aristotle clearly used the term "ischnophonia," on the other hand, to mean stuttering (Rieber & Wollock 1977).

Hippocrates (460-377 BCE) is famous for being one of the first Greek physicians to base his practice on the theory of the humors, which he depicts tediously in the *Hippocratic Corpus*. He used the theory of humors to understand bodily functions as they relate to diseases and the four elements of the earth: earth, air, fire, and water. He theorized that these elements were inside each being as the four humors (i.e. yellow bile, black bile, blood, and phlegm) which is responsible for the condition of the body and mind. There are numerous casts of voice and speech linked to the various combinations of humors resulting in different temperaments. The disease was not a speech deficit as much as it was an imbalance in the humors affecting the body and voice. There were two main assumptions in medicine at this time: 1) the doctrine of the

humors and 2) the concept of the "soul". Since this was the basis of medical knowledge, Aristotle created a theory of why cold temperatures result in speech impairments:

> Why does the tongue of men who are chilled stumble like that of a drunkard? Is it because it becomes congealed and hardened by cold and so is difficult to move, and when this occurs it cannot articulate clearly? Or is it because, when the outward parts thicken through cold, the moisture collects and soaks the tongue, wherefore the tongue cannot perform its own proper function... (Wingate 15)

Aristotle understood speech as expression of the soul and the mind. "Upon Aristotle's belief, the Stoic philosophers were to build their concept of speech as a manifestation of the logos, the divinely ordering principle implicit in the cosmos or Creation" (Benson 24). Plato's aforementioned thoughts on speech speaks to the beginning of the spiritual connection between speech and the soul; arguably, this moment was when speech and communication disorders began to be thought of as more than a physical function.

The case of Demosthenes (384-322 BCE) and his speech therapist Satyrus will forever be one of the first forms of speech rehabilitation. Due to his stutter, Demosthenes originally wrote speeches for other people, some of whom worked in government. His speech therapist Satyrus instructed him to "labor up steep inclines with lead plates strapped to his chest and to declaim over the ocean with pebbles in his mouth" (Bobrick 20). Finally, at the age of 30, he stood up at the Athenian Assembly to argue his reasoning for the city to reassemble its Navy to protect them from the rumored Persian attack. His speech was tight and clear. He wanted them to reinstate the navy whilst trying to resolve Persian conflicts diplomatically. He proposed a new tax to aide in financing his plan. From then on, his career was strictly handling matters of Athenian foreign policy.

Avicenna to 1700

The middle ages through 1700, like those of aphasia, contributed very minimally to the study of stuttering. Physicians mainly followed the doctrine of the humors well into the 15th century. The surge of religion (Christianity specifically but including all religions) impacted the way society treated the disabled--from creatures to fear to objects of charity. A few notable authorities are Avicenna from Bukhara (c. 980 AD), John of Gaddesden, Lanfranc of Milan (1270), and Bernard of Gordon (c. early 14th century). Avicenna redefined stuttering as the inability to say a word "unless one or more of its component syllables are repeated several times" (Bobrick 54). He thought deep breaths and surgery on the tongue were the best forms of rehabilitation. Chaucer and Edward III spoke highly of the stuttering work of John Gaddesden. His form of treatment was of a more pharmaceutical nature. He prescribed a medicinal lozenge of an antispasmodic to be dissolved under the tongue and rubbing of the tongue with nasturtium juice (Bobrick 55). Lanfranc of Milan was an Italian doctor, later moved to France and became a father of French surgery. He preferred surgery with a hot razor as the best form of treatment. Last but not least, Bernard of Gordon's primary interest was in the language development of children. He lectured on medicine at Montpellier. He observed that "there is a period in the lives of all children when they become 'nonfluent' and are unable to say what they want to say without stammering. This usually occurs between the ages of two and four when their speech is in the process of becoming more complex and their grammar and vocabulary more sophisticated" (Bobrick 55). His notes on child language development are accurate enough to qualify to be in a modern textbook on stuttering. As can be seen, the contributions of the middle ages mainly consisted of observations and out-of-date treatments.

In 1583, Hieronymus Mercurialis published his work *Treatises on the Diseases of Children*, which includes a section on speech defects (Rieber & Wollock 1977). He suggests stuttering is due to a synchronization failure of the processes of thinking and speaking. He praises Aristotle's explanation of how one's humor imbalances caused a temperament shift, and due to the characteristics of this temperament shift, one's speech in affected:

> It seems to me that Aristotle explained this better than anyone else in that passage, Problems xi, 38, where, asking why the hesitant of tongue were melancholics, he wrote that all melancholics have quick motions of the imagination, and that [stutterers] therefore, since they do have these quick motions, are melancholy as well. He says also, moreover, that [stutterers] have quick motions because, since the instruments of the tongue itself are weak, and cannot exactly follow the concepts of the mind, it happens that the mind's motions always anticipate those of the tongue, and hence the impediment of tongue. (Rieber & Wollock 1977).

Attempts to explain this phenomenon reappear in every period. Mercurialis concentrated his research on differentiating the numerous communication disorders. He carefully diagnosed his patients and prescribed an eclectic array of treatments for the various diagnoses. For example, if the patient's stutter was, in his opinion, due to dryness, he would add moisture to the body. He treated the symptoms as well as the suspected cause (Rieber & Wollock 1977). He was a fan of psychotherapeutic techniques such as trepidation to avoid fear. Fear had been attributed to the cause of stuttering for centuries at this point in time, and it still continues to be associated as a factor of stuttering. Mercurialis thought fear aggravated stuttering and causing one's speech mechanisms to become cold. Thus, trepidation was thought to help the patient face fear. He also advised only males to sustain from sex and women should not bathe the head of children with a

stutter because of the excess moisture (Rieber & Wollock 1977). More of his professional instructions involve regular bowel movements, moderate amounts of wine, salty and sharp foods (no nuts, fish, or pastries), etc. Avoiding such things would warm and dry the body's system, he thought.

Sir Francis Bacon (1561-1626) was a British philosopher, known as the father of experimental science for his principles of induction. It is worth briefly mentioning that even though Bacon did not directly contribute to the theory of stuttering, his advancements in scientific experimentation opened up possibilities for more extensive, systematic research.

18th Century

The eighteenth century proved to be a significant turning point for not only speech language pathology but also humanity, politics, and education. The American Revolution, the French Revolution, and human rights revolutions all took place within this century. Key literary figures of this time included, but are not limited to, Voltaire, Thomas Paine, William Blake, Mary Wollstonecraft, Johann Wolfgang von Goethe, Samuel Richardson, Ottobah Cugoano, Jean Jacques Rousseau, etc. The 18th century focused on the universality of bodily faculties. The classification of diseases (nosology), psychology, pathological anatomy, and pedagogical techniques all saw monumental advancements. Psychology focused on the mind's relationship to the body, specifically the connection of the mind's ideas and sensory-motor processes. Pathological anatomy refers to the diligent observation and recording of diseases and their effect on the body. Pedagogical techniques reference the increase in rehabilitation efforts and exercises incentivized by phoneticians work with the deaf.

Johann K. Amman (1667-1724) was a Swiss doctor who is known for his work with the deaf. In his work with stuttering, which he referred to as "hesitantia," he concentrated on methods to control the tongue (Wingate 35). He was the first written record to think of stuttering as a "bad habit" (Wingate 35).

Periodicals published in the American colonies from 1720-1765 make references to stuttering. Unfortunately, all of them are announcements asking for assistance in locating runaway slaves; stutters were descriptive attributes of the wanted individuals (Wingate 36).

Cotton Mather is the most noted person who stutters in Colonia America. His stutter interfered with his joining the ministry. He and his father tried praying his stutter away. He studied medicine, and in 1724 wrote a treaty containing the first medical account of stuttering in America (Wingate 36). Eventually, his stutter diminished enough for him to join the ministry.

Thomas Sheridan (1762), Boissier de Sauvages (1768), and William Cullen (1775) are two nosologists who attempted to resolve the murky and ambiguous nature of the terminology of communication disorders. Sheridan was the first to use the English term "cluttering speech" to refer to clinical cluttering (Rieber & Wollock 1977). Boissier de Sauvages categorized all speech and communication disorders into four temperaments:

> 1. Mutitas, which today is analogous to organic articulatory disorders 2. Aphonia, which is similar to organic disorders that result in the loss of the voice. 3. Psellismus, including what we today call disorders of rate and rhythm (stuttering and cluttering), but also various functional articulation defects. 4. Paraphonia, an entity similar to defects of vocal quality. (Rieber & Wollock 1977)

He described the etiology, anatomy, and therapeutics behind each defect, surpassing the symptomatology of predecessor Felix Platter (1656). William Cullen improved on Sauvages' work by condensing them into two clinical entities--the sanguine and melancholic.

Erasmus Darwin (1731-1802), grandfather to the biologist, was a nosologist, physician, and psychologist. Darwin himself had a severe stutter, but he believed his speech defect gained him recognition and attention in his quest to become a doctor (Bobrick 80). He was described by colleagues as having a ravenous love for life and cheerful attitude (Bobrick 79). Having many lovers during his life coupled with his erotic poetry on Linnaean botany in his book *The Botanic Garden*, it was safe to say his translation of an epigram was his life motto: "Wine, women, warmth, against our lives combine, / But what is life without warmth, women, wine" (Bobrick 81). An associationist by practice, he classified diseases upon the notion that motions affect the body: "irritations excited by external factors; sensation aroused by pleasure or pain; volition aroused by desire or aversion; or associations that could be linked with other movements" (Rieber & Wollock 1977). His speech therapy was highly ahead of its time; his advanced understanding of speech mechanics led him to divide speech sounds into four categories: vowels, sibilants, semi-vocals, and consonants (Bobrick 83). With moderate accuracy, he described the articulation of each.

Giovanni Battista Morgagni (1682-1771) was the father of pathological anatomy. He and Johann Gottfried Hahn, a German physician, believed stuttering was due to deviations in the hyoid bone, a u-shaped bone in the back muscles of the tongue connected by ligaments to the base of the skull (Bobrick 61). He experimented with autopsy examinations of the larynx in deceased patients with a stutter. His idea was contrary to Galen's beliefs that speech and voice defects are different. Morgagni described pathological changes in his patients using his

topographic classification system (Rieber & Wollock 1977). In his book, *Seats and Causes of Diseases*, he has a diligent section dedicated to recording many well-known speech disorders. He mistakenly assumed the unusual variations in the hyoid bone caused stuttering, but there is no set organ for speech since it is a function of the entire body. Although, Morgagni was one of the first to describe scientific data.

Associationists think of mental processes in terms of analysis. The associationism law of "contiguity" observed that when two objects/ideas are thought of together or one before the other, they become linked or associated. Psychologists of this school of thought were very much interested in how simple ideas work together and form complex ideas. Therefore, David Hartley, Moses Mendelssohn, and Erasmus Darwin paid much research to normal and abnormal development of speech and language in children.

Philosopher-psychologist, David Hartley (1749) investigated how internal feelings stimulated by external factors (sensations) and ideas associate with simple brain states (vibrations) (Rieber & Wollock 1977). Hartley thought the power of association was a process in which simple sounds link together to make a whole word, sentence, etc. He recorded his findings on auditory images, relating them to child speech and language development. More specifically, "He believed children learn to speak by repeating the sounds that stimulate the organism to respond" (Rieber & Wollock 1977). Therefore, according to Hartley, fear, eagerness, or violent passions develop into a stutter. The fear disrupts the vibrations neural pathways to the speech mechanism, so the patient repeats himself until the vibration is restored. He did place a loose age limit to the development of a stutter stating that the problem would not arise until the child is able to recognize correct and incorrect pronunciation of speech sounds. Hartley's work on

stuttering and speech paved a foundation for future aphasiology, which is just another example of how interconnected the two histories were.

In volume one of the first periodical to deal only with psychological issues, there was an article reporting on transitory sensory motor aphasia, and in the same issue, Moses Mendelssohn (1783) wrote a paper with his interpretation of aphasia report and his theory for stuttering. His theory implies a subconscious relationship of thought and speech. Although this is not a new acknowledgement, he saw stuttering as "a collision between many ideas flowing simultaneously from the brain" (Bobrick 78). Mendelssohn, grandfather to influential composer Felix Mendelssohn, had a stutter as well. He playfully described his speech impediment in a poem:

> Great you call Demosthenes,
> Stuttering orator of Greece;
> Hunchbacked Aesop you deem wise;—
> In your circle I surmise
> I am doubly wise and great.
> What in each was separate
> You in me united find—
> Hump and heavy tongue combined. (Bobrick 78)

Even though the colleagues and friends of Mendelssohn and Darwin enjoyed their presence, a huge portion of society held negative assumptions and judgements towards people with speech disorders. Working to show that they are humans whose intellectual capabilities were unimpaired by their speech disorder, John Herries improved the conditions and attitudes towards those with speech and communication disorders. An elocutionist, he published his book *The Elements of Speech* in 1773. Herries also faced discrimination for his dialect as a Scotchman, resulting in negative comments on his work. Regardless, his book became a popular resource to be used widely. He described how each of the articulators have a function that affects

speech production. He felt strongly that a good knowledge on the voice and articulatory processes are required to be a good orator.

19th Century

The 18th century focused on connecting universal faculties such as stuttering to a speech organ as in Morgagni; whereas, the philosophy of stuttering experienced a paradigm shift towards the direction of individual and unique features of speech disorders. More importantly, a focus is placed on the processes of the brain, localization of language faculties, and attributing speech disorders to breakdowns in such faculties. Special education, the American Speech and Hearing Association (est. 1925) and the official profession of Speech Language Pathology all emerged during the 19th century. This century introduced a vast diversity of perspectives and research on the multitude of speech and communication disorders, particularly in regards to stuttering. Because of this, an extensive explanation of each perspective and its contribution to the study of stuttering is a project for a future paper. This reason coupled with the fact that a few main movers and shakers in SLP (i.e. Franz Josef Gall, Paul Broca, Carl Wernicke, etc.) were aforementioned in Chapter 1 led to the condensation of this century into a handful of vital SLP's and their work.

John Thelwall (1810-1814) was an underappreciated figure in the elocutionary movement that began in the 18th century. Thelwall approached the movement from a scientific standpoint. His approach to understanding speech and hearing disorders exhibits sensitivity and sophistication similar to the writings of Van Helmont (1667), Darwin (1796), Hartley (1749), etc. Thelwall also took much care in fulling understanding the various levels of etiology for stuttering. He additionally, familiarized himself with the issues regarding mental retardation and

distinguishing it from "emotional disturbances" (Rieber & Wollock 1977). His best works of speech pathology are his books *Letter to Henry Cline on Imperfect Development of the Faculties Mental and Moral* (1810) and *Results of Experience in the Treatment of Causes of Defective Utterance* (1814). His most recent work shows how therapy elicits better responses in some children with speech disorders when working with a female therapist over a male therapist.

Edward Warren (1802-1878) was the first American to publish a paper about stuttering. His grandfather John Warren and father John Collins Warren were both well-respected surgeons. Consequently, he graduated from Harvard and became a surgeon. Edward appreciated the individuality of stuttering as a condition noting how it varies depending on the patient and may even disappear. He believed stuttering to be a complex disorder originating during childhood (potentially before birth, he thought). He deemed it a defect of the nervous system--both mentally and physically caused. Monumentally, Warren distinguished two symptoms of stuttering; today, the terms to describe such a distinction are tonic and clonic. Clonic medically means "characterized by alternate contraction and relaxation of muscles," which translates to stuttering as repetitive oscillations and iterations of words or syllables (Wingate 218). Tonic's medical meaning is "state of sustained muscular contraction," which translates to stuttering as prolongations and blocks in speech (Wingate 223). Returning to the notion of patients' temperaments affecting their speech, Warren noted the personalities of his patients to support his theory that stutterers are of "nervous temperament" (Rieber & Wollock 1977). The humoral system had been long disproven at this point due to advancements in anatomy, but the temperaments theory was still rarely used. Moral treatment emerged from the 18th century connection of philosophy and psychology to emotions. Moral treatment attempted to balance one's emotions and will since his will to speak was impaired by his emotions.

Another authority on balancing one's will for stutter therapy, Andrew Comstock (1841) was an American doctor. He thought stuttering to be psychological because of the ineptitude of the mind to "obey the commands of the will" (Rieber & Wollock 1977). He prescribed a regimen of physical therapy exercises for patients' speech behavior rehabilitation.

The industrial revolution acted as a catalyst for the invention of mechanical devices to aide in speech therapy. A prime example of such devices is a "do-it-yourself therapy kit" that the Committee of Science and Arts of the Franklin Institute supported in 1854 (Rieber & Wollock 1977). The kit was to cure stuttering with tube for articulation and collar-belts for spasms.

Johann Dieffenbach (1840), a German surgeon, was infamous for his surgical treatments of the tongue as a cure for stuttering. He was highly respected and his work died off because no one else could recreate his procedures. He believed spasms of the tongue to be the cause of stuttering much like his predecessors dating back to antiquity. "His treatment consisted of making a horizontal surgical, incision at the root of the tongue. His next step was to make a triangular wedge across the tongue, thereby dividing the lingual muscles" (Rieber & Wollock 1977). To him, this would improve control over the tongue and vocal folds.

The end of the 19th century brought an emergence of professionalism, in America specifically. The demand to be a highly respected professional (whether it be in medicine, social work, education, etc.) was sought after and competitive. Thus, arose the need to define professional qualifications, jurisdiction, and an educational system in order to build a monopoly over a specific occupation. Medicine, special education, and logopedics reorganized their practice the most, molding themselves towards the fields of study we know them as today.

20th Century-Modern Day

This section focused on the important research contributing to the etiology, typical onset age, speech characteristics, diagnosis, and treatments of developmental stuttering in children. There are currently many characterizations of stuttering. Namely, there is developmental, neurogenic, psychogenic, and cluttering forms of stutters. Cluttering differs from stuttering in a few important ways. First, the etiology of cluttering is most likely neurological and potentially due to dysfunction in the basal ganglia (Guitar 327). The typical onset age varies from preschool to mainly school-aged children. Cluttering consists of fast speech, fillers, incomplete phrases, repeated words/phrases, and hesitations. These are all classified as normal disfluencies. It is often comorbid with stuttering and other learning disabilities (i.e. attention, reading, writing, and auditory processing deficits) (Guitar 331).

Dean Williams, a professor of speech language pathology at the University of Iowa, researched his philosophy and perspective of stuttering. His former students Robert W. Quesal and J. Scott Yaruss wrote an article (*Historical Perspectives on Stuttering: Dean Williams*) describing in detail William's definitions and treatments of his work in 1951. William's work, commonly referred to as "Forward Moving Speech" is additionally known as the Iowa model of therapy (Quesal & Yaruss 2000). Williams had many philosophical contributions to stutter therapy; one of his main contributions was his five parameters of forward moving speech. The five parameters are necessary foundations for the smooth flow of speech. Airflow affects the muscular control and relaxation pressure differently in breathing for life and breathing for speech. Movement involves all of the speech structures: lips, jaw, tongue, soft palate, rib cage, and abdomen. "Precise timing is also important for the activation of muscles needed to achieve the intricate relationship between the movements of various articulators" (Quesal & Yaruss

2000). Voice onset time is a great indication of the timing of one's speech, which is somewhat different than one's speaking rate, in that, if one slows their speaking rate, it changes their timing and movements. Speech consists of a variety of voiced or voiceless sounds. Difficulty initiating, maintaining, or transitioning from voiceless to voiced sounds (or vice versa) can be at the root of one's stutter. Lastly, tensing controls some of the articulators' movements. Williams stresses the difference between "physical tensing" and "emotional tension"; "tensing refers to the muscular effort for pressure, whereas tension refers to an uncomfortable emotional state" (Quesal & Yaruss 2000). He explains how all of the five parameters maintain an interconnected relationship, and in order to provide effective therapy one must increase the client's awareness of the parameters and which ones affect his individual speech deficit.

Five main theoretical perspectives on the constitutional factors in stuttering explain how the work of the 20th century is still prevalent today. These perspectives see stuttering as a disorder of brain organization, disorder of timing, reduced capacity for internal modeling, a language production deficit, and a multifactorial, dynamic disorder. Neurologist Samuel Orton and psychologist and speech pathologist Lee Edward Travis support the theory of stuttering as a disorder of brain organization. In a 1920 study, they hypothesized that stuttering was due to a lack of hemispheric dominance. They observed stutterers who used to be left-handed, and their parents changed them to being right-handed. This change, they suspected, caused conflicts in their control of speech so that neither hemisphere was completely in charge. Thus, this caused neuromotor disorganization and mistiming in speech, resulting in stuttering (Guitar 91). Their treatment was to simply switch the children back into left-handers.

R. D. Kent (1984) hypothesized that stuttering is due to a deficit in temporal programming. He, like Van Riper (1982), believed stuttering was a disorder of timing. Van Riper

described how “when a person stutters on a word, there is a temporal disruption of the simultaneous and successive programming of muscular movements required to produce one of the word’s integrated sounds…” (Van Riper 1982). Kent’s work speculates that the programming issue was due to the improper localization of speech and language functions “to the right hemisphere that results in an inability to create the precise timing patterns needed to perceive and produce speech efficiently” (Guitar 92). An equivalent analogy would be to the responsibilities of speed and tempo of a conductor and the brain coordinating the complex timing and relationships between phonemes, syllables, and phrases.

Another perspective on stuttering, specifically as a reduced capacity for internal modeling was advanced by Megan and Peter Neilson (1987). Their research suggests that the repetitions in stutterer’s speech are because of the inability to create and use an “inverse internal model of the speech production system” (Guitar 92). Focusing on language and speech development of children, if the children with a stutter have difficulty learning the dynamics between their target sounds and movements required to produce speech, they would then have trouble transforming the sensory-to-motor and motor-to-sensory tracks.

The last two theories are on stuttering as a language production deficit and as a multifactorial dynamic disorder. Stuttering may be attributed to the latter because various factors like genetics, emotions, cognition, social, and environmental could simultaneously occur. Nonetheless, the modern classification of the generic stutter is comprised of a neurophysiological (anomalies in the left hemisphere) etiology exacerbated by temperament and environment (Guitar 331). The typical onset age is usually between the ages of two and five, but some children develop stutters into their school-age years. The speech characteristics of a stutter are single-syllable whole-word repetitions, part-word repetitions, prolongations, and blocks (Guitar

331). Working as a SLP aide for children with various speech and communication disorders, I have learned that an important aspect of stuttering is frequency. Frequency is usually more than 3% of the syllables stuttered to be classified as a stutter. The proportion of the stuttered syllables to the total number of syllables spoken yields the percentage of syllables stuttered in an utterance or speech sample. This is important data to collect not only for baseline data but also throughout the progression of the speech therapy. Secondary behaviors such as escape and avoidance are common, although they manifest in different way depending on the individual.

D. A. Weiss presented her report on the *Therapy of Cluttering* in 1960 at the 11th International Convention of the International Society of Logopedics and Phoniatrics in London. By her research, cluttering is a "central language imbalance" behind a number of speech and voice problems, especially that of stuttering (Weiss 217). It is an important root of some developmental stuttering cases, and E.E.G. investigations show characteristics of cluttering (i.e. tracing and peculiarities in brain physiology) to be both sensory and motor in nature (Weiss 217). Cluttering is not solely separated into these two categories; however, it can also be categorized as resembling transcortical aphasia. Because of this, Weiss noted a few of her most vital and effective forms of clutter therapy. She strongly advocated for poetry therapy as a form of treatment. First, it benefits the symptom of tachylalia (hurried speech); the patient is to perform syllabic speaking, which consists of separating the syllables giving each equal importance (Weiss 219). Secondly, allowing the patient to over-articulate and over-emphasize the accentuated words and syllables help improve monotony, lack of rhythm, and articulation. Thirdly, poetry improves the patient's vocabulary which tends to be studded with misunderstood words. First copying then, eventually, memorizing poems and having the patients recite them allows the patients to control speed, articulation, rhythm, melody, sentence structure, and

vocabulary (Weiss 220). Fourthly, poetry therapy improves the patient's formulation of sentence structures. Weiss states, "the exaggerated melodic line seems to represent an empty mold which cries for being filled out with words and phrases in good order" (Weiss 220). Indeed, it does; try reading a poem in iambic pentameter without the melody. Lastly, Weiss argues at poetry's ability to improve the attention span and concentration levels of her patients who clutter (Weiss 223). Reading, reciting, and composing poetry as a form of rehabilitation not only has the aforementioned health benefits, but it also gives the patient an opportunity to reclaim his power over his independence and individualized voice. For instance, poet Adam Giannelli has had a stutter since he was a child. It was his speech and communication disorder that led him to poetry.

Stuttering is one of the most well-known and yet most heavily debated speech and communication disorders. Beginning with the first, simple references to stuttering in the Bible and Ancient Egyptian, Greek, Roman, and Indian texts, stuttering was originally thought of as a reflection of poor intelligence. This negative assumption still persists even today in society. Medically, it was not until the 18th century with the advancements in psychology that this assumption was discredited officially. The Ancient Greek and Roman treatments were incorrectly based on the 4 humors, a theory that persisted for many centuries. Regardless of their accuracy, the research conducted until the 18th century documented thought processes regarding the relationships between language, speech, and the body. The 19th century saw many revolutionary progressions in medicine, society, and SLP. The industrial revolution forever changed the forms and accessibility of speech therapies offered. The effects of the elocutionary movement humanized societies view of those with a speech and communication disorder thanks to the work of John Thelwall, among others. The turn of the century saw an increase in professionalism and research, shaping SLP and defining key principles of stuttering.

Chapter 4: Stutter Poetry

Adam Giannelli's "Stutter"

since I couldn't say *tomorrow*
I said *Wednesday*

since I couldn't say *Cleveland* I said
Ohio
since I couldn't say *hello*

I hung up
since I couldn't say *burger*

a waitress finished
my sentence

a green-striped mint
dissolved

on my tongue
from peacock to dove

since I couldn't say my name
I opened

as if preparing for a throat

culture
since I couldn't say my name
I sat there

since I couldn't say *water*
I drank
I could speak as camouflage
as in a Greek play or firing squad

so I stood in a row and pledged
allegiance in chorus

since I couldn't say *dynamite*
my mother
drove me to hearing and speech

each Tuesday
since she knew
I couldn't say *butter the bread*

she stopped on the way
home for Italian ice at Corbo's

since I couldn't say *pistachio*
I ordered *hazelnut*

I could say vowels so

I said *easy does it*

I always said *easy does it*

I said

all aboard

since I can't say *everlasting*

I say *every*

lost thing

alone in my room I can

speak any word

since I can't say *memory* I say

underbloom

and under me

a mulberry tree

a puddle shorn from the storm

Adam Giannelli's poem "Stutter" demonstrates the inner turmoil of those with a stutter. He was diagnosed with a stutter since his childhood. Although it was his stutter that guided him to writing poetry, "Stutter" was his first time he ever wrote about it. It is common for children and young adults with a stutter to experience fluctuations in their fluency; often times, highly stressful or transitional periods of one's life can cause an increase in its activity. Delving deeper into the poem, even though it is about this speech and communication disorder, the speaker never actually stutters. Giannelli intentionally chose to not represent the stuttering orthographically in order to take the reader into the mindset of the speaker. Giannelli describes the iceberg metaphor for stuttering:

> The physical stuttering makes up the tip, while the hidden base of the iceberg is composed of the fear and shame that accompany stuttering. I can often anticipate in advance which words I will stutter on, and people who stutter commonly substitute words that are easier to pronounce for more difficult ones. These substitutions and other covert behaviors are located in the base of the iceberg, since the average listener is unaware of them. (Giannelli)

He wanted to offer a glimpse into the daily life of one with this speech disorder. He shows throughout the poem how substitutions are made quite often. For instance, he exchanges *Wednesday* for *tomorrow*, *Hazelnut* for *pistachio*, and *every lost thing* for *everlasting* (Giannelli 1-2, 35-34, 41-43). The latter substitution transforms from a substitution to a wordplay and metaphor. *Every lost thing* points out not only the tendency of those with a stutter to avoid confronting words they cannot say, but it also highlights how all people censor themselves and compromise their true voice. Moreover, when he describes speaking as "camouflage...so [he] stood in a row and pledged allegiance in chorus," these lines reveal the shame and fear that

underlie stuttering and the actions taken to avoid embarrassment. Giannelli uses narrative writing and poetry to take back control of his voice. He is one of the many poets I have studied to gain knowledge, inspiration, and an ethical boundary for my own poetry in this chapter. Like Giannelli, I use persona poems to focus on the inner turmoil of not only those with the speech and communication disorder but also the perspectives of the Speech Language Pathologists and loved ones of a person with the stutter. It was important for me to incorporate and represent not only my experiences (working as an SLP aide at a rehabilitation hospital, teacher's assistant and SLP aide for children with various disabilities, and caring for my little brother with down syndrome) but the experiences of others as well. I focus on themes such as the social taboo of those with a disability, specific treatments and therapies used, socioeconomic factors, and other general adversities encountered in order to give a well-rounded experience from the multiple parties involved in one's language development.

Uncomfortable

"Don't stare!"
A mother says to her child,
Then turning to me,
"I'm sorry" and
after a long pause
She compliments my
strength with
a tone of admiration.
I could put on a superficial smile
accept my public role
appease her guilt
comfort *her*
for furthering the taboo of the disabled
disguising it behind the excuse of
teaching her child good manners.
Or
I could explain to her
how looking at family member
of those with a disability
as a hero
only embarrasses everyone
More.
Idealizing me as the
self-sacrificing,
uncomplaining,
happy sister
labels me as
a martyr.
This stranger's discomfort and *kindness*
appalls me,
and still,
the weight of the responsibility to
confront this social interaction is
Solely
on me or Brother.

Bubble

the above is

a. The sound I practice alone in my room
b. The thing I can reach but never speak
c. A source of anxiety
d. All of the above

Answer: Your first impression and all most will ever know about me.

Pen to Paper

I am a much better writer.

Pen to paper,

I am everything and anything

all in one.

I can even say

Pen to Paper

in four syllables straight.

Off the paper,

though,

I need more

More time to anticipate each word

more time when I am s-s-s-st-st-st-stuck-k

more rednes-s-s on my ch-cheeks

that inevitably comes.

More giiiiiiiggles and shame.

More sw-sw-sw-sw-swallowing to

re-repress the r-r-rep-

piiiitition,

by the time I get it out,

it loses its meaning.

S-so f-far S-sep-parrrated from

who I ac-actually am.

Hearsay

Alan Dugan describes my tongue as courageous.
Whereas Robert Burton, a miserable chap himself,
labels it as one of the first causes of melancholy.
My mom understands what I'm saying.
My teacher gets it too.
My best friend whose name I know but cannot say gets me too.
The others...not so much. It is a bunch of
"what'd you say?"
"Spit it out, kid!"
"I don't have all day"
"Can you say it again?"
"Huh?"
"what's wrong with you?"

Nothing, man, what's wrong with *you*?

A speech I was to give

amidst my doggy's funeral,
a s-s-speech I was to give
I look around, all eyes on me,

words s-so iiinvolutional,
how can I express how he lived
iiinevitable fool, I'll be.

wishing my voice was t-tunable,
emotion makes it more active
I struggled on, and n-nobody

noticed me s-s-stuttering
under all my loud bbblubbering.

Sessions

Today we work on imitations of monkey sounds to get
AJ to formulate vowels and to stretch
the muscles needed for such verbalization
He is not connected to this SLP yet
He exhibits more speech production at home with me,
Where he is comfortable, maybe we can arrange to
have his SLP sessions at the house. He doesn't know these walls.
He is probably cold and nervous
Looking into his watery eyes, filled with so much emotion
without the tools to express it
Chomsky's Poverty of Stimulus grips tighter
around the tongue of children with disabilities
The language children acquire is intricate and subtle,
and the sample of speech they hear
during the course of language development is
anything but.
Developmental stammering occurs
when the child's speech and language abilities are
unable to meet the child's verbal demands,
So they might swallow and blink,
Cry, head bang, body drop,
Avoid certain phrases or words,
Further limiting their already confined discourse.

Shower Thoughts

He needs his speech therapy sessions but even with insurance the copays add up week after week I have to drive him to my sister's before my first class so she can watch him until I'm out of work I need to drive from V's to school then to work then back to V's and back home I need gas money to make it to the store because he needs more diapers How much are his diapers again? I might as well pick up snacks and lunch for him to hold him over until dinner...Dinner! What am I going to make each day this week? Spaghetti tacos stir fry meatloaf and mashed potatoes I get paid next Friday, but he was sick last week so I had to miss those hours at work how much will I be short this paycheck? Oh shit I had to spend the gas money on his medication and prescription for his new glasses His specialist appointment is next week which has a more expensive copay than his normal appointments What time is it? I need to finish that paper and email it to my teacher by midnight. I hope brother goes to bed easily tonight.

Response Contingency Therapy

G-g-go-

Oops! That was bumpy; let's try again…

Go fffish!

Better! Did you feel stuck there?

nods head

That's okay. What color is this fish?

…

Gestures towards positive reinforcement toy

First work, then play...What color is this fish?

…

Orange.

No bumps on that one! Good talking! Now you have a break!
hands reinforcement toy to child, starts timer

Plays with toy, runs around room, timer beeps

Okay, work time!
refocuses child on task
What number is this?

One!

Wow! I like how smooth that was! One more question,
then it's time for lunch.
Okay, I want you to tell me the color *and* number:

Rrrred-

That is a little bumpy. Let's try again:

Red S-s-six-

Good job saying red! Give it one more try, please.

Red...Six

I love how smooth your words are! You did so well today!

The Ancient Egyptians treated aphasia by rubbing grease on the head and pouring milk in one's ears. Surgical intervention was attempted for both stuttering and aphasia; it was successful for aphasia with the extraction of bone from the brain but butchering the tongue to cure stuttering was not a credible solution. From lugging heavy materials uphill with pebbles in one's mouth to using psychotherapeutic trepidation treatment and scaring the stutter out of patients, these historic physicians tried creative therapies throughout their research. Nowadays, speech pathology is a textbook practice with outlined exercises and treatments for each diagnosis. However, the majority of the milestones in the histories of stuttering and aphasia lies not in major scientific breakthroughs but in the incorrect theories and misunderstandings.

Language is a precious privilege that we are all guilty of taking for granted. In order to appreciate the nature of something one must learn its history and intricacies. It was equally important to research the inaccurate theories and practices as it was to learn about the success stories. When working with an aphastic patient or a child with a stutter, mistakes comprise the greater portion of the sessions, with it comes frustration, impatience, and disappointment. Yet this is the very reason that the moments of improvement and success are so sweet and inspirational. Poetry is an art form closely connected to language that can offer more moments of sweetness. Using poetry as a tool for rehabilitation goes beyond treating a condition; it gives the patient the space to restore his freedom of communication and creativity.

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