

No Miracle Cures

A Multifactoral Guide to Stuttering Therapy



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Introduction

Different speech clinics, books, and websites provide conflicting information about stuttering treatments. Differing claims confuse consumers. The purpose of this book is to unconfuse consumers, enabling stutterers and parents of stutterers to make better decisions regarding treatment.

Three Eras of Stuttering Treatment

In the primordial past, stuttering treatments included tongue surgery, psychoanalysis, and speaking with a sing-song cadence or while rhythmically waving one's arm.

The Iowa Therapies

The modern era of stuttering treatment began in 1927 with the formation of the University of Iowa Speech Clinic. Lee Edward Travis, Bryng Bryngelson, Wendell Johnson, and Charles Van Riper developed what are now referred to as “the Iowa therapies,” including *indirect therapy* for children (page 33) and *stuttering modification therapy* for adults (page 150).

These treatments focused on accepting stuttering, reducing stutterers' speech-related fears and anxieties, and helping stutterers to communicate better despite stuttering. Techniques included voluntary stuttering, changing the language we use to talk about stuttering, improving awareness of one's stuttering behaviors, asking listeners what they thought about stuttering. Stuttering modification therapy also includes physical techniques, such as cancellations and pull-outs, but speech-language pathologists disagree as to whether these techniques are intended to result in fluent speech (page 5). Because they couldn't treat the core behav-

iors of stuttering, speech-language pathologists of this era managed the secondary symptoms associated with stuttering, to improve stutterers ability to communicate, despite stuttering.

Indirect therapy has been proven ineffective for helping children (page 33). Efficacy studies have found that stuttering modification therapy has little or no long-term effect on stuttering (page 155). The effect on speech-related fears and anxieties is more difficult to measure, and many adult stutterers say that stuttering modification therapy has provided long-lasting improvement in their lives.

Fluency Shaping Therapy

The second era of stuttering treatment began in 1965 when Israel Goldiamond discovered that using an electronic *delayed auditory feedback* (DAF) device, with which a user hears his voice delayed a fraction of a second, induced stutterers to speak slowly and fluently. Goldiamond developed a stuttering treatment that began by inducing slow, fluent speech with DAF; then gradually attenuating the DAF until the stutterer was speaking slowly and fluently without the DAF; then gradually increasing the speaking rate until the subjects spoke fluently at normal speaking rates.

Fluency shaping therapy was further developed by Richard Curlee, William Perkins, Bruce Ryan, and other speech-language pathologists during the 1970s. They developed treatments for the core behaviors of stuttering, training even severe stutterers to talk fluently. DAF was dropped from most fluency shaping programs and now speech-language pathologists train stutterers to talk slowly and fluently without using DAF. Fluency shaping programs typically ignore secondary stuttering behaviors, including speech-related fears and anxieties, assuming that these will disappear if the stutterer learns to speak fluently.

Fluency shaping therapy trains conscious awareness and control of speech processes that are normally automatic. Too often the result is that a stutterer can think about *how* he is speaking, and speak fluently; or think about *what* he is saying, and revert back to

stuttering (a *dual-tasking* problem). Fluency shaping therapy has a reputation for producing fluency in low-stress conversations in speech clinics; and being ineffective in high stress situations outside the speech clinic. A chapter of this book (“Beyond Fluency Shaping,” page 110) is about making fluent speech automatic and effortless, but the ideas in that chapter are mine, not from mainstream fluency shaping programs.

Neurological Treatments

The neurological era of stuttering treatment began in 1992 when the first brain scan study of stutterers was published. This and later studies found neurological abnormalities during stuttering. Some of these abnormalities, such as underactive auditory processing, were unexpected.

In 1993, Joseph Kalinowski, Andrew Stuart, Michael Rastatter and colleagues published a study finding that DAF and a newer technology called *frequency-altered auditory feedback* (FAF) reduced stuttering at normal and faster-than-normal speaking rates, without conscious effort or control. This challenged the belief of the fluency shaping era that slowing down was the key to fluent speech, and suggested that altered auditory feedback may correct a neurological abnormality, possibly an auditory processing abnormality.

In 1999 Gerald Maguire and colleagues published a study finding that the dopamine antagonist medication *risperidone* reduced stuttering.¹ Maguire’s team later found that similar medications are also effective.

In 2005 Ehud Yairi and Nicoline Ambrose published the results of longitudinal studies examining young children soon after the onset of stuttering, and following the development of the disorder for five years or more. The results dispelled many myths and suggested that stuttering begins when different areas of a child’s brain develop faster or slower (page 26).

Researchers have linked stuttering to specific genes (page 72).

Neurological treatments reduce stuttering without conscious

effort, control, or training. Neurological treatments ignore both core stuttering behaviors and secondary behaviors, including speech-related fears and anxieties, in the belief that correcting the neurological abnormalities leads to fluent speech and the disappearance of secondary behaviors.

As an example of “neurological era” thinking, the following letter was written in 2007 by Joseph Kalinowski and Tim Saltuklaroglu. Kalinowski was one of the developers of the SpeechEasy DAF/FAF hearing aid-style anti-stuttering device:

For the last 40 years, practitioners of stuttering therapy have advocated systematic retraining of the peripheral speech mechanism in an attempt to create speech movements believed to be incompatible with stuttering. Such re-training has often resulted in “pseudofluent” or “labored” speech, characterized by unnaturalness, droning, and conspicuousness. Further, these new speech patterns have shown a strong history of instability and propensity for relapse, despite the countless hours taken to establish them...

...the major corpus of current evidence suggests, and most “experts” now concur, that stuttering is an involuntary central neurological disorder. Therefore, logically speaking, attempting to combat the disorder by altering speech patterns without attacking the source of the pathology seems only to provide temporary relief from the overt symptoms of stuttering. As such, these methods appear to be largely inefficient in treating the disorder, a contention that is obvious to most and most notably to the person who stutters.

Our research group suggests that stuttering can be inhibited at a central level, closer to its source, [with the result that] disruptions of stuttering are usually totally absent [by using] delayed auditory feedback (DAF) and frequency altered feedback (FAF)...

Prosthetic devices (e.g., all-in-the-ear fluency aids) that emulate choral speech (by using DAF and FAF) seem promising, and pharmacological agents for general inhibition also show potential...The data is

irrefutable—current stuttering therapies have fallen short of their promises, and stuttering inhibition should be further explored.²

Neurological era treatments tend to be more promise than proven. Too often the neurological processes of stuttering are only barely glimpsed. The early childhood research has not yet led to a new, more effective treatment for early childhood stuttering. The genetic research is controversial. Anti-stuttering medications, in general, are barely effective and/or have severe side effects. As a developer of electronic anti-stuttering devices I feel frustrated that technological advances are years (sometimes decades) ahead of efficacy research.

The thesis of this book is that each era of stuttering treatment has contributed to the field, that each has shortcomings and each treatment alone is insufficient, and that the successful treatment of adult stuttering requires combining treatments from all three eras.

Why Stuttering Experts Don't Agree

A 2005 study of a stuttering modification therapy program found that immediately post-treatment subjects' speech improved on average 10%. Six months later this gain had all but disappeared. Several measures of anxiety found 10-15% psychological improvements, after six months. The researchers concluded that the program "...appears to be ineffective in producing durable improvements in stuttering behaviors."³

Three speech-language pathologists wrote letters to the journal objecting to the study. Bruce Ryan, a developer of fluency shaping therapy in the 1970s, wrote:

As to the goal of treatment, I have to respectfully disagree with the authors' statement that "...reduced frequency of stuttering was not an overt goal of the [therapy program]"...Fluency, or at least very good management of stuttering, was one of Van Riper's main

goals to be attained in- and out-of-clinic. This is what he advocated when I was with him as a student in 1956–1957 and it is what he had written in his books. Fluency is at least one goal of the SSMP as I read the manual, or why the use of prolongations, cancellations, and so on to modify the speech? From [the book *The Treatment of Stuttering*, by Charles] Van Riper, “We tell him [the person who stutters] that some stutterers achieve complete fluency, at least equal to that characteristic of most normal speakers.”⁴

Peter Reitzes and Gregory Snyder, who are practitioners of stuttering modification therapy, wrote:

we argue that [the efficacy study] may be inappropriate relative to the stated therapeutic goals...Specifically, these goals include approaching stuttering in nonavoidant ways and using stuttering modification strategies to move forward through moments of stuttering. As a result, a valid and important therapeutic objective for some clients who participate in...stuttering modification approaches may include increasing overt stuttering frequency as a means of desensitization to the fear of stuttering and reducing covert stuttering behaviors. As [Walter] Manning has written, “Increased stuttering usually occurs with decreased avoidance. So, under certain circumstances, one sign of [therapeutic] progress could very well be an increase in the frequency of stuttering.” Consequently, the use of stuttering frequency as an indicator of treatment efficacy may be an inappropriate and insensitive measurement relative to the treatment efficacy of...stuttering modification based therapies.⁵

Dividing stuttering treatments into three eras is an exercise in *hindsight bias*. To make three neat categories of treatments I’m emphasizing some facts and ignoring others. The goal of Travis, Bryngelson, Johnson, and Van Riper was fluent speech. They tried to develop a neurological treatment based on “confused or am-

biguous lateral dominance,”⁶ e.g. forcing left-handed stutterers to use their right hands. This didn’t work. They tried to train stutterers to talk fluently, using cancellations, pull-outs, etc. This was also unsuccessful. They tried to reduce stutterers’ speech-related fears and anxieties, and were successful. Today, practitioners of stuttering modification therapy, such as Reitzes and Snyder, argue that fluent speech is not the goal of their therapy, but rather their goal is to reduce speech-related fears and anxieties and improve communication.

Cognitive Biases

Cognitive biases are mental shortcuts (or *heuristics*) we use to make decisions or to persuade other people to agree with our point of view, when we lack complete information or when we have too much information and lack the time to examine all of it. More than one hundred cognitive biases have been identified.⁷

Cognitive biases can help us reach correct conclusions, e.g., my first digital camera was made by Canon, I was happy with it, since then I’ve only considered Canon when buying digital cameras, I’ve been happy with all the cameras I’ve bought, and I’ve recommended Canon cameras to my friends and they’ve been happy.

But cognitive biases can also lead to wrong conclusions and to make bad decisions. For example, my first stuttering treatment was a fluency shaping program in 1981, when I was nineteen years old. I learned to speak slowly but fluently in the speech clinic. I was unable to use this fluent speech in conversations outside the speech clinic (the therapy failed at the *transfer* stage). In 1984 I did a “refresher” of the same program and this time was able to speak fluently outside of the speech clinic—for three days. Then my stuttering returned.

In 1990 I tried speech therapy again, with a recent Ph.D. speech-language pathologist who’d written her dissertation on stuttering. Twice a week she spent an hour telling me that adult stutterers with my severity can never talk fluently, and that I must accept that I would be a stutterer for the rest of my life. I objected that this

wasn't true, that I'd learned to talk fluently at another speech clinic. She kept telling me to change my goals to accommodate stuttering. I quit seeing her after six weeks.

Confirmation bias is the interpretation of information to support one's preconceived ideas. From her point of view, I'd done two fluency shaping programs and I still stuttered, proving her belief that fluency shaping therapy doesn't work. From her point of view, I'd been taught some tricks that produced fluency only in the speech clinic, or just temporarily outside the speech clinic. To her, I was proof that the core behaviors of stuttering are immutable. To her, my only hope was to change my attitude and my goals and learn to communicate despite stuttering. To her, the Iowa therapies were the truth and fluency shaping was smoke and mirrors.

From my point of view, I was certain that I could talk fluently. I'd done it twice, and I knew I could do it again, if I could find a speech-language pathologist to teach me. I didn't want to accept stuttering. I'd didn't want to b-b-b-bounce through v-v-v-voluntary st-st-st-stuttering. I didn't want to analyze video tapes of my stuttering, or listen to group therapy debates about whether we were "stutterers" or "persons who stutter" or "persons who sometimes stutter."⁸ I believed that fluency shaping therapy was the modern method and stuttering modification therapy was out of date and ineffective.

Another type of cognitive bias is *ingroup bias* or the *bandwagon effect*. This cognitive bias occurs when an individual makes a decision (e.g., recommending a stuttering treatment) based on what other people do, especially what other members of one's group do.

Experts studying misguided [medical] care have recently concluded that the majority of errors are due to flaws in physician thinking, not technical mistakes. In one study of misdiagnoses that caused serious harm to patients, some 80 percent could be accounted for by a cascade of cognitive errors...Another study of one hundred incorrect diagnoses found that inadequate medical

knowledge was the reason for error in only four instances. The doctors didn't stumble because of their ignorance of clinical facts; rather, they missed diagnoses because they fell into cognitive traps.⁹

Cognitive biases are why intelligent, educated, respected experts can't agree. Experts make mistakes, such as recommending ineffective treatments, not because not enough studies have been done or because not enough books have been written. Experts fail because cognitive biases skew their thinking.

Well-Structured and Loosely Structured Fields

Well-structured fields have observable phenomena, enabling anyone to judge whether a hypothesis is correct.¹⁰ Examples include math, physics, and computer science. Well-structured fields have clearly defined terms and rules that everyone agrees on (e.g., the laws of physics). Persons in these fields easily communicate with each other, and with persons in other well-structured fields (e.g., physicists worked with astronomers to test Einstein's theories). In well-structured fields young people quickly learn the rules and are rewarded for new ideas.*

Loosely structured fields lack observable phenomena. Examples include religions and psychology. Loosely structured fields have mythology, traditions, and rituals ("this is the way we've always done it") instead of laws. Authoritative experts interpret observed phenomena in terms of myths. E.g., the ancient Chinese believed that eclipses were the celestial dragon eating the Sun or the Moon, and people had to bang drums and pots to scare the dragon away.¹¹

In loosely structured fields, each "school of thought" has its own definitions of terms, and each school's data isn't recognizable or quantifiable by other schools. Each "school of thought" has its own

* The five youngest Nobel Laureates were all in physics, with ages ranging from 25 to 31. In contrast, the youngest Nobel Laureate in economics was 51, and no speech-language pathologist has won the Nobel Prize for medicine. <http://nobelprize.org/contact/faq/index.html#3b>

values and goals. E.g., in the exchange of letters between Ryan, Reitzes and Snyder you saw that stuttering modification therapy has been practiced for more than fifty years, yet speech-language pathologists can't agree what the goal of the therapy is: fluent speech; or non-avoidance of stuttering and "strategies to move forward through moments of stuttering," with increased stuttering?

Contributing to this problem is lack of agreement on outcome measures, varied definitions of success and the heterogeneity of our clients.¹²

Members of each "school of thought" don't read papers written by members of other "schools of thought." It's not simply ignoring differing points of view; cognitive biases make members of different "schools of thought" unable to understand each other.

Young people in a loosely structured field are expected to apprentice to an older mentor. Young people are rewarded for parroting old ideas. New ideas are encouraged only if they are old ideas repackaged. New ideas outside of the "school of thought" are ignored.

Observable and Unobservable Phenomena

The field of stuttering is a mixture of observable and unobservable phenomena. Some areas are well-structured and other areas are loosely structured.

The Iowa era was loosely structured. At the University of Iowa in the late 1920s Bryngelson and others tried to study the neurology of stuttering, but the methods available at the time (e.g., switching left-handed people to use their right hands) were too crude to make adequate observations.¹³ Johnson observed young children soon after the onset of stuttering but then ignored his observations when the data conflicted with his *diagnosogenic theory*¹⁴ (which wasn't a theory at all, but rather was a myth). Van Riper's stuttering modification therapy aimed to reduce adult

stutterers' unobservable speech-related fears and anxieties, and to modify stuttering in ways that were difficult to measure, e.g., reducing the severity of disfluencies while using voluntary stuttering to increase the number of disfluencies.

The fluency shaping era focused on observable phenomena: speech disfluencies. However, different researchers measure disfluencies in different ways, e.g., disfluencies per word vs. disfluencies per syllable. Some researchers use statistics to analyze their data, when others don't¹⁵ (statistics make unobservable effects observable, but only to people who understand statistics).

Iowa era practitioners described treatment efficacy as if there were sub-types of stutterers,¹⁶ e.g., Van Riper's "four tracks" of stutterers, and studies were reported as percentage of subjects helped (e.g., a treatment was effective for half the stutterers¹⁷). In contrast, fluency shaping practitioners see stuttering as one disorder, so studies provide results as averages of all subjects in study. Neither method is necessarily better than the other, but it makes comparisons between stuttering modification and fluency shaping programs difficult. For example, the National Stuttering Association position paper about anti-stuttering devices states:

there are no published, independent studies that show what percentage of the population of people who stutter are likely to benefit from the SpeechEasy.¹⁸

The statement is true, but several studies present results averaged across the subjects. Each school of thought's data isn't recognizable or quantifiable by others.

In the neurological era brain imaging enables us to observe previously unobservable phenomena, such as auditory processing activity. But brain scans are far from ideal. Most researchers don't have access to a brain scanner, and even if they did they wouldn't know how to interpret the pictures.

It's an alluring prospect, but the approach is still viewed with suspicion by mainstream psychiatrists...journals

churn out hundreds of brain imaging articles each month [but] we haven't quite figured out what these pictures mean. Are we really seeing the mind in action, or are we allowing ourselves to be seduced by images that may actually tell us very little?...In recent years, functional neuroimaging research has yielded a wealth of intriguing fodder for journalists but few scientific breakthroughs...

Yale researchers gave participants various nonsensical explanations of human behavior. Half the time, the researchers added the phrase "Brain scans indicate" before the explanation, and then inserted the spurious finding. When the brain-speak was added, participants judged the explanations more satisfying.¹⁹

Scientific Revolutions

Thomas Kuhn, in his 1962 book *The Structure of Scientific Revolutions*, coined the term "paradigm shift" to mean a change in basic assumptions in a field of knowledge. The change from the Iowa era to the fluency shaping era was a paradigm shift: the assumption that stutterers can never learn to talk fluently changed. Another paradigm shift occurred in the 1990s, changing the assumption that the neurological causes of stuttering can't be changed.

Kuhn also coined the terms *normal science* and *revolutionary science*. Normal science agrees on a paradigm or set of basic assumptions. Kuhn wrote that normal scientific work is akin to "puzzle-solving" in the sense that puzzles always have an answer. Scientists work on problems expecting to find single, clear answers.

Kuhn noted that every scientific field has *anomalies* that are difficult to explain within accepted paradigms. Some scientists are bold while others are conservative. The bold scientists propose a new paradigm, in a process Kuhn called *revolutionary science*, and the conservative scientists oppose the new paradigm.

Kuhn also noted that different scientific paradigms aren't comparable, or are *incommensurable*. Assumptions are different, terminology has different definitions, and what questions are valid are different. Scientists can't rationally compare one paradigm to

another, and choose the one that best explains the facts. The tools and evidence used to support each paradigm are developed within the paradigm, so supporters of a paradigm believe they have proof that their paradigm is correct. Kuhn wrote:

Though each may hope to convert the other to his way of seeing science and its problems, neither may hope to prove his case. The competition between paradigms is not the sort of battle that can be resolved by proof.²⁰

Kuhn's ideas are controversial, especially the idea that intelligent, educated, respected experts can't agree as to what ideas are right and what ideas are wrong.

As you explore the field of stuttering treatments, I hope that this book will help you ask the right questions and understand the answers, especially the "between the lines" context and code phrases used by experts in this field. Like all human activities, fields of science are rooted in their social and cultural contexts. If you can sort the apples from the oranges of stuttering treatment you'll be better able to make informed choices as to the best treatment for yourself or your child.²¹



Early Childhood Stuttering

About 80% of stutterers are children. Almost all stutterers started stuttering as young children.

However, until recently little was known about childhood stuttering. A 1986 survey found that 80% of research studies focused on adult stuttering, and only 20% about childhood stuttering.⁴³ Recent research has exploded many long-believed myths about early childhood stuttering, and helps us better understand school-age and adult stuttering.

Prevalence, Definition and Differential Diagnosis

Approximately 5% of preschool children stutter.⁴⁴ The average age of stuttering onset is 34 months (two years, ten months old).⁴⁵ Approximately 90% of stuttering cases start before the age of four.⁴⁶

At the ages of two and three, children are rapidly developing speech and language skills. All children make speech and language mistakes or *normal disfluencies* at this age. However, early childhood stuttering is different from normal disfluencies.⁴⁷

Normal disfluencies are mostly interjections interjections of “um,” “uh,” and similar fillers; and, to a lesser extent, revisions and word repetitions.⁴⁸

Early stuttering is primarily sound, syllable, and word repetitions; and, to a lesser extent, prolonged sounds and blocks; and also revisions and interjections.⁴⁹

The Stuttering Foundation of America has a brochure and a video to help parents and clinicians to make a differential diagnosis between early childhood stuttering and normal disfluencies.⁵⁰ However, according to Ehud Yairi and Nicoline Grinager Ambrose,

parents usually are reliable in diagnosing stuttering in their child....the identification of early stuttering in clinical settings is seldom difficult. We wonder why several authors...have expressed a different opinion, emphasizing the great overlap and possible confusion between early stuttering and normal disfluency, and cautioning clinicians of the difficult task.⁵¹

Onset

Stuttering typically begins suddenly. Unlike other communication disorders, stuttering begins after the development of normal speech. Other communication disorders occur because normal speech fails to develop, for various reasons.⁵² But stuttering children first developed normal speech, or, typically, better than normal speech and language skills. Then one day, one week, or over a few weeks, the child starts to stutter.

Approximately 30% of stuttering children started stuttering in one day, 40% started in three days or less, almost 50% in on week or less, and almost 75% in two weeks or less.⁵³

85% of parents reported that at the onset of stuttering, their child repeated syllables and words three to five times per instance of stuttering. In addition, 36% reported sound prolongations, and 23% reported conspicuous silent intervals during speech, 14% reported blocks, 18% reported facial contortions, and 18% reported respiratory irregularities. 36% reported moderate to severe tension or force during speech. In contrast, only 32% of parents reported that their child started stuttering with only easy, effortless repetitions.⁵⁴

Within one year of onset, most parents (53%) reported secondary physical symptoms, including tension or strain in the face, eyes, lips, tongue, jaw, and neck; respiratory irregularities, and tense movements (jerks) of the head or limbs.⁵⁵

The onset of stuttering was associated with illnesses or excessive fatigue (14%), emotionally upsetting events (40%), and “development stress,” e.g., toilet training (36%), for a combined total of more than 50% of parents associating one or more of these stressful

experiences with the onset of their child's stuttering.⁵⁶

At the onset of stuttering, boys outnumber girls by about 2:1.⁵⁷

A study of 3,404 preschoolers in Illinois found no differences in prevalence between African-American, European-American, and other racial groups.⁵⁸

Recovery

In the Illinois Longitudinal Study of 89 stuttering children, most children recovered from stuttering, without treatment or therapy, within three years of the onset of stuttering (around age six).

The greatest period of recover was 31 to 36 months after onset (five to six years old). Four years (48 months) after onset, approximately 75% of children recovered; and five years (60 months) after onset 80% had recovered. None of the 19 children (20%) who stuttered more than five years (i.e., were still stuttering after around age eight) recovered, even though 17 of these 19 children received speech therapy.⁵⁹

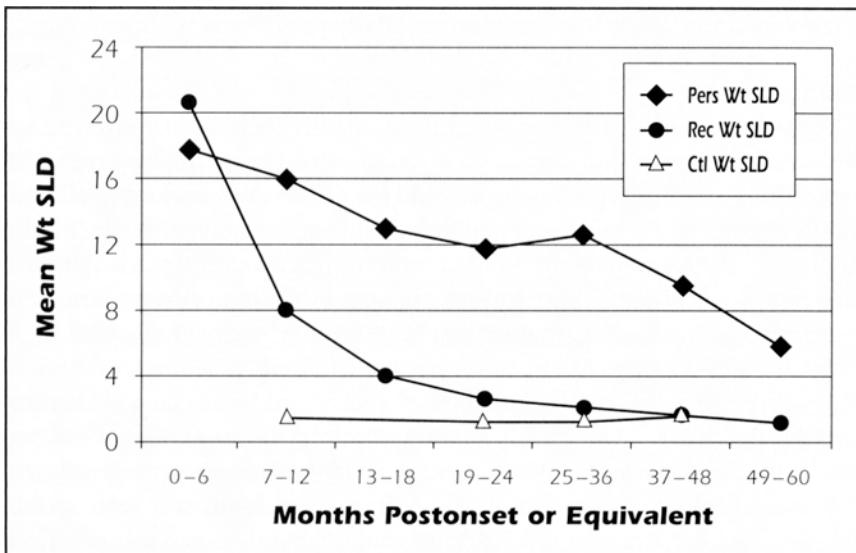


Figure 5.3. Mean weighted (Wt) SLD for persistent (Pers), recovered (Rec), and control (Ctl) groups over time.

The Illinois study found that the 89 children could be divided into two groups. Some children recovered rapidly (the black circles in Figure 5.3), while other children recovered slowly (the black diamonds in Figure 5.3; the white triangles are children who didn't stutter).

The rapid recovery group recovered half their fluency within one year, and almost their fluency within two years.

The "persistent" group gradually improved fluency over five years.⁶⁰ Some of these children recovered fluency, some continued to stutter after five years.

No differences were found between the two groups, i.e., initially severe stutterers were not more likely than initially mild stutterers to recover quickly or slowly.⁶¹ Girls were more likely to recover than boys, and more likely to recover quickly, but the sample size of girls was too small to be statistically significant.⁶²

Phonological Development

Phonological development is the ability to both perceive and produce speech sounds (phonemes), many of which are subtly different. It encompasses articulation disorders, which are an inability to produce specific speech sounds. Either way the result is a child producing unintelligible speech.⁶³

The Illinois study found that soon after onset, children who stutter are behind their peers in phonological development. Within two years, the stuttering children catch up to their peers in phonological development. The children who rapidly recovered from stuttering also rapidly caught up with their peers in phonological development. The children who persisted in stuttering were slower to catch up in their phonological development.⁶⁴

Language Development

The language abilities of young children who stutter has been the subject of many studies. The "longstanding view" in the field has been that young children who stutter have language learning

difficulties or language impairment, although the deficiencies are small and within normal ranges.⁶⁵ Different studies used different tests, and examined different age groups.

A series of studies used a variety of language tests with children within three months of the onset of stuttering, with a control group matched for age, gender (girls develop language skills faster than boys), and socio-economic status. No statistically significant differences were found that. The stuttering children “performed more poorly” than the control group, but “most stuttering children scored well above average for age.”⁶⁶ This seems impossible, unless the controls were all baby Einsteins, or the tests were standardized poorly.

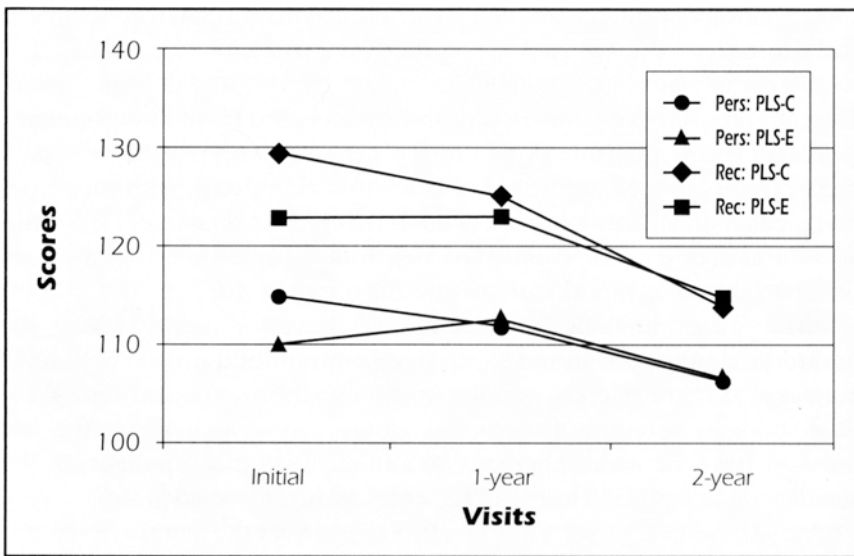


Figure 7.1. *Preschool Language Scale* scores for persistent (Pers) and recovered (Rec) groups at initial, 1-year, and 2-year visits. PLS-C = *Preschool Language Scale Auditory Comprehension*; PLS-E = *Preschool Language Scale Expressive Communication*.

The Illinois study took a different approach, by analyzing children’s spontaneous speech (as opposed to their responses to tests). In this study, the stuttering children were above average in language development, for both comprehension (listening) and

expression (speaking).⁶⁷

The children who went on to rapid recoveries (the black diamonds and squares in Figure 7.1) scored especially high. The children whose stuttering persisted (the black circles and triangles in Figure 7.1) had lower language scores, but still better than normal. Over two years the stuttering children lost most their high scores compared to their peers, i.e., their peers caught up to them in language development.

Language is complex, integrating many areas of the brain, and generalizations about language abilities may be inappropriate. For example, I enjoy slowly composing and rewriting e-mails (and books), but I dislike fast-paced online chatting or text messaging. I can read and write Spanish, but I can't understand spoken Spanish. I was good at a job writing computer manuals, but I can't write poetry. My puns are infamous among my friends. Rap artists make millions of dollars solely on their language skills, but rap songs all sound the same to me.

Making the issue more complex, the ages between two and four are when children rapidly expand their abilities to hear and speak language.⁶⁸ I have no doubt that some children develop some language skills faster than other language skills, and this has some relationship to stuttering, but the exact relationship is unclear.

Motor, Psychosocial, and Cognitive Abilities

The fluent speech of preschool children who stutter differs from that of peers who don't stutter. The stutterers appear to have poorer than normal vocal fold function, reflecting difficulty integrating respiratory, laryngeal, and cortical control,⁶⁹ and speak slower.⁷⁰ Children who later persisted in stuttering had restricted articulatory movements, as measured by F2 formant transitions, although children who later rapidly recovered were as good as or better than their non-stuttering peers in this measure.⁷¹

Psychologically, no differences were found between children who stuttered, or their parents, when tested close to the onset of stuttering, and non-stuttering children and their parents, for

behavior problems, energy levels, and maturity levels;⁷² stress levels for the parents;⁷³ anxiety levels for the children;⁷⁴ and non-verbal cognitive skills (e.g., matching blocks with various colors).⁷⁵ No link was found between awareness of stuttering and anxiety.⁷⁶

Genetics

When a preschool stuttering child has several family members who stuttered into adulthood, there is a greater chance that the child's stuttering will persist. If the child has family members who stuttered as children and then recovered, there is a greater chance that the child will follow this pattern.⁷⁷

A study of persons with Tourette's syndrome and their families linked three genes controlling dopamine levels to five disorders: Tourette's, stuttering obsessive-compulsive disorder (OCD), tics, and attention deficit hyperactive disorder (ADHD).⁷⁸ In other words, high dopamine levels correlated with these five disorders.

Another study genetically associated stuttering to Specific Language Impairment, autism, and Tourette's.⁷⁹

Autoimmune Dysfunction

Tourette's syndrome is similar to stuttering in many ways. Persons with Tourette's syndrome have repetitive, semi-voluntary movements (tics) such as eye blinking, throat clearing, coughing, neck stretching, and shoulder shrugging. The tics are semi-voluntary in that tics can be consciously controlled, but this typically exacerbates the tics. Touretters often control the disorder by substituting more-acceptable tics. Different types of stress can set off or prevent bouts of tics. Tourette's has been described as "stuttering with one's hands and feet."

In a subgroup of individuals with Tourette's, a childhood autoimmune "trigger" led to Tourette's. A childhood streptococcal infection caused the child's immune system to attack brain cells in the putamen area. When the child recovered from the fever, he or she had Tourette's. The putamen controls gross (large) muscle movements. Abnormally high dopamine levels in the putamen area

of the brain are associated with Tourette's.⁸⁰

It's possible that in the 14% of children whose stuttering onset was associated with illness or extreme fatigue,⁸¹ the child's immune system attacked brain cells in the left caudate nucleus speech motor control area, making this brain area abnormally sensitive to dopamine.

Brain Scan Research

No brain scan research has been done on young children who stutter.

This problem is not merely one of human subjects' approval, which places a much higher burden on justifying the use of [brain imaging] with children. The fact is that the typical toddler could not perform the tasks required to make the imaging results interpretable.⁸²

Brain scan research of adults who stutter have underactivity in the auditory processing areas, and overactivity in the speech motor control areas. Additionally, adult stuttering has been linked to abnormally high levels of the neurotransmitter dopamine. High dopamine levels might relate to speech motor overactivity. (See "Factors Contributing to Stuttering," page 21.)

Auditory processing underactivity is linked to phonological disorders. It may be reasonable to speculate that children start stuttering partly because their auditory processing lags behind other areas of brain development.

Overactive speech motor control and/or high dopamine levels could be related to poor vocal fold control and difficulty integrating speech motor activity.

Indirect Therapy

The Iowa treatment for early childhood stuttering is *indirect therapy*. The aim is reduce a child's fears and anxieties about stuttering by altering the parents' behavior.

The fluency shaping era treatment for early childhood stuttering is *direct therapy*. The aim is to train the child to speak fluently.

The neurological era of stuttering treatment hasn't developed an early childhood stuttering treatment. Anti-stuttering devices and anti-stuttering medications aren't used with preschool children. Maybe phonological therapy will help young stutterers, but no one has tried this.

The Diagnosogenic Theory

As noted above (page 26), all children have normal disfluencies. Examples include repeating words or phrases, hesitations, or using filler words such as "uh" and "um."⁸³ The *diagnosogenic theory*, developed by Wendell Johnson between 1934 and 1939 and published in 1942, proposed that stuttering begins with unusually anxious or perfectionistic parents. These parents react negatively to normal childhood disfluencies. The child then may develop anticipatory avoidance reactions, i.e., try to anticipate normal disfluencies and physically struggle to avoid them.⁸⁴ These struggles and avoidances, together with learned fears and anxieties develop in stages into stuttering. Johnson wrote that stuttering begins "not in the child's mouth but in the parent's ear."⁸⁵

Johnson and his researchers were unable to prove that parents of stuttering children were substantially different from parents of non-stuttering children.⁸⁶ Then they compared the speech of stuttering children, at the onset of stuttering in one study⁸⁷ and after a period of one month to three years in a second study,⁸⁸ to the normal disfluencies of non-stuttering children, finding stuttering to be very different from normal disfluencies.

But Johnson didn't let the facts get in the way of his theory. He believed that speech therapy made stuttering worse, and advocated not treating young children's stuttering. Instead, Johnson and others developed indirect therapy. Practitioners of indirect therapy modify the parents' behavior, without altering the child's speech.

Johnson's Popularity Today

Today Johnson's indirect therapy is widely practiced. For example, the Stuttering Foundation of America advises parents to

Try to model slow and relaxed speech when talking with your child, and encourage other family members to do the same....When your child talks to you or asks you a question, try to pause a second or so before you answer....Reduce the number of questions you ask your child....⁸⁹

The National Institute of Deafness and Other Communication Disorders advises parents to "speak slowly and in a relaxed manner. If a parent speaks this way, the child will often speak in the same slow, relaxed manner."⁹⁰

KidsHealth.org advises parents to "Provide a calm atmosphere in the home. Try to slow down the pace of family life. Speak slowly and clearly when talking to your child or others in his or her presence."⁹¹

Efficacy of Indirect Therapy

A literature review found

...little convincing evidence...that parents of children who stutter differ from parents of children who do not stutter in the way they talk with their children. Similarly, there is little objective support...that parents' speech behaviors contribute to children's stuttering or that modifying parents' speech behaviors facilitates children's fluency.⁹²

More than a dozen studies found no evidence that altering parental behavior changed children's speech. These studies found no differences for:

- The language of mothers of preschool children who stutter vs. controls; and no difference between the parents of children who recovered from stuttering vs. parents of children

whose stuttering persisted.⁹³

- Positive statements (praise, encouragement, agreement).
- Negative statements (criticism, reprimands).
- Questions.
- Topic initiations and terminations.⁹⁴
- Conversational assertiveness and responsiveness.⁹⁵
- “Response time latency,” or the time between one person finishing speaking and the other person beginning speaking.⁹⁶
- “Formal” style vs. a “casual” style.⁹⁷
- Illocution (the communicative effect of an utterance).⁹⁸

Some studies found that indirect therapy produced results opposite to the researchers’ expectations:

- A study found that mothers interrupt their child after disfluencies, not before.⁹⁹ This suggests that *not* interrupting causes children to stutter!
- A study found that when mothers spoke faster their children spoke *slower*.¹⁰⁰ Another study trained parents to slow their speaking rates. The children’s speaking rate *increased*.¹⁰¹ This suggests that parents talking *slowly* causes their children to stutter!
- Parents of children who stutter produced more positive statements (e.g., praise, encouragement) and fewer negative statements (criticisms, disparaging remarks) than parents of children who didn’t stutter.¹⁰² This suggests that parents’ praise and encouragement *causes* children to stutter!
- A multiyear study followed 93 preschool children. At the start, none of the children stuttered. One year later, 26 of the children stuttered. The researchers compared the speech behaviors of the two groups of mothers, before their children started stuttering. No differences were found, except that mothers of children who would stutter had shorter, less complex sentences.¹⁰³ That suggests that short, simple language causes children to stutter.

More generally, some psychologists now discount the role of parents in the development of children's character and personality. About 50% of the personality differences are attributable to our genes, and the rest due to the child's peers: "...what parents do seems to be nearly irrelevant."¹⁰⁴

Could Indirect Therapy Harm Children?

Practitioners of indirect therapy advise parents to use simpler language with their stuttering children. But

...the complexity of input language is a very potent predictor of children's later language profiles—greater sophistication in parental input language is positively associated with children's language proficiency.¹⁰⁵

In other words, exposure to language in early childhood relates to the child's later language abilities and IQ scores. "Dumbing down" how you talk to your child might achieve nothing but dumbing down your child.

Direct Therapy

In contrast, *direct therapy* changes the child's speech and behaviors. Typically these speech-language pathologists advocate treating all stuttering children, as soon as possible after the onset of stuttering. They believe that early treatment is more effective with less time and cost than later therapy.¹⁰⁶

However, little or no research supports these beliefs. One program claimed 100% effectiveness for all the children who completed the program—but only about half the children who started the program completed it.¹⁰⁷ Other programs make effectiveness claims without presenting data.¹⁰⁸ Still other programs have good research but failed to use a control group.

Different studies use different methods to measure stuttering. Different studies have different time frames (e.g., measuring fluency one year post-therapy vs. three years post-therapy). Recov-

ery rates might be higher or lower depending on how stuttering is measured, or what the time frame is. A measurement method might find that 90% of children in a therapy program are fluent three years later—and find that 90% of children who received no therapy were also fluent three years later.

The Lidcombe Program

The most popular direct therapy, and the only direct therapy that has been proven effective, is the *Lidcombe Program*. The therapy appears to be more effective than other therapies because it is simple enough for parents to do at home, yet is a direct therapy.

Developed in Australia, the therapy begins with a clinician verbally rewarding the child's fluent speech, e.g., saying "good talking."

Originally the therapy also included negative reinforcement for disfluent speech, e.g., "that was bumpy speech." Clinicians were told to make one negative reinforcement for each five positive reinforcements. The negative reinforcement has been dropped from the current program.

Children are sometimes asked for self-evaluation, e.g., "Was that smooth speech?" The clinician also actively corrects the child's disfluencies by repeating the child's words fluently, and the child is asked to repeat the words fluently, sometimes several times.

Next, a parent is trained to practice this therapy with his or her child at home. Home therapy begins with brief structured sessions and progresses to everyday conversations.

The therapy also encourages children to spontaneously self-evaluate and self-correct, e.g., to recognize when they are disfluent, state this ("that word was bumpy"), and then repeat the word fluently. Eleven clinical visits is typical.¹⁰⁹

The Lidcombe Program is one of the few stuttering therapy programs that emphasizes documentation of the child's level of fluency.¹¹⁰ Several studies have shown the Lidcombe Program to be effective, including a study with a control group.¹¹¹ In one study, 43 preschool children were found to have near-zero stuttering two to

seven years post-treatment.¹¹² The Lidcombe Program is ineffective for school-age children.

Other Direct Therapies

Other direct therapies include:

- An adaptation of adult *fluency shaping therapy* (page 80) to children, including slow speech with stretched vowels; reducing vocal volume, especially on the first syllable; and blending words (continuous phonation); while progressing from single-syllable words to longer conversations.¹¹³ A study found that a fluency shaping program was effective for 30 out of 33 preschoolers, or 91%. This study is questionable because data was presented for only one child, and the study lacked a control group.¹¹⁴
- Gradual Increase of Length and Complexity of Utterances (GILCU) therapy uses verbal positive reinforcement (e.g., “good”) for fluent speech, beginning with single-syllable words and progressing to 5-minute conversations.¹¹⁵ A study of five children who received 20 hours of ELU treatment (similar to GILCU) found that stuttering decreased more than 60%.¹¹⁶
- The *Stocker Probe* rewards the child for fluent speech while increasing linguistic demands, from forced-choice answers (e.g., “Is it round or square?”), to single word responses (e.g., “What is it?”), to open-ended questions (e.g., “What can you use it for?”), to detailed description (e.g., “Tell me about it.”), to formulation of novel content (“Make up your own story about it.”).¹¹⁷
- *Speech Motor Training* trains the child to produce all of the sounds of speech by saying sequences of nonsense syllables with as fast a speaking rate as the child can achieve while maintaining accuracy.¹¹⁸ A study of six children found that after 24 sessions stuttering was reduced on average about 49%.¹¹⁹
- *Psychotherapeutic play therapy* to analyze stress in a child’s

life and his reactions to stress, improve maternal bonding, play and interact with different personalities, etc.¹²⁰ A study of a play therapy program in Japan claimed 90% success, but no control group was included.

I'm unaware of any studies or cases of preschool stutterers who received therapy to improve their auditory processing,* or other treatments that included use of computers or other electronic devices.

Direct Therapy Games

Speech-language pathologists use games to encourage speaking, to train specific speech skills, or to reinforce fluent speech.

The game "Solo Play" encourages speaking. The speech-language pathologist has two boxes of toys, one for the child, and the other for herself. At first, they silently play with their toys. Gradually, the speech-language pathologist starts making car or animal noises as she plays. Then she adds single words. Then her toys start bumping into the child's toys, and they interact for short periods. Eventually she uses short phrases and sentences. This places no speaking demands on the child. The goal is to let the child verbalize little by little, as he or she feels like talking.

In the game "Turtle Talk," the speech-language pathologist makes a turtle hand puppet walk slowly when the child uses slow, relaxed speech. When the child uses fast, tense speech, the turtle stops and crawls into his shell. The child has to use slow, relaxed speech to ask the turtle to come out of his shell. If you don't have a turtle hand puppet, you can have a car slowly drive along a table, avoiding obstacles.

In the game "Say The Magic Word," the clinician or parent says that he or she is thinking of a word, and if the child guesses the word, he will be rewarded with a peanut or will be allowed to ring a

* About ten years ago a company developing auditory processing therapy software tried it on adult stutterers. No results were reported, suggesting that the treatment was ineffective.

bell. They then look through a picture book or look out a window. This game is easy for a parent to play while driving with the child. When the child says a word fluently, the parent says that that was the magic word, and rewards the child. If the child stutters, he isn't rewarded. The parent doesn't think of any word, but rather listens for the child to say fluent words.

In the game "Can't Catch Me," one person gets a peanut when the other person asks a question. You then quietly eat your peanut before answering the question. If you answer the question before eating your peanut, you must put your peanut back. The parent should lose more peanuts than the child, by answering too quickly. This reduces the time pressure the child feels about quickly answering questions.

Modeling

Caitlyn, a four-year-old female who began to stutter in the midst of her parents' divorce, was exhibiting significant struggle and tension behavior as well as secondary behaviors. Of most concern was her head-banging behavior during difficult moments of stuttering. After many sessions in which I attempted to eliminate this behavior through fluency-shaping principles, I saw no change. One day, shortly after Caitlyn banged her forehead on the table to interrupt a block, I modeled the same behavior. Caitlyn was shocked and ignored me. After I did this several times she asked me, "Why did you do that? Didn't that hurt?" I responded, "I don't know why I did it. But it sure didn't help me get my word out!" Caitlyn never again banged her head to help her talk. She has been out of therapy for six years and remains fluent.¹²¹

This speech-language pathologist's *modeling* of Caitlyn's behavior was radically different from conventional stuttering therapy practices. Most clinicians would have pretended not to notice Caitlyn's head-banging behavior. They believe that modeling is the same as mocking, teasing, or bullying and will cause emotional trauma.

But let's try a *Gedankenexperiment* (thought experiment). Imagine that a teenage brother and sister use profanity at the family dinner table. Should the parents act horrified and tell their children never to use such language?

You know that won't work. The teenagers will use profanity at the next opportunity, just for the amusement of horrifying their parents. Instead, picture the parents immediately using twice the profanity of the teenagers. Dad could say, "#\$%^, this is best *&^% meatloaf in the whole @#\$% world!" Mom could respond, "Oh, you big !@#\$, you're so #\$\$^ sexy and when you talk ^%\$#!"

I guaranty that the teenagers will turn red with embarrassment, and never use profanity again in front of their parents.

In a psychology class about traumatized children we saw a video of a ten-year-old boy destroying a psychologist's office. The boy threw every object he could throw, and smashed everything else. The psychologist sat there calmly telling the boy not to destroy the office. He finally grabbed the boy and hugged him. To me it looked like a full body restraint but the instructor said it was a hug, and that was what the boy really needed.

I asked what would have happened if the psychologist had modeled the boy's behavior. For example, the psychologist could have thrown and smashed stuff. The instructor said that was the worst idea she'd ever heard. But I think the boy would have stopped, watched in amazement as the psychologist destroyed his own office, and then asked, "Why did you do that?" The boy and the psychologist could then have started talking about their feelings, which is what I think the boy needed.

The purpose of modeling is to improve the subject's awareness of his or her behaviors. Stutterers are largely unaware of their stuttering, or at least what they do when they stutter. Everyone else can see the stuttering but the stutterer can't. Combining video and modeling can help a stutterer improve self-awareness.

Modeling also dispels a person's mistaken view that a behavior is invisible, or it's acceptable, or everyone does it. If everyone ignores undesirable behavior then the person may think it's OK.

Modeling only works when the clinician and/or the client know how to replace the undesirable behavior with a target (good) behavior. For example, it's OK for your speech-language pathologist to model your stuttering because she can then show you how to speak fluently. It was OK for my Romantic Disaster of 1996 (page 117) to make me aware that I was stuttering, because I knew what to do to talk fluently. It's not OK to point out a problem to someone if they have no idea what to do about it.



School-Age and Teenage Stuttering

Among preschoolers, boys who stutter outnumber girls who stutter about two to one.¹²²

But more girls recover fluent speech, and more boys don't.¹²³ By fifth grade the ratio is about four boys who stutter to one girl who stutters. This ratio remains into adulthood.¹²⁴

Why boys are more likely to stutter, and less likely to recover, isn't certain. Boys generally have more diseases and disorders, because the Y chromosome has fewer genes than the X chromosome so the two chromosomes pair incompletely. Boys generally have more speech disorders because girls are usually better at speech and language, and especially at using speech and language for social purposes. Speech and language tend to be more stressful for boys, so boys usually prefer to interact physically.

In my unscientific observations, girls appear to develop the ability to socialize with other children in groups by age five, but boys develop this ability later. This was apparent at my nephew's sixth birthday party. One of his presents was a slinky. I showed his friends how to make the slinky walk down the stairs. Three girls, all six years old, sat together at the top of the stairs and took turns. One girl could easily make the slinky walk down the stairs. This was harder for the second girl, but she could do it. The third girl couldn't do it at all. But they cooperated and encouraged each other.

Two boys, also six, wanted to try it. But they couldn't get to top of the stairs without wrestling each other and falling back down the stairs. I wouldn't allow wrestling on the stairs, so they'd run around the living room chasing each other. Then they'd come back wanting to play with the slinky, but start wrestling on the stairs again.

At five, girls are ready to start school. Boys are wild animals until seven. School can be stressful for boys who aren't ready for it.

The most stressful part of school for boys may be the communication demands. Girls are using communication to make friends, developing their social skills along with their communication skills.

Ask your child whether he or she likes school. When I was in elementary school, the girls liked school and the boys didn't. At this age, girls see school as where they socialize with their friends, via quiet verbal communication and cooperation. Boys see school as a place where they're told *not* to play with their friends, via physical interaction such as roughhousing.

Boys may not be ready to socialize with 25 other children, in a building with hundreds of other children. My dog loves one-on-one play with other dogs. But groups of dogs overwhelm him, and he stops playing. What looks like a friendly, fun atmosphere to adults can be stressful to a dog or a child.

Even worse, some children are in school and day care for twelve hours, without quiet time to relax or to be alone. That would stress me out!

If your five- or six-year-old son stutters, and you don't think he's ready for school (e.g., he vomits or wets his pants at school), consider keeping him home another year, or look into a co-op school where a parent can attend school with him, or let him attend school but don't put him in daycare for another six hours each day.

Language Abilities

The question of whether school-age stutterers have poor language skills is less controversial than the same question with preschool stutterers. Most studies have found that school-age children have language skills similar to their non-stuttering peers.¹²⁵

Motivation for Speech Therapy

The father of a ten-year-old stutterer wanted to do everything to help his son. On the advice of his son's speech-language pathologist, the father bought my company's top-of-the-line electronic ant-stuttering device. The speech-language pathologist trained the

father to use the device. The father worked with his son thirty minutes every evening.

After two months, the father returned the device for a refund. The son was 100% fluent when practicing with the device. The boy had no interest in using slow, relaxed speech the rest of the day. Stuttering didn't stop the boy from playing baseball or doing other things boys do. In the world of seven- to twelve-year-old boys, talking isn't an important activity.

But your seven- to twelve-year-old son's positive self-esteem can be a double-edged sword. It's hard to get school-age boys motivated to do speech therapy. This makes it more important that parents do speech therapy with their child in every conversation. Ask your child's speech-language pathologist what your child should be doing (e.g., slow speech with stretched vowels). Have your child use therapy skills on every sentence he says to you. Be your child's therapy helper.

SLPs vs. Parents vs. Computers

A study of 98 children, 9 to 14 years old, compared three types of stuttering therapy.¹²⁶ The three types of therapy were:

- Intensive "smooth speech" fluency shaping trained relaxed, diaphragmatic breathing; a slow speaking rate with prolonged vowels; gentle onsets and offsets (loudness contour); soft articulation contacts; and pauses between phrases. The children did this therapy in a speech clinic for 35 hours over one week.
- Home-based "smooth speech." This was similar to the first group, but parents were included, and encouraged to continue therapy at home. Therapy was done in a speech clinic for six hours once a week for four weeks (24 hours total).
- Electromyographic biofeedback. The children used an EMG biofeedback computer system about six hours a day for one week (30 hours total). The EMG system monitored the child's speech-production muscle activity. The children

were instructed to tense and then relax their speech-production muscles. The goal was to develop awareness and control of these muscles. The children then worked through a hierarchy from simple words to conversations, while keeping their speech-production muscles relaxed. After mastering this while watching the computer display, the children did the exercises with the computer monitoring but not displaying their muscle activity. The speech-language pathologists did relatively little with the children: "Constant clinician presence was not necessary as the computer provided feedback as to whether the child was performing the skills correctly."

- A fourth (control) group didn't receive any stuttering therapy.

At the end of each therapy program, all three therapies reduced stuttering below 1% on average. The control group had no improvement in fluency.

One year after the therapy program, the percentage of children with disfluency rates under 2% were:

- 48% of the children from the clinician-based program.
- 63% of the children from the parent-based program.
- 71% of the children from the computer-based program.

The results for children with disfluency rates under 1% were even more striking:

- 10% of the children from the clinician-based program.
- 37% of the children from the "parent-based" program.
- 44% of the children from the computer-based program.

In other words, the computers were most effective, the parents next most effective, and the speech-language pathologists were least effective in the long term. At the 1% disfluency level, the computers and the parents were about four times more effective than the speech-language pathologists.

Four years later, all three groups had average stuttering reductions between 76% and 79%. This may have been due to the more disfluent children receiving additional speech therapy.¹²⁷

Advice for Parents, by Magdalene Lima, SLP

A survey of school speech-language pathologists found that less than 25% of the children treated were considered to be recovered. The children were treated for an average of three years.¹²⁸ These aren't stellar results.

A school speech-language pathologist about her experiences:

I am a speech-language pathologist in private practice and formerly a public school therapist for nine years. My suggestions to parents of children with speech problems are:

Do some research in these areas. Check out the communication disorders websites.

Go to your school speech-language pathologist with what you know and ask her what she thinks. The best approach is to treat her as the professional she is in a non-critical way with the attitude that you just want to understand all the treatments available for your son. Offer to help get information to her if she doesn't have it. Let her know you understand the position she is in and that you are on her team. This will get you much further in getting the appropriate services for your child than fighting your school.

If your insurance covers it or you have the funds, find a good private pediatric speech and language clinic in your area and AT LEAST have an evaluation done. Just that information alone could really help the school SLP. If you can afford private therapy, get it. The main difference in service is that your child will receive individual therapy with a clinician that has the time and resources needed to provide the highest quality therapy.

As a former school speech-language pathologist, my skills and knowledge didn't suddenly change when I switched over to private practice. The setting changed, and that makes a huge difference. I now serve 30 clients rather than 75, I see them all individually, and I am paid more than in the schools. In the hours I don't see clients, I am busy researching, giving parent support, writing regular and detailed reports, and planning innovative therapy rather than going to bus duty, lunch duty, hall duty, faculty meetings that don't really

apply to me and filling out massive amounts of government-required paperwork.

Is The Problem Ability or Setting?

Now to those of you who think the worst of the public school speech-language pathologist: I'd like you to stand in her shoes for a minute. In the last three years of my public school experience my caseload became unmanageable. I had 75 students, including a severely and profoundly handicapped class, four autistic students and all other students in speech from grades K-5 at that school. I begged, cried and pleaded for help from my supervisors. I KNEW I could not provide the quality of service each and every one of these students and their families deserved. However, the answer was always: get creative, we don't have money in the budget. Please understand, in my situation, it was not a lack of caring, lack of skill or ability—there was absolutely nothing I could do. I became angry and frustrated at our administration. Why didn't they provide the training, time, personnel and support we needed to provide services to these students?

Speech Pathology: A Growing and Diverse Field

The disorders in our field and the therapies that have now been developed have become extremely specialized. In the schools I was expected by parents to be an expert in the following fields: stuttering, swallowing disorders, voice disorders, articulation disorders including tongue thrust, cleft palate, phonological process disorders as well as motor speech disorders, autism and PDD, traumatic brain injury, ADHD, language and learning disabilities, hearing impairments and social and pragmatic communication disorders. Excuse me, do you realize that just as physicians receive a basic foundation in medicine, so do speech-language pathologists receive a basic foundation in all of the above disorders. You graduate from college and through your experience and personal growth and research, you become an expert in a few areas. It would be virtually impossible for one person to have the time and energy it would take to become an expert in all those areas!

This is why our field is moving towards specialty certifications. What will public schools do then? I guess they will have to hire the specialists that their individual students require.

Many and Varied Problems in the Schools

More and more our district began hiring speech assistants (speech practitioners who are not required to meet the standards of education, clinical practicum and experience needed to be fully certified and licensed) to handle huge caseloads with minimal supervision from licensed speech-language pathologists. There is a shortage of qualified speech language pathologists willing to go into public school therapy when there are much more lucrative and attractive positions available in other settings. As I talked with administrators, I soon became aware of the pressure being applied to them from the state, parents and other agencies to meet all these educational requirements. For every parent who complains there is not enough money to provide quality special education services in the school, there is another parent complaining that their gifted and talented child is not being given the education THEY deserve because of all the money being poured into special education programs. Or what about the parents of children in sports programs, they have THEIR list of complaints. Everyone thinks that their cause is totally justified because they are arguing for their children, and nothing can convince anyone that their child doesn't deserve the best.

I left the public school system to go into private practice and now my problem is solved—I love my work and I'm giving quality services to clients with fantastic results! However, what's your solution? My final and personal resolution to this whole issue, is that in many cases—not all, but many—I truly feel that schools are doing the very best they can with the resources available to them to provide the services that our children need. However, sometimes, parents are right, it's not enough. So what are we going to do? Is every parent in America with a complaint going to file suit against the local school district? If this happens, our schools will begin focusing on preventing lawsuits rather than on how best to serve and educate our children.

Work With Your Administration/Educators

Sometimes all it takes is going to an administrator, such as the Director of Special Education, and pleading your case. Also give your specific suggestions at your child's IEP meeting. You'd better have some research and documentation to back up the necessity of your suggestions. The attitude and manner in which you present yourself is of utmost importance, if they perceive you are willing to make compromises and work with them they will be more willing to stick their neck out for you. Suggest specific things such as the district paying for an outside assessment, or hiring a consultant temporarily who can lend their expertise to your child's case. Get over any intimidation you feel in asserting yourself with these people, they are just people with children and jobs and stresses just like you. What they say to you is never written in stone.

Conclusion

I'm not saying you shouldn't fight extreme injustice or abuse. I'm saying it's a huge system with a lot of variables involved. The fight is societal and governmental—usually not your local educational facility. Become involved politically in your state with your speech and hearing association—they always have a branch that is lobbying for legislation to improve speech services in the schools. Meanwhile, you have a child that has needs for quality services in the area of speech pathology, do the best you can to get that service, whether it be private therapy through insurance or private pay, or school therapy, don't stop looking until you find what you need.

YOU take responsibility to research, learn things for yourself and communicate with those who affect your child's education.

Fostering Teenagers' Passion for Fluency

I am a mother of a stuttering thirteen-year-old boy. Stuttering really had never bothered him until this year. It is very frustrating for him to talk on the phone. His friends call all the time but he has refrained from talking on the

phone because his stuttering seems to get worse. My husband and I have noticed him withdrawing from his peers. We have always had an active role with his stuttering. He has been to a lot of speech-language pathologists and we have also tried the CAFET [bio-feedback computer] system. This was helping him. Unfortunately the closest center was more than two hours away. After one year it was too stressful on him missing too much school. Because of this we had to stop. Since then he has wanted nothing to do with speech-language pathologists.

I hear similar stories about other teenagers, with these elements:

- The teenager has been seeing his school's speech-language pathologists for five or even ten years. His speech isn't improving. He wants to discontinue speech therapy.
- He's fluent in the speech-language pathologist's office, but stutters everywhere else.
- The parents have taken him to other speech clinics, without success.
- He used to have good speech attitudes, saying whatever he wanted. Now he fears and avoids certain words or speaking situations.
- His social behavior has changed. He's withdrawing from social contacts.

Previously he saw himself as being like most other kids, doing the same things as other kids. School-age boys' social activities, e.g., baseball, don't demand much talking. Now he thinks of himself as a stutterer, different from other teenagers. Teenagers' social activities, e.g., dating or getting an after-school job, are harder for a stutterer.

Your teenager is an adult, in terms of stuttering. He should be doing adult stuttering therapy. This can include:

- Psychological stuttering therapy, training fluent speech (physical) skills.
- A support group for teenagers who stutter.

- An intensive speech therapy program or a summer camp for teenagers who stutter. (Google “speech camp for teens who stutter.”)

Develop a Passion

In the chapter “Famous People Who Stutter” (page 165), you’ll learn that many actors and singers developed their talents during high school as a result of stuttering. When a teenager feels passion for an activity, he or she can focus with greater intensity than adults. Your job, as a parent, is to help your teenager focus on a speech-positive activity, instead of focusing on video games or memorizing Black Sabbath lyrics.

Help your teenager become passionately involved in activities that require talking, improve his fluency, and develop his social skills. Such activities include singing, acting, debating, or foreign languages. Or organizing a teenage stuttering support group. Or doing a science project about stuttering. See

[http://en.wikibooks.org/wiki/Speech-
Language_Pathology/Stuttering/High_School_Science_Projects](http://en.wikibooks.org/wiki/Speech-Language_Pathology/Stuttering/High_School_Science_Projects)

Involve Peers in Speech Therapy

Are your teenage clients less than enthusiastic about speech therapy? Well, duh, if you’re a speech-language pathologist then you’re at least 25! You might even be over 30! Why would a teenager want to talk to someone so old?

Instead, have a teenager bring a friend to speech therapy. He’ll talk to his friend about skateboarding or video games or other stuff you’re clueless about. Better yet, you can train the friend to give your client a subtle reminder when he needs to slow down or get back on-target (see “My Romantic Disaster of 1996,” page 117).

Or roleplay teenage situations, such as different ways of asking a peer out on a date.

Paramount in teenagers’ minds is connecting to peers (other teenagers), e.g., being seen as “cool” by their classmates. Use speech therapy as a way to connect to peers and your teenager will

want to do speech therapy. For example, instead of (thinking of himself as) being seen as a boy who stutters, help your teenager think of himself as a boy who's not afraid to ask girls out on dates.

Learn American Sign Language

I took four years of German in high school and college. Being unable to talk, I learned nothing.

No one suggested that I study American Sign Language instead. I could have been 100% fluent in that! Being good at something would have improved my self-esteem. In contrast, I felt like the stupidest person in German class. And if I learned sign language I would've made friends in the deaf community, or maybe worked part-time as a sign language interpreter.



Auditory Processing and Anti-Stuttering Devices

Our ears hear sounds. The *central auditory processing* area of our brains processes those perceived sounds into useful information, such as words. Central auditory processing disorder (CAPD) is not a single disorder but rather is an umbrella term for anything wrong with how our brains process auditory information. A wide variety of disorders seem to have a CAPD component, including ADHD and language disorders.¹²⁹ CAPD is not a hearing disorder, i.e., a person with CAPD usually has nothing wrong with his or her ears.

Brain scans have found that adult stutterers appear to have abnormal underactivity in their central auditory processing area. What's wrong with adult stutterers' auditory processing is unknown. If I had to guess, I'd say that stutterers have something wrong with how we hear our own voices. One study suggested that adult stutterers have an inability to integrate auditory and somatic processing,¹³⁰ i.e., comparing what we hear ourselves saying to how we feel our muscles moving.

If this is true, then stuttering is one of many *sensory integration disorders* (SID) that originate in childhood. Perhaps stuttering therapy should include exercises to train one to listen to one's speech and feel one's muscles moving.

Other CAPD Symptoms

I have other symptoms associated with mild CAPD. I prefer to watch movies with the subtitles on. I can't "pick up" foreign languages by ear; I have to study a written language before I can hear words, and then only if spoken slowly. If there's background noise, such as wind, I can't understand what people are saying.

Other symptoms of CAPD include sensitivity to certain noises; difficulty identifying the direction of sounds; difficulty following

multi-step directions, especially if given in one sentence; and reading, spelling, and speech problems.

Altered Auditory Feedback

Changing how stutterers hear their voices improves fluency. This can be done in many ways:

- Speaking in chorus with another person.
- Hearing your voice in headphones distorted.
- Hearing a synthesized sound in headphones mimicking your phonation (masking auditory feedback, or MAF).
- Hearing your voice in headphones delayed a fraction of a second (delayed auditory feedback, or DAF).
- Hearing your voice in headphones shifted higher or lower in pitch (frequency-shifted auditory feedback, or FAF).

These phenomena are called *altered auditory feedback*. No brain scans have looked at stutterers' auditory processing while speaking with altered auditory feedback.¹³¹ Hypothetically, introducing errors targeted at the area that integrates auditory and somatic processing increases blood flow to that area, increasing activity level to normal.

In other words, hearing what you're saying out of sync with what you feel your muscles doing raises a red flag. The red flag is raised in an area that's abnormally underactive in stutterers. It's like a poor little overlooked village suddenly saying, "The British are coming! Eureka! There's gold in them thar hills! We've struck oil! Aliens have landed!"

Picture wagon trains, locomotives, and paratroopers descending on this sleepy little burg. In brain terms, more blood flows to this area.

The errors must *not* raise red flags in other brain areas, such as language processing. I built a device that, when you walked up to Fred and said, "Hi, Fred," the device whispered in your ear, "Hi, Steve." It didn't improve fluency. It stopped everyone—stutterers and non-stutterers—from talking.¹³²

Non-stutterers can't tolerate altered auditory feedback. I've amused many non-stutterers by putting an anti-stuttering device on them and telling them to count to twenty. Most can't get to ten. They repeat or skip numbers, or giggle uncontrollably, then rip the headphones off.

If my hypothesis is correct, then altered auditory feedback increases blood flow to non-stutterers' auditory/somatic integration area, raising activity to an abnormally high level. Too much activity is as bad as not enough activity. Interestingly, the effects of too much activity in this area are somewhat like stuttering—repeating words and unexpected silent pauses.

Planum Temporale Abnormality and DAF

The planum temporale (PT) is an anatomical feature in the auditory temporal brain region. Typically people have a larger PT on the left side of their brains, and smaller PT on the right side (leftward asymmetry). A brain scan study found that stutterers have the opposite: their right PT is larger than their left PT (rightward asymmetry).¹³³

A second study found that stutterers with this abnormal rightward asymmetry had significantly improved fluency with DAF, but stutterers with the normal leftward asymmetry didn't improve with DAF.¹³⁴ The study also found that stutterers with this abnormal rightward asymmetry stuttered more severely than stutterers with the normal leftward asymmetry.

Delayed Auditory Feedback

Delayed auditory feedback (DAF) seems to have two distinct effects, depending on whether the delay is short (25 to 75 milliseconds, or about a twentieth of a second) or long (75-200 milliseconds, or about a tenth of a second).

A short delay immediately reduces stuttering about 70%,¹³⁵ without training, mental effort, or abnormally slow or abnormal-sounding speech. You just put on the headphones and talk. Hypo-

thetically, this effect results from correcting a central auditory processing abnormality. While this effect is impressive, it doesn't 100% eliminate stuttering, and the effect goes away when the headphones are removed. A short delay appears to correct one factor in stuttering.

A longer delay induces a slower speaking rate with stretched vowels (continuous phonation, page 94). This requires training and sounds abnormally slow and monotonic.

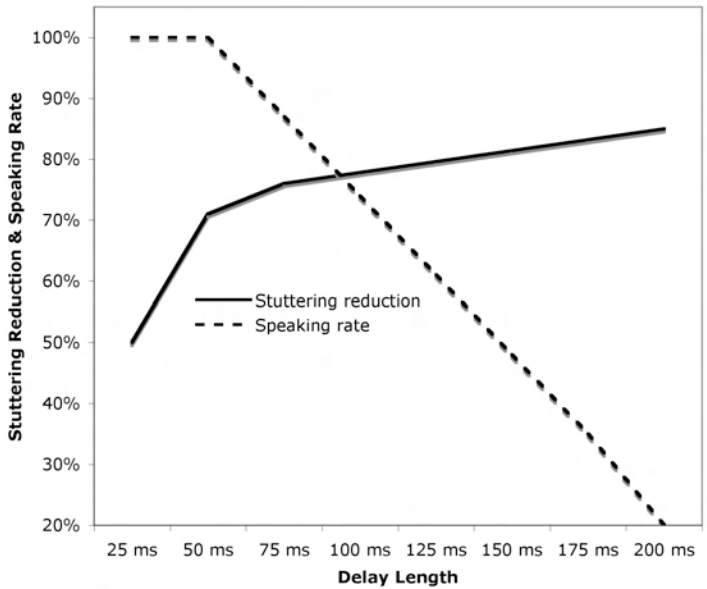


Figure 1: DAF Effectiveness

The chart shows that at normal speaking rates, a short delay can reduce but not eliminate stuttering. A longer delay can reduce stuttering further, at the expense of speaking rate.¹³⁶

Using DAF in Therapy

DAF stuttering therapy begins with training a stutterer to use the slower speaking rate with stretched vowels target (page 94), without using DAF. When the stutterer can complete a simple speaking task, such as counting to ten, using this target correctly, then he can use a DAF device. DAF therapy then has several goals:

- To increase the length and complexity of sentences while

using the DAF device to support on-target fluent speech.

- To increase the stress of the speaking situation while using the DAF device to support on-target fluent speech.
- To reduce the need for the DAF device, until the stutterer no longer needs the device.

In other words, the stutterer first uses the DAF device for short phrases in the speech clinic. Typically this is one or two seconds per syllable, with the delay set at 200 milliseconds. He must achieve all fluent speech targets, e.g., all syllables stretched equally, all syllables stretched to one second, no pauses between words, and no disfluencies.

The stutterer then uses the device in longer conversations in the speech clinic, again achieving all the fluent speech targets. Then he uses the device in more stressful speaking tasks, such as role playing with his speech-language pathologist (page 143).

When the stutterer achieves these goals, then he decreases the delay and increases his speaking rate. But if he has any disfluencies he goes back to the longer delay and slower speaking rate.

The stutterer can also decrease the volume, and use the device in one ear instead of both ears. He can use the device at the beginning of conversations, and then turn it off when he feels capable of speaking on target with the support of the device. He can discontinue using the device in low-stress conversations; then in medium-stress conversations; and finally reserving the device only for stressful conversations such as public speaking. Eventually he should need the device only occasionally.

Mistakes in DAF Use

Don't use DAF at normal speaking rate with a long delay. If you want to talk at a normal speaking rate, set the DAF delay between 50 and 75 milliseconds.¹³⁷ Don't use a delay longer than 75 milliseconds unless you're using closed-loop slow speech (page 90).

I've seen this scenario over and over. A stutterer gets a 50% fluency improvement at 50 milliseconds. He gets a 75% improvement at 75 milliseconds. He sees that the dial goes up to 200

milliseconds. He thinks, “I’ll crank this baby up! I’ll redline it! I’ll turn it up all the way to 200 milliseconds and I’ll be 200% fluent!”

200 milliseconds is for speech five to ten times slower than normal. Non-stutterers can’t talk normally with a 200-millisecond delay¹³⁸ but most stutterers are capable of forcing themselves to “tune out” the delay. This appears to be due to our auditory processing underactivity. In other words, if you use DAF incorrectly you might make your auditory processing underactivity worse. This might explain why some stutterers have reported that a DAF device lost effectiveness or “wore off” over time.

Another mistake is to use a DAF device in low-stress situations (such as reading aloud) and expect carryover to high-stress situations. Carryover works the other way. Use an anti-stuttering device in situations in which you stutter, and don’t use it in situations where you speak fluently.

Long-Term Effects of DAF

Nine adult stutterers used DAF devices thirty minutes per day, for three months.¹³⁹ The thirty minutes typically consisted of ten minutes reading aloud, a ten-minute conversation with a family member, and a ten-minute telephone call. The subjects received no speech therapy.

The device used was the School DAF, made by Casa Futura Technologies (my company), with a binaural (two ears) headset. The subjects were allowed to set the delay where they wanted. Most selected delays around 100 milliseconds.

At the start of the study (0 months), the subjects stuttered on 37% of words, on average. With the DAF device their stuttering dropped to 10%. In other words, the device improved their fluency about 70%.

Three months later the subjects stuttered on 17% of words, when not using the DAF device. When wearing the DAF device they stuttered on 13% of words.

This shows that, when not wearing the devices, the subjects’ stuttering diminished from 37% of words to 17% of words, or a

55% improvement. This is “carryover fluency,” in other words, the device trained users to need the device less and less.

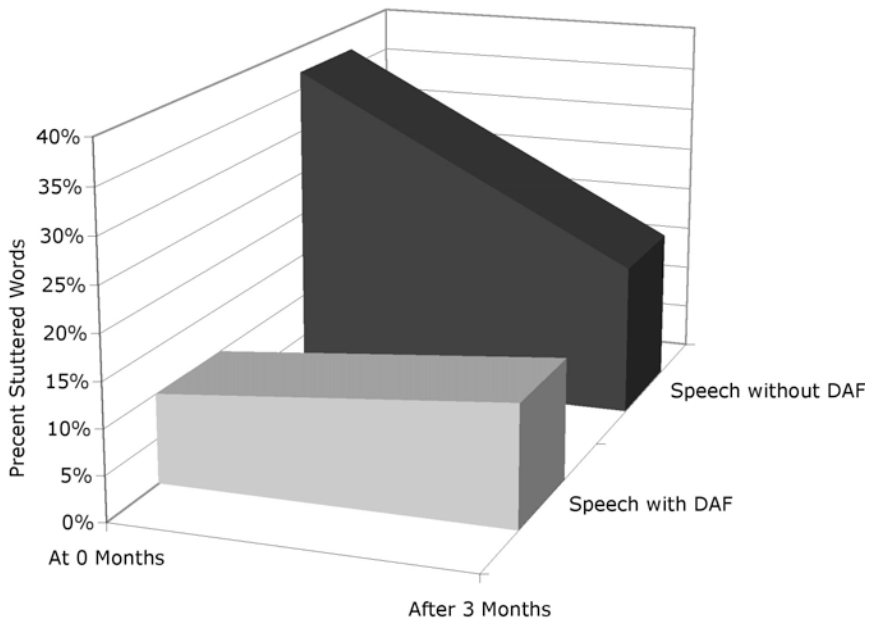


Figure 2: Long-Term Effects of DAF

The increase (from 10% to 13%) in stuttering when wearing the devices wasn’t statistically significant. Examining this more closely, stuttering when wearing the device increased only for “automatic speech,” such as reciting days of the week, and for repeating words and sentences after the examiner. No change in effectiveness was found in conversations or in a “picture description” task. This suggests that any “wearing off” effects occurred in non-conversational (less important) speaking situations.

The “carryover fluency” effect was the same across all speaking tasks.

In another study, an eleven-year-old boy received fourteen hours of structured therapy with mediated learning and a Casa Futura Technologies School DAF. His stuttering diminished from 9% disfluencies to 5% disfluencies (when speaking without the device, a 47% improvement). One year later he still had 5%

disfluencies. Another fourteen hours of treatment reduced his stuttering to 4% disfluencies.¹⁴⁰

Two other studies combined speech therapy with a DAF device. One study was of adults,¹⁴¹ the other of children.¹⁴² Both studies found that combining DAF and stuttering therapy trained the subjects to speak fluently (less than 2% stuttering) and no longer need the devices.

Frequency-Shifted Auditory Feedback

Frequency-shifted auditory feedback (FAF) shifts the pitch of your voice in your earphones. A FAF *upshift* makes you hear your voice sounding like Mickey Mouse. A FAF *downshift* makes you hear your voice sounding like Darth Vader.

A quarter-octave pitch shift reduces stuttering about 35%. A half-octave pitch shift reduces stuttering about 65-70%. A full-octave pitch shift reduces stuttering about 70-75%. Combining DAF and FAF reduces stuttering about 80%.

Shifting pitch up or down is equally effective in short-term studies. But there may be long-term differences between up- and downshifts. FAF causes non-stutterers to speak at a higher or lower vocal pitch, depending on whether the device is set for an up or down frequency shift.¹⁴³ This higher or lower pitch vocal pitch results from changing vocal fold tension. In other words, FAF induces changes in vocal fold tension in non-stutterers.

A study found that my company's FAF devices, set for a half-octave downshift, didn't cause a change in vocal pitch in stutterers.¹⁴⁴ But speech clinics have reported that my FAF devices induce vocal fold relaxation in stutterers. Usually, stutterers need a greater pitch shift, between one-half and one octave down. Also, the study used older headphones which lacked the bass response of today's headphones. A new study might find that current devices, set to one-half or one octave down, induce vocal fold relaxation.

I've also seen FAF downshifts induce a slower speaking rate, similar to DAF. If this effect is consistent, then a FAF downshift

should produce long-term carryover fluency.

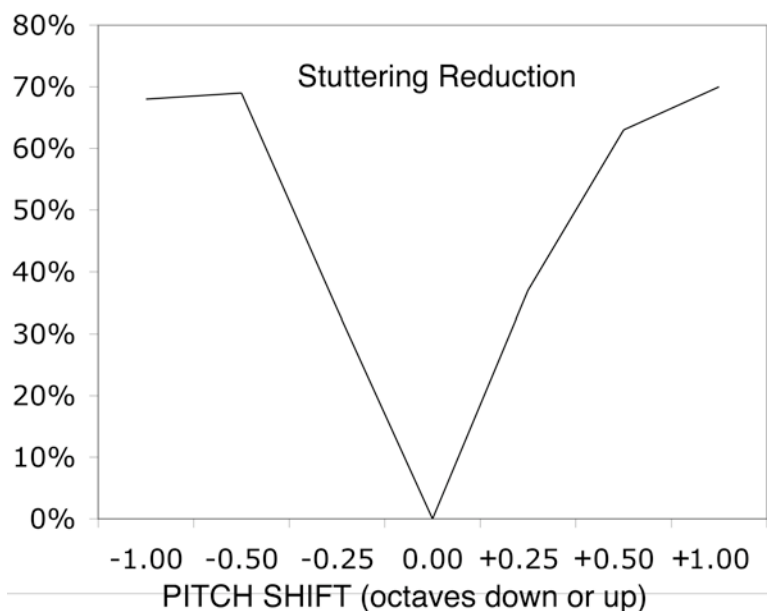


Figure 3: FAF Stuttering Reduction

Conversely, a FAF upshift (the Mickey Mouse voice) appears to induce vocal fold tension. I've seen FAF upshifts induce faster speaking rates. If this effect is consistent, then a FAF upshift should result in poor long-term performance (e.g., no carryover fluency, and possibly "wearing off").

Types of FAF

All published studies of FAF used *octave-scale* FAF. Octave-scale FAF requires lots of computing power (a *fast Fourier transformation*). My company's devices use octave-scale FAF. When you set my devices to a one-octave upshift, the 125-Hz fundamental frequency of an adult male voice is shifted up to 250 Hz. The 250 Hz first overtone of your voice is shifted to 500 Hz. The 500 Hz second overtone of your voice is shifted to 1000 Hz. And so on.

If you instead use a one-octave downshift, your 125 Hz voice is shifted in your earphones to 62 Hz. Your 250 Hz first overtone is

shifted to 125 Hz, and so on.

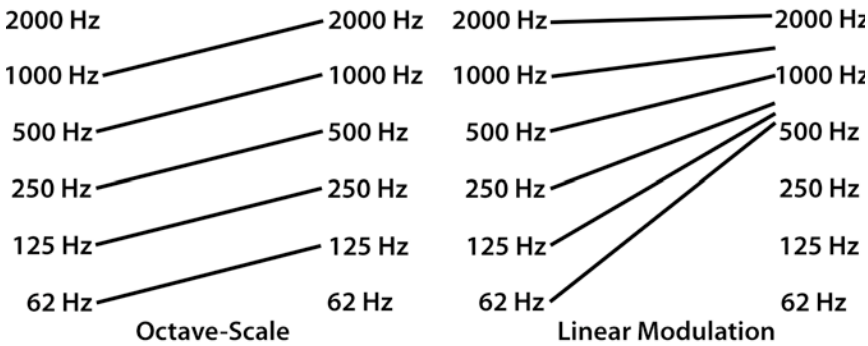


Figure 4: Octave-Scale vs. Linear Modulation FAF

But some other anti-stuttering devices don't have enough processing power to produce octave-scale FAF. Instead, these devices use *linear modulation*. The upshift adds 500 Hz to your voice (or 1000 Hz or 2000 Hz, depending on the setting). Thus, your 125 Hz fundamental frequency is shifted to 625 Hz—more than two octaves up! Your 250 Hz first overtone is shifted to 750 Hz. Your 500 Hz second overtone is shifted to 1000 Hz.

When you downshift or *subtract* 500 Hz from your voice, your 125 Hz fundamental frequency vanishes. 125 Hz minus 500 Hz is nothing (there are no negative frequencies). The 250 Hz first overtone of your voice also vanishes. And the 500 Hz second overtone of your voice vanishes. You can only hear the weak third (1000 Hz) and higher overtones of your voice. When I tried another company's anti-stuttering device, I heard my voice in my ear *rise* in pitch as the FAF was adjusted lower!

No published studies have investigated whether linear modulation has an effect on stuttering. A speech-language pathologist who works with such devices reported that downward linear modulation "does not enhance fluency."¹⁴⁵

Long-Term Effects of DAF Combined with FAF

Nine stutterers used a DAF/FAF device about seven hours per day,

for twelve months.¹⁴⁶ The delay was set at 60 milliseconds and the frequency compression FAF at 500 Hz up. The subjects received brief speech therapy, specifically to prolong vowels and use “starter sounds” such as “um” and “ah.”

At the start of the study, the DAF/FAF device reduced stuttering about 85%. Twelve months later, the subjects experienced no statistically significant “wearing off” of the devices’ effectiveness. The subjects’ speech without the devices didn’t improve.

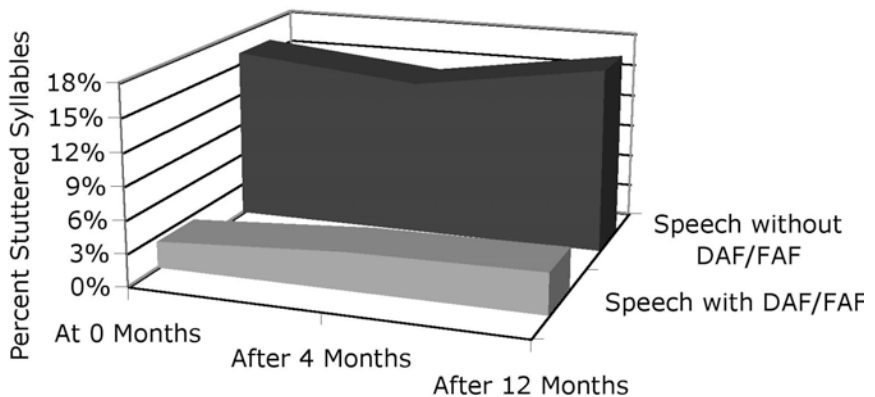


Figure 5: Long-term effectiveness of DAF/FAF device

Another study of the same type of device raised questions of whether long-term use could make stutterers’ speech *worse*. Of six stutterers who used the device 10–23 months, two had speech about the same and four had speech much worse than before using the device. On average, stuttering increased about 50% after 18 months.¹⁴⁷

Why did one anti-stuttering device produce 55% carryover fluency (page 60), when another anti-stuttering device produced no carryover, or possibly made the subjects’ speech worse? Speculatively, upward FAF has positive immediate effects but negative long-term effects. Hearing your voice shifted up may improve your auditory processing but make your speech motor activity worse (i.e., make you speak with tighter vocal folds). If the auditory processing effect goes away when the device is removed, but the speech motor changes are retained, then no carryover would result.

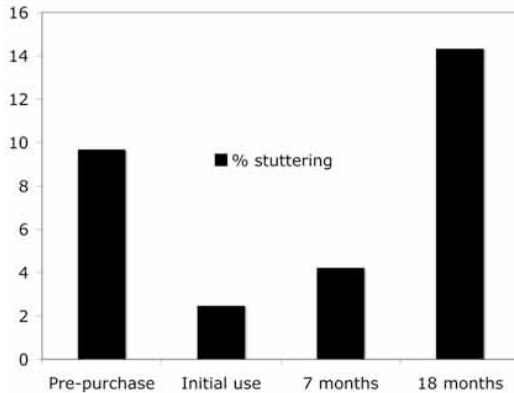


Figure 6: Long-term effectiveness of a DAF/FAF device

Or possibly the subjects using anti-stuttering devices for thirty minutes of practice per day slowed down their speech, improving their fluent speech motor skills; while subjects wearing anti-stuttering devices all day spoke at normal speaking rates, possibly making their auditory processing worse (page 59).

Masking Auditory Feedback (MAF)

If you have silent blocks, in which you can't make a sound, you'll want a device with masking auditory feedback (MAF). You push a button and the device pulls you out of the block.

MAF is a synthesized sine wave at your fundamental frequency (not "white noise"). This sound fools your brain into thinking that your vocal folds are vibrating. Your vocal folds relax and start vibrating.

The Edinburgh Masker, popular in the 1980s, helped many stutterers improve their speech over time, until they no longer needed the device. Other stutterers found that the device "wore off" and became ineffective. Still other stutterers have used the device for more than twenty years with no carryover or "wearing off." No research investigated why the device had different effects on different people. My guess is that some users used the devices to support therapy skills, but others used the devices to avoid therapy

and support poor motor skills.

Sound Quality

A study found that a DAF/FAF anti-stuttering device made by my company was more than twice as effective as a DAF/FAF device made by another company.¹⁴⁸ The difference in effectiveness may have been due to differences in sound quality. Listening to Beethoven played by a symphony orchestra isn't the same as hearing Beethoven as a cellphone ringtone.

Frequency Range

Different anti-stuttering devices have different frequency ranges. Generally, the bigger the microphone and earphones, the wider the frequency range.

My company's devices have a flat frequency response from 60 to 5000 Hz. This is the human vocal range, plus additional low range for FAF downshifting.

In contrast, hearing aids typically have a frequency range of 200 to 7000 Hz. The frequency ranges typically aren't flat, but instead are tuned to sound best somewhere between 3000 and 4000 Hz¹⁴⁹ (where most people lose their hearing). Hearing aids can't reproduce the low range of human voices, especially the fundamental frequency of phonation that's key to stuttering therapy.

Monaural vs. Binaural Sound

Binaural (two ears) sound is 25% more effective than monaural (one ear) sound.¹⁵⁰ My company's devices can be used either binaurally or monaurally. Other devices are monaural only.

Background Noise

Some anti-stuttering devices work well in quiet speech clinics, but are unusable in a noisy classroom or restaurant.

Noise-Canceling Microphones

Positioned correctly, a *noise-canceling directional microphone* eliminates background noise at the source. In contrast, the *omnidirectional microphones* in hearing aids, lapel microphones, and the smaller cellphone earsets pick up background noises louder than your voice.

Push-To-Talk Button

A “push to talk” button also eliminates background noise. You push a button and the device switches sound on. You let go of the button and the sound switches off.

In noisy environments you’re usually in a group. For example, you go out to a restaurant with three friends. You talk one-fourth of the time. Most of the time you sit and listen, with clear hearing. When you have something to say, you push the button.

A push-to-talk button also works well for a child in school, who mostly listens and occasionally is called on by the teacher.

High-Frequency Filters

Most anti-stuttering devices have high-frequency filters to reduce noise above your vocal range.

Voice Activation

Voice activation switches on sound when the user talks, and switches off sound when the user stops talking. Voice activation works well if the device has a noise-canceling directional microphone. If the device has an omnidirectional microphone, loud noises switch on sound.

My company’s Pocket Speech Lab analyzes your vocal fold tension and switches on DAF/FAF when you tense your vocal folds, before you stutter. It switches off sound when you’re speaking with relaxed vocal folds, or not talking.

Dynamic Expansion

Some devices have dynamic expansion. This makes loud sounds

louder and quiet sounds quieter. If you're using a noise-canceling directional microphone this makes your voice louder and background sounds quieter. With an omnidirectional microphone it can make your voice quieter and background noise louder.

Acoustical Transparency

Listening to someone talk, while you wear a DAF device that's picking up the other person's voice, is like reading the following:

~~difficult to hear another person speaking~~

That says, "difficult to hear another person speaking." You hear the person speaking twice, with the words out of sync.

In contrast, quarter-octave FAF pitch shifts have little impact on your hearing.¹⁵¹ It's like hearing a tune played simultaneously on a violin and on a viola. This is called "acoustically transparent."

Hearing Safety

Some anti-stuttering devices occlude (block) the ear that the device is in. Some anti-stuttering devices pick up, distort, and amplify background noise. Either results in temporary hearing impairment while wearing the device. If a child can't hear his teacher, he'll fall behind in school. Or he might get hit by a bus that he didn't hear coming.

Permanent hearing damage is also a concern. Underwriters Laboratories tested one of my company's anti-stuttering devices and found that the maximum volume couldn't cause hearing damage. But regardless of what lab tests found, have your hearing tested before buying an anti-stuttering device. If you experience ringing in your ears or pain from loud noises (e.g., a siren going by), discontinue using the device and get your hearing re-tested.

Should Children Use Anti-Stuttering Devices?

Children under six shouldn't use anti-stuttering devices. Preschool

stuttering therapy is usually 100% effective, so anti-stuttering devices are unnecessary.

Six- to thirteen-year-olds can use anti-stuttering devices under the supervision of a speech-language pathologist or a parent trained by a speech-language pathologist, or for *limited* unsupervised uses such as a classroom presentation. If your child gets speech therapy in school only twenty minutes each week, buying a device can enable your child to do therapy at home for thirty minutes every day, e.g., ten minutes reading aloud, a ten-minute conversation with a family member, and a ten-minute telephone call (perhaps to a grandparent).

We don't know whether children who stutter have the same neurological abnormalities that adult stutterers have. Altering a child's brain activity might cause his brain to develop in a different way. Extensive use of an anti-stuttering device might cause the child's brain to develop normal auditory processing and the child to outgrow stuttering. But perhaps extensive use of an anti-stuttering device would cause the child's brain to develop in another, unknown abnormal way. Until we know more about the brains of children who stutter, I suggest that children only use anti-stuttering devices if they want to, and the parents clearly hear improved fluency with on-target speech motor skills (e.g., relaxed vocal folds) when using the device.

Third-Party Payment

Most Americans who stutter can get anti-stuttering devices free.

Many states have *special telephone equipment distribution programs* that provide my company's telephone-compatible anti-stuttering devices free to qualified residents. Some programs have income restrictions. These states include Arizona, California, Georgia, Maryland, Massachusetts, Missouri, North Carolina, Pennsylvania, Texas, and Wisconsin.

If you're unemployed, your state's *vocational rehabilitation* program will help you get a job, including paying for speech therapy

and/or an anti-stuttering device.

In every case we know of, when a stutterer asked his or her *employer* for assistance paying for one of our devices, the employer was more than happy to help. Often the employer then offers the stutterer a promotion.

Many of our devices are paid for by *health insurance*. Speech clinics handle this billing. Casa Futura Technologies never directly bills health insurance plans.

We've had good experiences with *service organizations* including Sertoma (SERvice TO MAnkind) and Lions Clubs. Our experience has been that service organizations prefer to help low-income children and teenagers, and that they prefer to be approached by the child's speech-language pathologist.

We've also had devices paid for by Veterans Administration Medical Centers and Medicaid.

I'm not an expert on how foreign countries pay for health care. (In fact, I'm completely bewildered!)

For more about these and other programs, see my website

<http://www.casafuturetech.com/Catalog/discounts.shtml>



Dopamine and Anti-Stuttering Medications

The neurotransmitter *dopamine* makes you feel alert, motivated, and mentally acute. When you feel “energy,” your brain has plenty of dopamine. Caffeine, cocaine, and amphetamines produce their “buzz” by affecting your brain’s dopamine.

Adults who stutter have elevated levels of dopamine,¹⁵² and, as noted earlier (page 32), a study found that three genes that affect dopamine correlate with five disorders: attention deficit hyperactivity disorder (ADHD), Tourette’s syndrome, stuttering, obsessive-compulsive disorder (OCD), and tics.¹⁵³ All five disorders result in undesirable behaviors that manifest when the person experiences stress but not when the person is relaxed. Trying to control the behavior or movement makes it worse and more difficult to control.*

Dopamine antagonist medications reduce stuttering. However, these medications have side effects, and the long-term effects are unknown. Rather than taking medication indefinitely, it may be better for a severe adult stutterer to combine medication with other stuttering therapy and reduce his dosage as his fluency improves, until he no longer needs the medication.

“Good Days, Bad Days”—and the Anti-Stuttering Diet

Stutterers have “good days”—with less stuttering—and “bad days”—when they can’t get a word out. The “good days/bad days” syndrome may be due to varying levels of neurotransmitters.

Dopamine is affected by several factors, including diet. Dopa-

* Invite a Tourette’s support group to meet with your stuttering support group.

mine is produced from the amino acids phenylalanine and tyrosine. Both amino acids are components of protein. Meat sources of protein have more tyrosine than plant sources of protein. The exception is wheat germ, which is high in tyrosine. The foods highest in phenylalanine are soy and fish.

A vegetarian, wheat-free, low-protein diet should lower dopamine levels. I tried this. I stuttered less, but felt sluggish and depressed. I'd rather eat protein, feel mentally alert, and stutter.

In *The Edge Effect* (2005; ISBN 1-4027-2247-8), psychiatrist Eric Braverman presents the four neurotransmitters (dopamine, acetylcholine, GABA, and serotonin) and suggests that health and well-being relates to balancing the four via diet, supplements, and/or medication. The book includes a questionnaire that shows which of your neurotransmitters are higher or lower (no one is perfectly balanced) and if any are out of normal range. You can do the questionnaire free on the Los Gatos Longevity Institute website, http://www.antiagingnow.com/secure/test_forms/edge_effect_intro.html.

My score indicated that dopamine was my lowest neurotransmitter and acetylcholine was my highest, but all were within normal range. If this is true, then lowering my dopamine wouldn't make sense. But if your score showed high dopamine, then maybe diet, supplements, and/or medications are something you should look into. If you do the questionnaire, e-mail me the results. It'll be interesting to see if stutterers have on average high or low dopamine levels.

Dopamine Antagonists

Dopamine antagonists reduce dopamine activity. In general, these medications reduce stuttering.

Haldol

Haloperidol (Haldol) is an old dopamine antagonist. It was the first medication to reduce stuttering in two clinical trials.

The side effects can be severe. A stutterer took it for several days, then one night found his head rotating slowly back and forth 180 degrees—and there was nothing he could do to stop it!* The effect on his speech had been minimal, so he stopped taking the medication.

Risperdal

Newer medications more narrowly target certain dopamine receptors. The dopamine D₂-receptor antagonist risperidone (Risperdal) reduced stuttering about 50% in one study.¹⁵⁴ Another study found only slightly improved speech.¹⁵⁵ Like other stuttering therapies, the drug is most effective in low-stress situations, and least effective in high-stress situations.

The drug is FDA-approved only for short-term (6-8 week) treatment of schizophrenia. Side effects include insomnia, agitation, anxiety, somnolence, extrapyramidal nervous system disorders, headaches, dizziness, constipation, rhinitis (a breathing disorder), rashes, tachycardia (a heart disorder), and breast growth in men and women (due to increased levels of the hormone prolactin), and neuroleptic malignant syndrome (potentially fatal).

A stutterer tried Risperdal, and couldn't leave his house due to severe anxiety.

Another male stutterer wrote, "I used Risperdal for about 6 months. It had a marginal (if any) effect on the intensity of my stutter. I had to discontinue its use due to hormonal side-effects (my right breast started to grow)."

Zyprexa

In one study of 24 adults for three months, olanzapine (Zyprexa) reduced stuttering on average 33%.¹⁵⁶ Side effects were minor, mostly limited to slight weight gain and drowsiness.¹⁵⁷ After the study completed, many of the subjects opted to continue taking the medication.

* This is called *tardive dyskinesia*.

Pimozide

Pimozide (Orap) has been reported effective in several studies,¹⁵⁸ one of which reported a 21% increase in fluent speaking time.¹⁵⁹ This older antipsychotic is considered to be a “drug of last resort” due to severe side effects,¹⁶⁰ including serious depression and adverse motor symptoms.¹⁶¹

Tiaprider

Tiaprider¹⁶² was found to reduce stuttering 5% in a group of ten German adolescents.

Dopamine Agonists

Dopamine agonist medications increase dopamine activity (the opposite of dopamine antagonists). Increasing dopamine might increase stuttering. One study found that apomorphine, a dopamine receptor stimulator, didn't increase stuttering.¹⁶³

No other research has explored the effects of dopamine agonists on stuttering. Based on anecdotal reports, stutterers may want to consider avoiding dopamine agonists, including caffeine, cocaine, and amphetamines.

Ritalin

Ritalin is a dopamine agonist. A speech-language pathologist asked on the Internet:

I'm treating an 8-year-old diagnosed ADHD and who suddenly began stuttering (advanced core and secondary behaviors) without any prior history of dysfluency, as a side effect of the medication Ritalin. He's had a whole neuro work-up which revealed nothing.

Another speech-language pathologist responded that many of the children he treated for stuttering were on Ritalin for ADHD.

Pharmacist Richard Harkness advises against Ritalin for children who stutter:

Ritalin increases dopaminergic neurotransmission and is contraindicated for use in those with Tourette's disorder. Ritalin has also, in rare cases, brought on symptoms of Tourette's disorder. Tourette's disorder has been likened to stuttering in that it involves a flaw in dopaminergic neurotransmission.

If you suspect that your child's medication contributes to his or her stuttering—especially if your child is on several medications—I suggest that you consult a pharmacist who specializes in stuttering and medications, such as Richard Harkness (his website is <http://members.aol.com/rharkn/>).

Other Neurotransmitters

Pagoclon is a gamma amino butyric acid (GABA) selective receptor modulator.¹⁶⁴ A study found that the medication reduced stuttering, but didn't say how much it reduced stuttering.

Desipramine is a norepinephrine antagonist. One study found no effect on stuttering.¹⁶⁵

Dopamine and acetylcholine tend to work in balance in some disorders. An increase in one tends to decrease the other. It's possible that stuttering results from too little acetylcholine as well as too much dopamine, and that dopamine antagonists also act as acetylcholine agonists when they affect stuttering.¹⁶⁶

Beta blockers, propranolol, oxprenolol, verapamil, and clonidine had no effect on stuttering.¹⁶⁷

Antidepressants Increase Stuttering

A study of the selective serotonin reuptake inhibitor (SSRI) paroxetine (Paxil) on stutterers was terminated due to severe side effects.¹⁶⁸

A study of the SSRI clomipramine found "modest" improvements in fluency, and these gains seemed to diminish over time.¹⁶⁹

SSRI medications can increase stuttering in stutterers, appar-

ently be boosting dopamine. In a few cases, these drugs caused non-stutterers to stutter.¹⁷⁰

Stutterers taking SSRI anti-depressants report feeling less depression, but their increased stuttering makes them feel worse:

I was sitting in the hallway, in the dark. I had been crying and hitting my head on the wall, screaming to God, why me? I hated my stuttering and I suppose hated myself as well. From that point on it was as if when I remembered that incident all the feelings came back to me and wouldn't leave. Those angry, hurt, frustrating feelings from so long ago wouldn't go away. I was hiding my feelings from everyone around me, pretending to be super mom and super wife. I decided to seek professional help.

We decided that I would try Wellbutrin [bupropion, a norepinephrine and dopamine reuptake inhibitor]. As my doctor put it, kill two birds with one stone, since Wellbutrin is also prescribed to help you quit smoking. The first week I felt like I had so much anxiety that I could explode. The second week I noticed my stuttering getting worse. By the third week the controls that I had learned in speech therapy were virtually unusable. It was so frustrating to not be able to control my stuttering at all. Needless to say we all agreed to flush the Wellbutrin and never go back on anything like that.

Prozac, Trazadone and Effexor did not effect my speech at all.¹⁷¹

Another stutterer wrote:

I have tried 3 antidepressants: Prozac, Wellbutrin, and Zoloft. All increased my stuttering noticeably. The antidepressants that I have tried make me more able to get out of bed in the morning and restore my "get up and go"; however, they have caused me to go from being a person with a barely noticeable stutter to a more pronounced stutter.

I went in to my psychiatrist yesterday and explained that the current antidepressant is making my stutter sig-

nificantly worse. However, in the 10 minutes we talked I was practically perfectly fluent. He then concludes that obviously “it’s not that unmanageable.”

He prescribed 10mg Propanolol to take before I have to be in a difficult speaking presentation. It is supposed to “reduce performance anxiety.” I don’t feel like I have a tremendous amount of performance anxiety; stuttering just isn’t very fun. I think he doesn’t believe me about the severity of the stuttering.

Other Medications

Botulinum Toxin

Botox, the toxin in botulism, has been injected into stutterers’ vocal folds. The toxin partially paralyzes your vocal folds so you can’t get into hard blocks. You also can’t talk loudly or forcefully. The toxin reduces stuttering somewhat. It wears off in a few months, and you get a second shot. The second shot reduces stuttering less than the first. By the third shot, the toxin usually has no effect on stuttering.

Tranquilizers

Some doctors prescribe tranquilizers to stutterers on the erroneous belief that nervousness causes stuttering.

A psychiatrist had some pills he thought might help. Einer was to take one per day during the week remaining before the great day, and one extra big super pill on the morning of the wedding. The pills made him feel somewhat relaxed but had no noticeable effect on his speech. The wedding arrived, Einer took his super pill, and went off to London on the train to meet his relatives who had come for the ceremony.

An hour before the wedding Einer had still not returned. I kept the smiling calm that I had learned to assume in the face of all our difficulties and began dressing. Half an hour later I stood in white satin complete with veil and bouquet, looking out of the bedroom window towards the railway station, wondering what could

have happened and preparing myself mentally for a last minute cancellation of the wedding. Had he thrown himself under a train, unable to continue life as a stutterer? Had he run back to Canada as a supreme act of avoidance? The minutes ticked by. Finally another train pulled in, and up the hill walked Einer, a lazy smile on his face, apparently unaware of the panic that he had caused. He had forgotten to take pencil and paper and so was unable to ask for guidance and had become hopelessly lost. However, the super pill had kept him smiling. I am glad to say that thanks to the kindly vicar in reading along with Einer, the wedding vows were the first and only fluent words my family heard Einer speak that summer.¹⁷²

In general, tranquilizers have “more effect on the complexity or severity of the [stuttered] blocks than on their frequency.”¹⁷³

Alcohol

No researchers have studied the effects of alcohol on stuttering. (Finding volunteers wouldn't be a problem at most universities!)

Anecdotally, alcohol reduces stutterers' fears and anxieties (e.g., about talking to persons of the opposite sex) and so reduces stuttering. But alcohol reduces one's ability to use therapy techniques, and so increases stuttering.



Fluency Shaping Therapy

Watch a stutterer struggle to talk. You see that stuttering is primarily overtense, overstimulated respiration, vocal folds, and articulation (lips, jaw, and tongue) muscles. Brain scans of adult stutterers have found overactivity in the left caudate nucleus speech motor (muscle) control area, during stuttering. This suggests there's a neurological basis for these overactive speech-production muscles.

Fluency shaping therapy treats this problem. It trains stutterers to speak with relaxed respiration, relaxed vocal folds, and relaxed articulation muscles.

This chapter is longer than any other chapter. Fluency shaping therapy is where you learn to talk fluently. If you don't master these skills, none of the other treatments—medications, anti-stuttering devices, handling stress better, and psychological interventions—will be fully effective.

Conversely, you may have tried fluency shaping therapy and it didn't work for you. What I call "fluency shaping therapy" is different from the fluency shaping therapy practiced at most speech clinics. I've added a theoretical basis for why fluency shaping works (motor learning and control); new therapy skills (e.g., lower vocal pitch); and a chapter about making fluent speech automatic and effortless ("Beyond Fluency Shaping," page 110).

Motor Learning and Control

Motor learning and control is the study of how brains execute complex muscle movements. Physical therapy and occupational therapy students study motor learning and control. Speech pathology students don't (at least not for treating stuttering).

Sports coaches also study motor learning and control. The principles of motor learning and control are usually illustrated with examples from gymnastics, tennis, golf, or other sports.

Closed-Loop Motor Control

A muscle movement takes about 200 milliseconds (one-fifth of a second) to execute:

1. *Sensation*, or neural transmission from sensory receptors in your eyes, ears, etc., to your brain, takes about 15 milliseconds.
2. *Perception*, which retrieves long-term memories to organize, classify, and interpret your sensations, takes about 45 milliseconds. *Perception* changes *sensation* data into perceived information or meaning.
3. *Response selection* takes about 75 milliseconds. You use current perception and past experiences to formulate a course or action. For example, in baseball, a batter watches the pitcher and decides whether to swing at a pitch, hit or bunt, hit to left field or right, etc. Psychologists differentiate conscious *decisions* from unconscious translations, or relating a particular stimulus to a particular response.
4. *Response execution* of an action plan—a step-by-step sequence of events that make up the planned movement—takes about 15 milliseconds. In these events, motor neurons carry signals from the brain or spinal cord to muscles.

Under *closed-loop motor control* you use perception to consciously, continuously adjust muscle movements. For example, threading a needle. You look at the needle. You look at the thread. You move the thread towards the needle. You look at the needle again. You look at the thread again. You correct your movement. You do this many times until the thread is through the needle.

Each *stimulus-response* adjustment takes at least 200 milliseconds (one-fifth of a second). If you make ten adjustments, the task takes at least two seconds.

Closed-loop motor control has two advantages. It enables precise control, and it enables execution of novel movements (activities you've never done before). For example, threading a needle on the deck of a rolling ship.

Closed-loop motor control has two disadvantages. It's slow, and it requires your full attention.

Closed-loop motor control is good for learning new skills, or for executing skills you rarely need. But you don't want to use closed-loop motor control for fast-paced, frequently used skills.

Open-Loop Motor Control

200 milliseconds—a split second—may seem fast, but it's too slow for many motor tasks. For example, a gymnast's double-back somersault requires muscle movements lasting only tens of milliseconds.

How is it possible to execute a muscle movement in tens of milliseconds, when the sensation to execution cycle requires about 200 milliseconds? Simple—don't do the sensation, perception, and response selection stages. Just do the response execution. This final stage of muscle movements can be performed in as little as 15 milliseconds. This is called *open-loop motor control*. Open-loop motor control is the execution of preprogrammed movements, called a *motor program*, without perceptual feedback.

The colloquial term for this is “muscle memory.” For example, gymnasts practice hours each day for years, until their muscles seem to know what to do without the mind getting involved.

After winning the gold medal in gymnastics at the 1984 Olympics, Mary Lou Retton said that coach

Bela [Karolyi] can really teach, I've learned so much from him. Many long hours were spent in the gymnasium ...repetition, feedback, repetition, and experimentation.

Somehow, after a lot of bumps and bruises, it got easier, as if I could float.

Karolyi added,

Someone should be able to sneak up and drag you out at midnight and push you out on some strange floor, and you should be able to do your entire routine sound asleep in your pajamas. Without a mistake. That's the secret. It's got to be a natural reaction.

Open-loop motor control has two advantages:

1. It's fast. You can execute muscle movements with split-second timing.
2. It requires no attention. Movements under open-loop control are *automatic* and mentally *effortless*.

Open-loop motor control has three disadvantages:

1. If your motor program contains errors, you'll execute the errors. You can't stop and adjust a mistake. You may not even be aware that you made a mistake.
2. Developing open-loop control of a motor skill requires long practice—especially for adults. Children learn some motor skills easily, that adults struggle for years to master.
3. Novel or new situations can't be handled. For example, in the 2000 Olympics, officials set the gymnastic vault two inches too low. The officials didn't correct the height until 18 of the 36 women had performed. These 18 athletes performed poorly, eliminating their hopes of winning medals. The American hopeful, Elise Ray, suffered a "devastating fall."¹⁷⁴

Learning New Motor Skills

Use closed-loop motor control for learning a new motor skill. Then

gradually increase your speed until you can perform the motor skill using open-loop motor control.

For example, a tennis or golf coach will have you start with swinging the club or racquet slowly, while she adjusts your knees, elbows, etc. When you've perfected your form, your coach will have you gradually increase the speed and force, while maintaining form. After extensive practice you'll be executing perfect open-loop motor programs. You'll smash the ball hard and fast and accurately without paying attention to your elbows or knees or anything other than the ball.

Speech Motor Control

Normal speech uses open-loop motor control:

1. Speech is *fast*. Phonemes (speech sounds) are typically 20 to 40 milliseconds.
2. Speech is *complex*, requiring coordination of hundreds of muscles to produce sounds.
3. Speech is *automatic* and *effortless*. Speakers think about what they're saying, not about the muscles they're moving.

Fluency shaping stuttering therapy uses closed-loop speech motor control. You consciously relax your breathing. Then, as you exhale, you slowly increase your vocal fold tension, until your vocal folds hum. Then you slowly move your lips, jaw, and tongue to form the sounds of each word. Stuttering is impossible when using closed-loop speech motor control. Stuttering disfluencies are open-loop speech motor programs.

Making stuttering impossible might sound appealing, but

1. Closed-loop speech motor control is slow. Closed-loop motor control takes about 200 milliseconds per muscle movement. Open-loop speech sounds are typically in the 20-40 millisecond range. Closed-loop speech motor con-

trol slows speech five to ten times, or one or two seconds per syllable.

2. Closed-loop speech motor control demands your full attention. You must pay attention to your breathing, vocal folds, and lips, jaw, and tongue. This isn't a problem when reading a list of words, but is difficult to use in conversations.
3. Your speech loses prosody (emotional intonation). You sound like a robot with dying batteries.

A fourth possible problem may be that stutterers learn speech motor skills slower and retain them less than non-stutterers.¹⁷⁵

Prosody, Parameterization Schemata, and Response Selection

Why closed-loop speech motor control loses prosody is an interesting question.

A study of television talk show guests found that 94% of what viewers remembered was prosody, or what actors call *emoting*, or what lawyers call *affect*.¹⁷⁶ Much—or almost all—meaning is communicated by prosody. *Schemata theory* suggests that you learn certain *invariable characteristics* of a motor skill, and you learn certain execution rules or *parameterization schemata*. You then combine the invariable elements with the rules to produce a motor plan.

For example, in a public speaking class I read algebra problems in an angry voice, in a sad voice, and then with the rhythm and emotional intonation of a stand-up comedian. The algebra problems were invariable—I read the same algebra problems each time. I changed the parameterization schemata to communicate different emotional states. Amazingly, the audience laughed at the “punchlines” when I did the stand-up comedy delivery. Even though the “punchlines” were just numbers, I made the audience think that a punchline was coming, and they laughed at the right times. 94% of the joke was the delivery.

Accents are another parameterization schema that conveys

meaning. For example, a waitress from Oklahoma asked me if I wanted *ah-iss*. When I figured out that she was asking about ice, I affirmatively answered *yay-iss*. I knew the invariable characteristics of “yes,” and when I’d learned the rules of an Oklahoma accent—e.g., break monosyllabic words into two syllables—I was able to say a word I’d never heard.

In normal speech, we produce *prosody* through unconscious *response selection of parameterization schemata*. Different environmental cues cause us to select different responses. For example, you walk into a church and immediately lower your vocal volume. But if no one else is in the church, you could yell “I hate to wear pants!” while turning somersaults down the aisle. OK, that’s one of my eccentric hobbies, but most people wouldn’t do that.

Another example is a person who grew up spending summers in Vermont and winters in Georgia. When she’s in New England she speaks in a Yankee accent. When she’s in the South she switches to a southern accent. Different environmental cues cause her to unconsciously select different parameterization schema to produce each accent.

Like prosody and accents, stuttering is a parameterization schema. A stutterer responds to environmental cues to unconsciously select fluent speech parameters or stuttering speech parameters, which are then combined with invariable characteristics of words to produce fluent or stuttered speech. Thus you can treat stuttering by training stutterers to respond differently to environmental cues (“Responding to Stress,” page 129), or by training stutterers to use fluent speech parameterization schema (this chapter).

Training a stutterer to not feel fear or anxiety when answering the telephone is changing the response selection to an environmental cue (a ringing telephone). In contrast, training a stutterer to speak with relaxed vocal folds changes a speech parameter.

Snake Oil and Charlatans

Closed-loop speech motor control is the “wizard behind the

curtain” of many stuttering therapy programs. Switch any stutterer to closed-loop speech motor control and he or she will be completely fluent.

You can switch to closed-loop speech motor control by making any speech process conscious instead of unconscious. For example, focusing on relaxed, slow breathing will switch you into closed-loop speech motor control, with your vocal folds and articulators (lips, jaw, and tongue) following right along. Or you can focus on producing “gentle onsets” with your vocal folds. This will switch your breathing and articulators to closed-loop speech motor control. Or you can focus on “reduced articulatory pressure” and your breathing and vocal folds will follow.

Always these “wizards” claim that their therapies are 100% effective if the stutterer “really tries,” that is, if he devotes his full attention to closed-loop speech motor control. If he instead pays attention to a conversation, switches into open-loop speech motor control, and then stutters, then he wasn’t “really trying.”

And the closed-loop speech motor control effect has caused speech-language pathologists to hypothesize that stutterers have something wrong with their breathing, or with their vocal folds, or with their articulators, or even that stutterers’ brains are slow in some way. That latter theory is like saying that student drivers have slower brains than Indy 500 race car drivers because student drivers are safe at 20 mph but crash when driving at 200 mph. Everyone performs slowly when attentively learning a new motor skill, then their speed improves with practice. For stutterers in speech therapy, the new motor skill is fluent speech.

Some speech clinics tell stutterers that they’ll always have to speak slowly. That’s like training a student driver to drive 20 mph, then telling him never to go faster.

Slow Speech Is Not the Goal of Stuttering Therapy

If you learn tennis or golf, you’ll use closed-loop motor control when you’re learning to swing the club or racquet. As you practice, increasing your speed and force, you’ll gradually reinforce open-

loop motor programs.

Similarly, you'll use closed-loop speech motor control when working with your speech-language pathologist. She'll train you to move your respiration muscles, vocal folds, and articulators correctly to produce fluent speech. When you've mastered this at a very slow speaking rate, she'll help you to gradually increase your speaking rate, while staying fluent. The goal is fluent, automatic, effortless, normal-sounding and normal-rate speech. Slow speech is not the goal of stuttering therapy.

Severe stutterers usually don't mind learning closed-loop speech motor control. If your stuttered speech is ten to twenty times slower than normal speech, then closed-loop speech motor control, which is typically five to ten times slower than normal speech, will double your speaking rate. Some severe stutterers are even willing to use closed-loop speech motor control outside of the speech clinic. Record conversations with and without using closed-loop speech motor control. Count your syllables per second. You may find that closed-loop speech motor control feels slower but is actually faster than your stuttered speech.

But mild stutterers don't like closed-loop speech motor control. They can hide their stuttering by avoidance and substitution (of certain sounds, words, or speaking situations). They can sound fluent at a normal speaking rate. Closed-loop speech motor control would "advertise to the world" that they have a speech disorder. If they're embarrassed to admit that they stutter, they won't want to use closed-loop speech motor control.

Mild stutterers should consider that closed-loop speech motor control enables them to say anything they want. For example, a mild stutterer wants to buy a chess set. He's afraid of *s* words, so he calls a toy store and asks if they have "one of those games with kings and knights and castles."

The puzzled clerk responds that the store has many games with kings and castles and knights. After five minutes of conversation, the clerk asks, "Do you mean *chess sets*?" The stutterer says yes. The clerk never knows that the caller is a stutterer, but she thinks

that the caller is an idiot. The stutterer wasted five minutes because he wasn't willing to use ten seconds of slow speech.

Or the stutterer drives to the store and looks for a chess set, without calling first. If the store doesn't have chess sets he wastes an hour, to save ten seconds. Saying what you want slowly is faster than saying something else, or not speaking at all.

Americans speak around 165 words per minute. Fast talkers who speak more than 190 words per minute get complaints from listeners unable to understand them. In contrast, Walter Cronkite trained himself to speak 124 words per minute in his newscasts. "Uncle Walter" may have earned his title as "the most trusted man in America" in part because he spoke clearly.

Analogy to Touchtyping

I've never taken a typing class. I type with two fingers, about 45 words per minute. (I'm probably the world's fastest two-fingered typist!)

I tried to learn touchtyping. My speed dropped to less than ten words per minute. Touchtyping not only slowed me down, it required my full concentration. I couldn't think about what I was writing, only about moving my fingers.

I gave up touchtyping within a week. If I'd kept at it, my speed would have increased and eventually surpassed my two-fingered typing speed. I might have been typing 80 words per minute now. The mental effort would have diminished, until touchtyping was automatic and effortless.

Coaches say they'd rather work with a novice who's never played their sport, rather than with an experienced player who uses incorrect techniques. It's easier to learn a new motor skill correctly than it is to correct an incorrect, deeply ingrained motor skill.

Stuttering is difficult to overcome because we learned to talk incorrectly. We have to learn new, fluent speech motor skills, *and* we have to not use our old, disfluent speech motor skills. We learned these disfluent speech motor skills in childhood, when our brains were growing. Now the disfluent speech motor skills are

hardwired into our brains. Making fluent speech automatic and effortless, for a stutterer, demands more time and effort than learning a new sport or vocational skill.

Using DAF to Slow Speaking Rate

Many speech clinics use delayed auditory feedback (DAF) devices to establish fluency using closed-loop speech motor control. With only a little training a DAF device can help a stutterer maintain perfectly paced, steady, mentally effortless, slow closed-loop speech motor control.

The user's speaking rate can adjusted by turning a knob. A typical protocol is to train a stutterer to use closed-loop speech motor control with a 200-millisecond delay and one to two seconds per syllable. The stutterer practices this until he's 100% fluent. That usually takes only one or two therapy sessions. (A study found that without training a 195-millisecond delay reduced stuttering only 85%.¹⁷⁷)

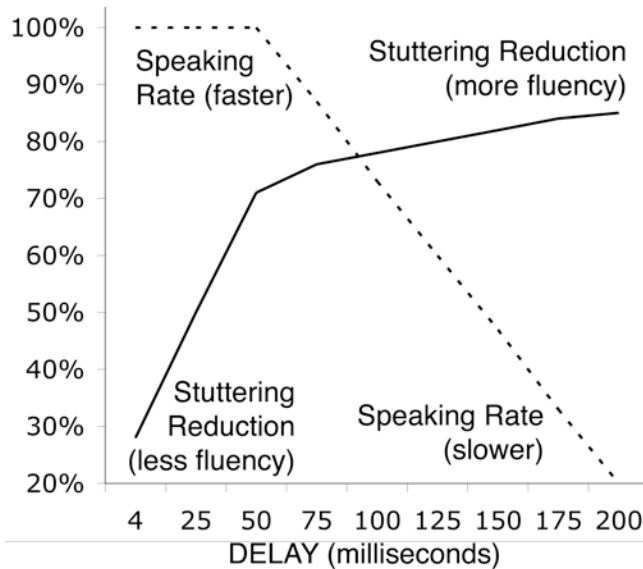


Figure 7: DAF Effectiveness and Speaking Rate

When the stutterer can speak 100% fluently, the speech-language pathologist then has the stutterer use one- or two-second

stretched syllables without the DAF device; in increasingly stressful situations (e.g., calling the speech-language pathologist's answering machine); and then with the DAF device adjusted for faster speaking rates. The stutterer must stay on-target with 100% fluency, or go back to using the DAF device at 200 milliseconds and a one- to two-second speaking rate.

Typically, a 100-millisecond DAF delay is used with half-second per syllable stretched speech, a 75-millisecond delay is used with quarter-second per syllable "slow normal" speech, and a 50-millisecond delay is used with a normal speaking rate.

Three Stages of Motor Learning

We learn new muscle movements, or *motor skills*, in three stages:

1. In the *cognitive stage*, an instructor demonstrates the motor skill to you.
2. In the *associative stage*, you learn to perform and refine the motor skill. You perform the movements under closed-loop control.
3. In the *autonomous stage*, the motor skill becomes automatic. You perform the muscle movements without mental effort, under open-loop control.

For example, imagine yourself learning golf or tennis. You watch the coach hit a few practice balls. Then the coach hands you the club or racket. The coach guides you through a swing, telling you to drop this shoulder or extend that forearm. Soon you can execute the swing perfectly, if you fully concentrate on each movement. You then practice the swing, and your game improves.

A few years later a novice admires your excellent swing and asks you to explain how you do it. "I don't know," you say, "I just do it without thinking about it."

For another example, last summer I tried mountain bike racing. In four races I crashed four times. I then hired a coach. In twelve hours over three weeks, he taught me how to ride down hills, make tight turns, jump my bike over logs, climb hills, plus a few tricks

such as picking up a water bottle off the ground.

Then I quit mountain bike racing. I'd completed the associative stage and learned how to do each skill. Now I would have to practice these skills hours a day, several times a week for years to make the skills automatic in the fast, high-stress environment of racing. In other words, I could do any of the skills if I thought about it, but my body didn't automatically execute the moves without conscious mental effort. I decided that mountain bike racing isn't important enough to me to spend thousands of hours practicing skills.

Stuttering therapy follows a similar course. A speech-language pathologist can show you the fluency skills—relaxed, diaphragmatic breathing; vocal fold relaxation (gentle onsets); and relaxed articulation muscles (lips, jaw, and tongue)—in ten minutes. Teaching you to execute these skills takes a few hours. You can then speak fluently in the speech clinic, when you mentally concentrate on each skill. Almost everyone successfully completes these cognitive and associative stages.

You then have to practice these skills thousands of hours to make them automatic and effortless, in high-stress situations. Many stutterers fail at this stage. But no one intentionally fails for the reasons I quit mountain bike racing. No one rationally weighs the alternatives and says, "Talking isn't important to me. I'll learn sign language instead, or write notes."

Instead, stutterers fail at the autonomous stage because speech clinics don't train this well. Speech clinics call this *transfer*. Perhaps your speech-language pathologist takes you to a shopping mall for a few hours. But the autonomous stage requires thousands of hours of conversations, including high-stress conversations. Stutterers habitually avoid such conversations. You may find that the skills you learned in the low-stress speech clinic fail in high-stress conversations. Your therapy progress begins to fail. You revert to old habits and avoidances. Your stuttering returns.

The next chapter will detail the autonomous stage. The rest of this chapter is about the cognitive and associative stages.

Fluency-Shaping Techniques

Fluency shaping therapy programs typically begin with slow speech with stretched vowels, then work on relaxed, diaphragmatic breathing, then work on vocal fold awareness and control, and finally work on relaxed articulation (lips, jaw, and tongue).

These techniques are all abnormal. They all produce “weird”-sounding speech. The idea is to go to extremes when practicing (in the speech clinic or at home), and then in “real world” conversations you reduce the techniques so that you sound normal, and speak fluently.

Choosing a Speech-Language Pathologist

Find a speech-language pathologist who specializes in stuttering. About 100,000 speech-language pathologists are licensed by the American Speech-Language Hearing Association (ASHA). Of these, fewer than 400 are board-certified Fluency Specialists. These specialists are listed on the website

<http://www.stutteringspecialists.org/>

The Stuttering Foundation of America also lists speech-language pathologists. This webpage is

<http://www.stuttersfa.org/referral.htm>

You could also go to a National Stuttering Association local support group and ask for recommendations. Their website is

<http://www.nsastutter.org/>

Is Self-Therapy an Option?

You can't learn motor skills out of a book. You can learn the *cognitive* stage from a book or video. Analogously, many videotapes offer to teach golfers how to improve their swing.

But the *associative* stage requires *feedback*. A trained individual must observe you and tell you when your performance is correct, when your performance is incorrect, and what to change to correct your performance.

You can watch my videos demonstrating slow speech with stretched vowels, and lower vocal pitch with relaxed breathing and relaxed vocal folds, at <http://www.youtube.com/CasaFuturaTech>, or on my website (<http://www.casafutura.com>). If it helps you, great. If not, make an appointment at a speech clinic.

Slow Speech with Stretched Vowels

Let's start with how not to do slow speech with stretched vowels:

"I" < pause> "am" < pause> "an" < pause> "American."

Saying "I am an American" normally takes about 1.5 seconds (seven syllables at about five syllables per second). By silently pausing two seconds between words, and saying each word normally, the phrase would take about eight seconds. That wouldn't improve your fluency.

Instead, stretch each vowel for a second or two. Also stretch voiced consonants (e.g., /m/, /n/, /r/) a little longer than normal, but not as long as vowels. Articulate voiceless consonants (e.g., /k/) lightly and quickly, just touching your lips or tongue and then moving to the next voiced sound.

Join the syllables together, with no breaks or pauses between words. The result should sound like:

"IIIIIIIIaaaaammaaaaannAAAAmmeeeeerriiiiiikaaaaann"

Be sure that each syllable is held equally. In other words, "American" should take four times longer to say than "I." Don't make "American" the same length as "I."

Should you hold each syllable for one second or for two seconds? Some speech clinics start with one-second stretched syllables, when other speech clinics start with two seconds per syllable. No research has investigated which is more effective. If you're 100% fluent at one second per syllable, that should be slow

enough. But if you're not 100% fluent at one second per syllable, use two seconds per syllable. According to motor learning theory, you need to execute slow enough that your form is perfect, but there's no reason to execute slower. Use a stopwatch to check that each syllable is the same length. If you have a DAF device, set the delay to 200 milliseconds. Then hold each syllable until you hear yourself in the headphones. Check your stopwatch and you should see that each syllable is between one and two seconds.

Relaxed Breathing

Place one hand on your stomach. Breathe so that your hand moves out when you inhale, and in when you exhale.

Notice that you're taking many small breaths. Your inhale and exhale times are equal.

This is relaxed or *diaphragmatic* breathing. This is the way people normally breathe.

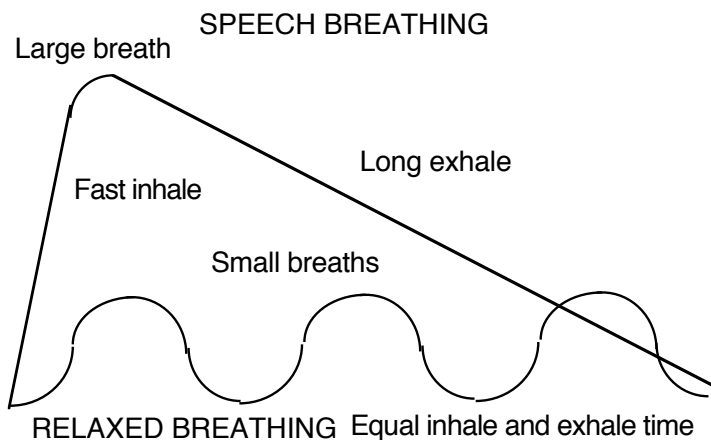


Figure 8: Thoracic vs. Diaphragmatic Breathing

Now switch to upper-chest breathing or *thoracic* breathing. Take a big breath, using your upper chest muscles to expand your lungs. Release the air slowly, while maintaining this upper chest muscle tension to hold air in your lungs as long as possible. When

you've released the air, quickly take another breath, filling your lungs as rapidly as possible. Practice switching between thoracic and diaphragmatic breathing.

Thoracic breathing increases our lung capacity. It enables us to maximize our physical exertion. Our "fight or flight" instinct switches us to thoracic breathing. We're then better able to run or fight.

Some individuals *hyperventilate* or switch to thoracic breathing when experiencing non-physical stress. Stress reduction classes teach students to relax by switching to diaphragmatic breathing.

We also use thoracic breathing when talking. A large breath with a long, slow exhale enable us to speak many words before pausing for another breath.

Well-meaning people who know nothing about stuttering may tell you to "take a deep breath" before talking. But the opposite is better advice. Diaphragmatic breathing is the foundation of many stuttering therapy programs. Taking smaller breaths with your diaphragm can help you relax and talk fluently.

Try it. Your relaxed breathing will relax your entire body. Most importantly, it will relax your vocal folds, and then your lips, jaw, and tongue. Your voice will deepen and sound confident and even "sexy." You'll feel relaxed and confident.

Practice a word list (page 204) using diaphragmatic breathing. Read a magazine page aloud using diaphragmatic breathing.

You'll soon discover a few problems trying to speak with diaphragmatic breathing. Each breath is small, so you're able to say only a few words on each breath. Inhale time and exhale time are equal, so you have long pauses between short phrases. You're unable to speak loudly.

Like other fluent speech motor skills, speaking with diaphragmatic breathing is abnormal but useful. Include speaking with diaphragmatic breathing in your stuttering therapy practice exercises. Mastering this skill will enable you to speak short phrases fluently in stressful situations. For example, a police officer pulls you over for speeding. You don't need to say much besides, "Yes,

officer,” and “No, officer.”

And as you master speaking with diaphragmatic breathing, you’ll develop something in-between thoracic and diaphragmatic breathing. This “in-between” breathing will be more relaxed than thoracic breathing, yet your phrase length and vocal volume will be within the normal range.

Phonation

Your vocal folds are flaps of muscle in your throat. Making your vocal folds vibrate produces sound. This sound then becomes your voice. Vocal fold vibration is called *phonation*.

Two conditions produce phonation. First, you release air from your lungs. Next, you tension or tighten your vocal folds.

Place your fingers on your throat. Exhale and hum. Your fingers should feel a vibration. This is your vocal folds vibrating.

Stop humming, and feel the vibration stop. Practice switching your phonation on and off.

Now vary your phonation in two ways. Change your volume (hum louder, then quieter). Change your pitch. Hum up and down a musical scale.

How did you do that? You varied your volume of exhalation, i.e., you increased or decreased the air releasing from your lungs by tensing or relaxing your thoracic (upper chest) muscles. More exhalation enabled you to produce more volume.

You also varied your vocal fold tension. Tense vocal folds produce a higher-pitched voice. Relaxed vocal folds produce a deeper or lower-pitched voice.

Tense your vocal folds as hard as you can. You’ll block your throat, not allowing any air to escape. If you take a deep breath and then block your throat, your increased lung pressure makes your chest stronger. Like inflating a tire to carry a heavier load, this is effective for lifting a heavy weight. But it’s not a good way to talk!

Practice one more aspect of phonation. Take a breath and hold it, tense your vocal folds, then release air. Switch to the other way:

take a breath, release a little air, then tense your vocal folds. Note that the former produced a croak. The latter produced a nice hum. This shows that phonation requires timing two muscle movements: exhaling a little air, and then starting to tense your vocal folds.

You now see that three things can go wrong with phonation:

1. Releasing too much or too little air (*inadequate breath support*).
2. Overtensing your vocal folds. Under stress, you may try too hard to talk, tense your vocal folds too much, and block off air flow. This results in a *silent block*.
3. Mistiming exhalation and vocal fold tension. A goal of stuttering therapy is train the stutterer to consciously breathe, release a little air, gently tense his vocal folds, and then begin to talk. This exercise is called *gentle onset* or *easy onset*.

Gentle Onsets with Vowels

To hit a baseball home run, you use all of your arm muscle strength. In contrast, to putt a golf ball a few feet, your arm muscles are more relaxed than tense. Phonation is like putting a golf ball, not hitting a home run.

To use *gentle onsets* (also called *easy onsets*), take a relaxed breath with your diaphragm. Release a little air. Say *ah* as you gradually increase vocal fold tension. Feel your vocal folds begin to vibrate. Increase your vocal fold tension, until you reach normal speaking volume. Gradually reduce vocal fold tension, until you're silent. Time this to take about two seconds. You should be able to do this on one breath, without reaching residual air.

You can buy computer applications that graph your phonation contour. Applications include Dr. Fluency, Speak:Gentle, and the Computer-Aided Fluency Establishment and Trainer (CAFET). Or you can use a sound-recording and -editing application (many such applications are available free). On a computer monitor, your vocal volume should look like this:

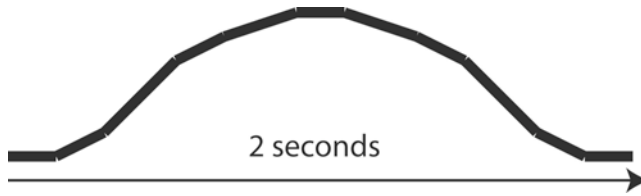


Figure 9: Gentle Onset Voice Contour

Practice fifteen gentle onsets with the fifteen vowel sounds (say the vowel, not the word):

- | | |
|-----------------|--|
| Front Vowels: | long <i>e</i> , as in <i>beet</i>
short <i>i</i> , as in <i>bit</i>
long <i>a</i> , as in <i>bait</i>
short <i>e</i> , as in <i>bet</i>
short <i>a</i> , as in <i>at</i> |
| Back Vowels: | long <i>u</i> , as in <i>boot</i>
short <i>o</i> , as in <i>book</i>
long <i>o</i> , as in <i>boat</i>
<i>aw</i> , as in <i>cause</i>
<i>ah</i> , as in <i>cot</i> |
| Central Vowels: | <i>ow</i> , as in <i>about</i>
short <i>u</i> , as in <i>but</i> |
| Diphthongs: | long <i>i</i> , as in <i>bite</i>
<i>oy</i> , as in <i>boy</i>
<i>au</i> , as in <i>bough</i> |

Gentle Onsets with Words

Now say “dog,” stretched over two seconds, with gentle onset. Begin with a quiet, gentle /d/ sound. Switch to the /aw/ vowel sound and gradually increase vocal volume. After one second,

gradually reduce vocal volume. Switch to the /g/ sound, and stop vocal fold vibration.

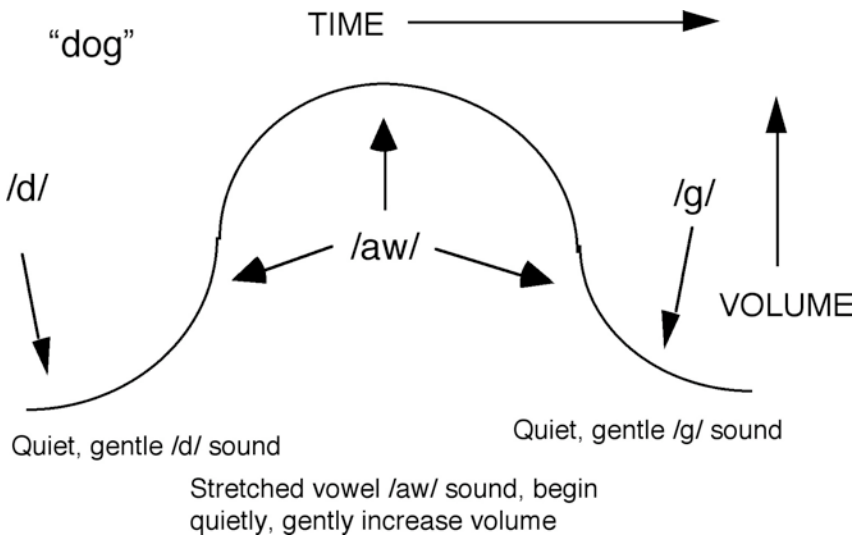


Figure 10: Gentle Onset with Words

Voice and Voiceless Consonants

All vowels use phonation. Some consonants use phonation, i.e., are *voiced*. Other consonants are produced without phonation, i.e., are *voiceless*. You can whisper these consonants.

Place your fingers on your throat. Say *ah* to feel your vocal folds vibrating. Say the following words and decide whether the initial consonant is voice or voiceless:

/h/	hail	/w/	whale
/f/	famous	/v/	vacant
/s/	saber	/z/	zany
/sh/	chenille	/zh/	jeté (a ballet move)
/ch/	chive	/j/	jive
/thr/	throw	/th/	those
/p/	pipeline	/b/	bison
/t/	tie-dye	/d/	diner

/k/	kindness	/g/	guide
-----	----------	-----	-------

The first column was voiceless. The second column was voiced.

Did you notice that these sounds were pairs? /h/ and /w/ have your lips, jaw, and tongue in the same positions. The difference is that your vocal folds vibrate to produce /w/, but don't vibrate to produce /h/.

To say a word with a voiceless consonant, take a breath, let out a little air, shape the consonant with your lips, jaw, and tongue, then switch to the vowel and gently start your vocal fold vibration.

Practice a word list (page 204). Keep your fingers on your throat to feel your vocal folds switching on and off as you go from voiced to voiceless sounds. Stretch each word to two seconds.

Because most words contain both voiced and voiceless sounds, we switch our vocal folds on and off many times each second while talking. A core behavior of stuttering is an inability to switch phonation on at the right moments. The timing can be as precise as one one-hundredth (1/100) of a second.

Normal speech is about five syllables per second, or 0.2 seconds per syllable. For this practice you're using two seconds per syllable stretched speech, or ten times slower than a normal speaking rate. Slowing down your speech helps you develop awareness and control of speech elements that are otherwise too fast to notice or control. If you play a sport, such as tennis or golf, your coach might videotape your swing and then replay it back in slow motion. This improves your awareness and control of the motor skill.

Continuous Phonation

Stuttering therapy sometimes teaches techniques that produce fluency, but sound abnormal. For example, speech with diaphragmatic breathing produces fluency, but shortens phrase length and makes you pause between phrases. The immediate goal is to use these techniques to produce fluent speech, and over time reduce the degree of exaggeration, until your speech sounds normal. Another goal is have a "trick" to use in stressful situations, such as

speaking to a police officer.

Continuous phonation is such a technique or trick. Recall that consonants come in voiced/voiceless pairs. Simply substitute a voiced consonant whenever you need to say a voiceless consonant.

For example, “Patty” becomes “Baddy.” Say each word slowly, with your fingers on your throat to feel your phonation. You’ll feel your vocal folds switch on and off for “Patty,” but stay on for “Baddy.”

If you shorten the consonants and stretch your vowels (producing a slower speaking rate), listeners won’t hear the difference between “Patty” and “Baddy.”

Gentle Onsets with Multisyllabic Words

Practice using a gentle onset on each syllable. Go loud on each vowel. On the consonants, relax, go quiet, and lightly and quickly articulate the sounds.

For example, on “American,” you start with a gentle onset on the initial /uh/. Open your mouth wide at the loudest point in the phonation contour.

Take the /uh/ sound down in volume, while at the same time closing your mouth to articulate the voiced /m/. Bring the /eh/ sound up in volume. Again, open your mouth wide at the loudest point in the phonation contour.

Take the /eh/ sound down in volume, while at the same time reduce your jaw opening (but don’t close your lips) to articulate the voiced /r/.

Open your mouth wide again for the /ih/ vowel on the third syllable.

Now you get to the only voiceless sound in “American.” Before the /k/ sound, take the down the volume of the /ih/ vowel. Whisper the /k/. If you block, you dropped the /ih/ volume too fast. Try again with a long, slow decline in volume on the /ih/. Articulate the /k/ lightly, for just a moment.

If you still block on the /k/, change it to a voiced /g/. In other words, say “Amerigan.”

Use another gentle onset on the final /eh/ vowel. Reduce your volume on the final voiced /n/ consonant.

The result is an abnormal-sounding “sing-song” speech pattern. Your jaw opens and closes noticeably on each syllable. While you won’t want to talk like this for the rest of your life, for practice or in stressful situations this technique helps you use gentle onsets, continuous phonation, and a slower speaking rate.

Articulation

The third set of speech muscles (after respiration and phonation) are your articulators: lips, jaw, and tongue. These muscles form your vocal fold humming into sounds and words. If you phonate without moving your lips, jaw, and tongue, all that comes out of your mouth is humming. The goal of this last target is to relax these muscles.

Reduced articulatory pressure is also called “soft targets.”

Lightly touch your tongue for the /t/. Lightly close your lips for the /b/. Keep your speech production muscles relaxed for all sounds.

The wrong way is to tense your lips and tongue and jaw too much, and hold this tension too long.

You’ve learned to stretch and emphasize vowels. Now work on de-emphasizing consonants. If you stretch and emphasize vowels, and de-emphasize consonants, you should be able to speak fluently.

Read another word list (page 204) aloud. Feel how your lips, jaw, and tongue move to change sounds. Say each word with normal articulation tension. Then say the word again with tense articulation. Then say the word again with relaxed articulation.

Some stuttering therapy programs at this point devote many hours to teaching the stutterer the correct lips, jaw, and tongue position for each of the 40+ sounds of English. This is unnecessary, in my opinion. Stuttering is not an articulation disorder. Stutterers don’t, in general, misarticulate sounds (e.g., saying /w/ instead of

/v/). Stutterers instead need to learn to relax their lips, jaws, and tongues.

There are exceptions. If your speech-language pathologist diagnoses that you have articulation problems, or if you speak with a foreign accent, do articulation therapy to train you to place your lips, jaw, and tongue in the correct positions.

Biofeedback

The associative stage of motor learning requires feedback. In sports this is called *knowledge of results*. For example, in golf or tennis you see where the ball goes after you hit it. Playing golf or tennis on a dark, foggy night would be difficult.

Feedback quality is affected by *speed*. If you hit ten golf balls on a dark, foggy night, then the next day find one of the balls 150 yards away, you'll have no memory of what you did right to hit it so far.

Feedback quality is also affected by *accuracy*. If you and your buddy each hit a golf ball, and one ball goes 150 yards but you don't know whose ball it was, you have inaccurate feedback.

Or the observer gets bored. If you hit golf balls for hours, and have a person telling you how far the balls go, sooner or later the person will stop paying attention.

Which Fluency Skills Need Feedback?

When you're learning fluent speech motor skills, you need knowledge of results. Some skills are easy to observe. For example, resting your hand on your stomach tells you whether you're using diaphragmatic (relaxed) breathing or thoracic (speech) breathing.

Your articulators (lips, jaw, and tongue) are a little harder to be aware of, as you can't see them. But you have good proprioceptive awareness of these muscles, so developing awareness and control isn't hard.

Your vocal folds are another story. These muscles are deep in your throat. You can't touch them or see them. Most people don't

even know they have vocal folds.

The most difficult feedback is with the timing of all this. For example, your speech-language pathologist tells you to exhale a little air and then increase your vocal fold tension. You do this slowly and correctly. Then she tells you to increase the speed. You must execute these movements within hundredths of a second. You can't tell whether you're doing it right, and most speech-language pathologists can't either. A fluency specialist who's helped hundreds of stutterers has better-trained ear and visual skills and gives better quality of feedback than a speech-language pathologist who's never treated a stutterer.

Biofeedback Devices

In 1974, Charles Van Riper predicted what a future historian would say about the next hundred years of stuttering treatments:

Our scrutiny of two old books on the nature and treatment of stuttering* that were published in the early 1970s reveals a vast collection of misinformation, ignorance, and benightedness. Preventative and remedial practices were characterized by a primitiveness and crudity that now seem appalling. The lot of the stutterer at that time must have been a very sad one. Nevertheless, in the last two decades of the twentieth century, we do find some progress in solving the problems of this ancient affliction.¹⁷⁸

Van Riper then predicted the organization of stuttering self-help groups, a scientific journal devoted to research about stuttering, and the certification of speech-language pathologists specializing in stuttering. All of these have happened. He then predicted that a stutterer would invent

* Van Riper's two books were *The Nature of Stuttering* (1971) and *The Treatment of Stuttering* (1973).

a biofeedback computer system that provided a backflow of error information from sensors that monitored [breathing, speech motor tension, and articulation errors and then] stimulated the pain centers when error signals appeared or alternatively stimulated the pleasure centers when the stutterer did not make these errors but instead spoke fluently.

[The biofeedback computer system] was able to make...adult stutterers completely fluent after just a few hours [in the speech clinic, and use of a portable device produced carryover fluency and the subjects were able to stop using the device] after only a month of intensive therapy. Despite his success, we note [that the inventor] found it very difficult to convince the stuttering specialists of his time that his invention was truly effective.¹⁷⁹

Biofeedback is the measurement and display (to the user) of a physiological activity, to enable the user to improve awareness and control of the activity. Biofeedback machines:

- Provide faster, more precise, and more reliable feedback than a human observer.
- Provide real-time feedback, beeping the instant you make a mistake.
- Provide accuracy measuring things humans can't see or hear.
- Never get bored, even after hours of practice.
- Free the speech-language pathologist to spend more time on psychological aspects of stuttering.
- Are effective for persons who learn visually rather than aurally.
- Are designed for home practice use as well as clinical use.

But you still need a speech-language pathologist to train you to do the target motor skills (cognitive stage). The machines can only help you to refine your skills (associative stage).

CAFET and Dr. Fluency

The Computer-Aided Fluency Establishment and Trainer

(CAFET) and Dr. Fluency are computer-based biofeedback systems. Both use a microphone to monitor vocal volume, as a surrogate for vocal fold activity, and a chest strap to monitor breathing.

You see your breathing and vocal volume displayed on the computer screen, along with instructions or error messages. The two computer systems train similar speech motor skills:

1. Relaxed, diaphragmatic breathing.
2. Continuous breathing. The computer alerts you if you hold your breath more than 1/3 of a second.
3. Gradual exhalation, as opposed to the rapid, uncontrolled exhalation associated with stuttering.
4. Pre-voice exhalation, or letting a little air out before you begin tensing your vocal folds.
5. Gentle onset, or gradually increasing vocal volume. The computer alerts you if your vocal volume changes too rapidly. The computer also alerts you if your voice is too quiet for your air flow (which sounds breathy).
6. Continuous phonation. Breaks in vocal volume are shown on the computer monitor.
7. Adequate breath support. The computer alerts you if you continue to talk after the point at which you should take another breath.
8. Phrasing. Each of the above seven speech targets is taught first with vowels, then progressing to monosyllabic words, then to marked-length phrases.

An unpublished study of the CAFET program with 197 adults and teenagers reported that 82% met fluency criteria six months after completing the program; 89% were fluent after twelve months; and 92% were fluent two years post-therapy.

EMG and Vocal Frequency Biofeedback

In 1994 I added electromyographic (EMG) biofeedback to my

company's DAF/FAF devices. I taped electrodes to my throat and jaw. When I tensed my speech-production muscles a row of yellow and red lights lit, and the DAF/FAF sound switched on. When I relaxed my speech-production muscles, a row of green lights lit, and the sound switched off.

I went to a speech-language pathology convention and demonstrated the device eight hours a day for three and a half days to hundreds of speech-language pathologists. After the convention I couldn't stutter for a week. Eventually my stuttering returned, but not as severely. If I used the biofeedback device every day on telephone calls, I was fluent the rest of the day. This was my biggest breakthrough in fluency.

The not-so-secret to my success was that I was talking all day, every day, using target speech behaviors in every conversation. The EMG biofeedback device helped me stay on target.

EMG was expensive and cumbersome. I noticed that when the green lights were on (indicating relaxed speech-production muscles) my vocal pitch was lower. I built a biofeedback device that measured my vocal frequency. This worked better than the EMG biofeedback, and was simpler and less expensive. I called this *vocal tension biofeedback* and included it in my company's Desktop Fluency System and Pocket Speech Lab.

Efficacy Studies of Fluency Shaping Programs

A rigorous study followed 42 stutterers through the three-week program at the Institute for Stuttering Therapy and Treatment (ISTAR) in Edmonton, Alberta, Canada.¹⁸⁰ The fluency shaping program was based on slow, prolonged speech, starting with 1.5-seconds-per-syllable stretch, and ending with slow-normal speech. The program also works on reducing fears and avoidances, discussing stuttering openly, and changing social habits to increase speaking. The program includes a maintenance program for practicing at home. The program reduced stuttering from about 15-20% stuttered syllables to 1-2% stuttered syllables. Twelve to 24

months after therapy, about 70% of the stutterers had satisfactory fluency. About 5% were marginally successful. About 25% had unsatisfactory fluency.

A more recent study of the ISTAR program found that improved results, with 71-86% of graduates retaining fluency two years post-treatment.¹⁸¹

A study of Precision Fluency Shaping (a.k.a. Hollins therapy) found that a three-week intensive program followed by one year of follow-ups reduced stuttering from 7.1% to 1.6%. A year later the average stuttering was 3.6% (a 50% reduction in stuttering).¹⁸²

The section “SLPs vs. Parents vs. Computers,” (page 46) describes a large study of fluency shaping therapy with EMG biofeedback.¹⁸³

After completion of another “smooth speech” fluency shaping stuttering therapy program, about 95% of subjects were “very satisfied” or “satisfied” with their speech at the end of the treatment. A year later, their satisfaction dropped to 43%.¹⁸⁴

Another study reported that 100% of subjects who completed a year-long “prolonged speech” fluency shaping stuttering therapy program were able to speak nearly fluently. But two-thirds of the stutterers who started the program didn’t complete it.¹⁸⁵



Beyond Fluency Shaping

Advances in the field of motor learning and control could make fluency shaping therapy more effective.

Improving Cognitive Stage Speech Motor Learning

In the first or *cognitive* stage of motor learning, you observe an instructor performing a motor skill that's new to you. But speech-language pathologists may be the wrong people to model fluent speech motor skills. When learning a new motor skill, novices learn best by observing another novice making mistakes, then getting it right.

In contrast, observing a skilled person perform the task flawlessly doesn't do you much good. For example, millions of people watch Michael Jordan play basketball. Few of those people could go out on a basketball court and repeat his moves. The exceptions are people who are already skilled and want to get better, e.g., college basketball players can improve their game by watching the pros.

A stutterer watching a speech-language pathologist model gentle onsets or pull-outs is like Joe Sixpack watching Michael Jordan. The stutterer might learn more if the speech-language pathologist modeled the mistakes her other clients have made, and then showed how to correct those mistakes. Or the speech-language pathologist could prepare a video of her previous clients making mistakes, and then learning to correct their mistakes.

Improving Associative Stage Speech Motor Learning

In the second or *associative* stage of motor learning, you learn to perform and refine a new motor skill. But are there better fluent speech motor skills than the skills taught in fluency shaping stuttering therapy programs?

Lower Vocal Pitch

Speaking at a lower vocal pitch requires relaxing one's vocal folds, and reduces stuttering.¹⁸⁶ Unlike other fluency-enhancing techniques such as a slow speaking rate or gentle onsets, listeners like the sound of a lower vocal pitch. A lower vocal pitch communicates confidence and relaxed authority. Some listeners even say that a lower vocal pitch sounds “sexy.” Speaking with a lower vocal pitch makes one feel relaxed and confident. Yet this technique is not a target behavior in fluency shaping stuttering therapy programs.

According to multichannel processing theory, performing two tasks is easier if you integrate the tasks. For example, dancing while playing the saxophone is easier than playing tennis while playing the sax. Using fluency shaping motor skills while paying attention to a conversation should be easier if the motor skills relate to the conversation. If you're trying to communicate that you're relaxed and confident, then using a “slow normal” speaking rate with a lower vocal pitch should be easier than using gentle onsets.

This technique can be trained by using relaxed, diaphragmatic breathing while feeling (with your fingers or your throat) and/or listening to your vocal fold vibrations. Begin by humming or saying “ahhhh.” Bring the pitch up, then down, then up again, then down further. Repeat until you feel and hear yourself humming at a very low pitch. Now speak slowly, stretching vowels, while keeping your vocal pitch low.

Notice that your vocal volume drops as you lower your vocal pitch. Don't try to speak loudly with a low vocal pitch, you may damage your vocal folds. A lower vocal volume is usually acceptable unless you're speaking in a noisy environment or to a person

with hearing loss.

Frequency-shifted auditory feedback (FAF) induces a lower vocal pitch in non-stutterers.¹⁸⁷ One study tested whether a half-octave FAF downshift changes stutterers' vocal pitch. The results were negative,¹⁸⁸ but I believe that a greater frequency shift, combined with the headphones we use today, would have positive results. In other words, if you have an FAF device, set it for one-half or one octave down, and use the best-quality headphones you have. Then say "ahhhh" or speak slowly with stretched vowels, trying to slow your vocal fold vibrations to match the frequency you hear in the headphones.

Lower vocal pitch may be difficult for women speech-language pathologists to model, or for children or women stutterers to use (Lauren Bacall might contradict that statement!). Adult men are more capable of lowering their vocal pitch. Listen to an audio book read by a male actor and then listen to another audio book read by a female actor: you'll likely hear that the male actor can perform a wider variety and range of character voices.

Automatic, Effortless Fluency

The third or *autonomous* stage of motor learning moves you from closed-loop motor control to open-loop motor control. In stuttering therapy, the autonomous stage makes fluent speech automatic and effortless.

Autonomous stage motor learning results from:

1. Practicing target muscle movements *faster* and *harder*,
2. While making *no errors*,
3. In *stressful* situations,
4. With an ideal *practice schedule*,
5. For about three million *repetitions*.

For example, you take tennis lessons. Your coach shows you how to grip the racket properly, and swing at the ball. At first you

execute this movement slowly, with little force. As your skill improves, you swing faster, and hit the ball harder. Whenever you make a mistake, your coach stops you and makes you begin again, slowly. At first your coach hits you easy balls. Then he hits harder balls to you, making the game stressful. Then you play tennis regularly. Over several years your game improves.

Where Stuttering Therapy Fails

Most stuttering therapy programs do little to train autonomous motor learning:

1. Your speech-language pathologist tells you to make a conscious effort to speak fluently. You're told that if your fluency fails, it's your fault for not concentrating on your speech.
2. All practice is done with relaxed speech-production muscles. You never increase muscle tension.
3. All practice is done at slow speaking rates.
4. All practice is done in the speech clinic, or at home alone. You don't do practice in high-stress situations.

Increasing Force and Speed

Stuttering therapy programs fail to train the autonomous stage of speech motor learning because of a counterintuitive aspect of stuttering. Stuttering is characterized by excessive speech-production muscle activity. The obvious but wrong treatment for stuttering is to reduce speech-production muscle activity, i.e., to speak with relaxed breathing, vocal folds, and articulation muscles.

As noted earlier (page 90), speech-language pathologists see that slowing down and using closed-loop speech motor control eliminates stuttering. They reach the obvious but wrong conclusion that stuttering therapy should be done at slow speaking rates.

Fluency shaping therapy begins by training slow, relaxed, fluent speech motor skills. Similarly, golf and tennis instruction begins with slow, relaxed, correct movements. Golf and tennis instructors

then have you increase your force and speed. In contrast, speech-language pathologists tell you not to increase your force and speed. It may seem counterintuitive, but after you master slow, relaxed fluent speech, you must increase both the speed and force of your speech, without making errors, to train automatic, effortless fluency.

Increasing Force

The force of your speech is measured by volume. Work on getting loud. But don't shout or yell. Instead, *project* your voice. Vocal volume is a factor of both exhalation volume and vocal fold tension. Increase your exhalation volume while keeping your vocal folds relatively relaxed. This result is high volume with the intonations of normal conversational speech. Stage actors do this.

Increase your onset speed while maintaining long syllable duration. Pretend that your forearm is a sports car's accelerator. When your fist is up, your vocal volume is quiet. As you push your fist down, your volume increases. When your fist is all the way down, you're at maximum volume. Listeners one hundred feet away should hear you.

Slowly lower your fist to produce a gentle onset. Then slam your fist down fast to go from silence to maximum volume. Then hold that volume while stretching the vowel. Pull your fist up fast to end the word with speed. This is slow speech with maximum effort.

Be careful not to damage your vocal folds. Stop if you feel hoarse or start to lose your voice.

Increasing Speed

Shorten syllable duration from two seconds, to one second, to one-half second, to one-quarter second. Practice this both with relaxed, quiet speech, and with loud, forceful speech.

Using the practice word lists (page 204) say each word four times:

1. Slow and relaxed (quietly).

2. Slow and projecting your voice (loudly).
3. Relaxed (quietly) with a quick onset.
4. Loudly projecting the word with a hard onset.

Where to Practice Force and Speed

It's hard to practice loud speech in a small room. The ideal place to practice is an empty auditorium. Have your speech-language pathologist sit in the back row. Stand on stage and project your voice to her. She yells, "Can't hear you!" until you reach ideal volume.

Another place to practice is near a building that produces an echo. A third place to practice is on a freeway overpass. Demosthenes, the stutterer who became the greatest orator of ancient Greece, projected his voice over breaking waves at the seashore. Work on projecting your voice over the waves of traffic.

Reinforcing On-Target Speech

Increasing speed and force *myelinates* or reinforces neural pathways in your brain. A mistake reinforces the wrong neural pathways.

Learning to talk fluently requires talking fluently 100% of the time. That sounds like circular advice, and it is. Reinforcing motor skills is a "virtuous cycle." Using target skills reinforces the skills, making the skills easier to use.

Conversely, stuttering reinforces undesirable speech motor skills (core behaviors, page 18) and bad communication habits (secondary behaviors, page 19). Stuttering sets up a "vicious cycle" instead of a "virtuous cycle."

Swimming Analogy

I wanted to improve my swimming. At first I could swim only one length of the pool, and then I had to rest. But I got in the pool three times a week. I found that a small flotation device helped me swim five or ten laps. After two months something "clicked" in my brain

and I swam half a mile. It was easy, almost effortless. I didn't need the flotation device any more.

Then I moved to a building without a swimming pool, stopped swimming, and now I swim as poorly as I did before that summer.

Similarly, stutterers go to speech therapy three times a week for months. Then suddenly one day they find themselves talking fluently, without effort. If they discontinue speech therapy, this "lucky" fluency disappears and they go back to stuttering.

Stutterers' brains have two sets of speech motor programs (see the chapter "Responding to Stress," page 129). Sometimes our brains pick the fluent speech motor programs. At other times our brains pick the stuttering speech motor programs. Speech therapy reinforces the fluent speech motor programs. Eventually this fluent speech becomes habitual. But during "lucky" fluency this habit is precariously balanced. One stressful day, in which you allow yourself to stutter, can reinforce the stuttering motor programs, and your "lucky" fluency is gone.

Speech Buddies

Children learn grammar by listening to other people talking, then speaking, then having their parents correct their grammar. You may not remember this, but after a vacation to the seashore you said, "We went nearly to the beach every day," and your mother corrected you, "No, dear, we went to the beach nearly every day."

Your mom was your speech buddy. You need another speech buddy now, to help you correct your speech when you're disfluent.

Ask your speech-language pathologist to let you organize a practice group with her other clients. Meet once a week to practice fluent speech. Exchange telephone numbers and arrange to call a speech buddy every day.

Here's an idea that'll get you talking fluently. If you have a spare bedroom in your house, call your local university and offer to let a speech-language pathology student live rent-free, in return for reminding you to use fluency shaping skills. If you don't live near a university, call your school district and see if they have a speech-

language pathologist who'd go for free rent.

Train your spouse, housemates, and the people you work with to remind you to use fluency skills. If you're a parent with a child in speech therapy, ask your child's speech-language pathologist to train you to correct your child at home (see "SLPs vs. Parents vs. Computers," (page 46).

Bring your spouse or housemates to speech therapy. Ask them to give you a warning sign when you don't use your fluency targets, and offer to pay them \$1 whenever you stutter.

My Romantic Disaster of 1996

In eighth grade I had a teacher with a forceful personality and a large ego. He decided to cure my stuttering. Whenever I stuttered he stopped me, then told me to say it without stuttering. I hadn't had speech therapy and had no idea what to do. His method was as effective as teaching me Chinese by stopping me from speaking English and telling me to speak in Chinese.

Twenty years later I'd completed several speech therapy programs. I'd used electronic anti-stuttering devices for several years. I dated a woman who disliked my stuttering. Whenever I started to block, she'd give me a certain look. I'd stop, relax my breathing and vocal folds, and speak fluently.

After a few days with her I was talking fluently all the time. The relationship crashed and burned shortly after that.

For an individual who hasn't completed a speech therapy program, a person pointing out his stuttering is the worst thing. Such an individual doesn't have any control over his speech. Telling him to talk fluently increases his stress and his stuttering.

But for an individual who has mastered fluent speech skills, pointing out his disfluencies and reminding him to use fluent speech skills will help him. When you're at that stage, find someone to do this for you. (See the section "Modeling," page 41.)

Start a Virtuous Cycle

Do whatever you need to get into the virtuous cycle. You may have

to do things that are difficult or embarrassing—e.g., telling your co-workers that you stutter (hint: they’ve probably already figured that out!).

Once you’re in a virtuous cycle, fluent speech will become easier and easier with less and less effort. The difficult things will become easier, and the embarrassing things won’t be embarrassing (or necessary). If you’ve done it right, you’ll only have to do these things for a few days or weeks.

Getting into a virtuous cycle may require:

1. Using closed-loop speech motor control (slow speech).
2. Using an electronic anti-stuttering device.
3. Taking a dopamine-antagonist medication.
4. Talking in uncomfortable situations, e.g., to strangers or to telemarketers.

For a high-testosterone kickstart, see “The *Predator* Approach” (page 140).

Practicing Under Stress

Autonomous motor learning requires practicing a new motor skill in stressful situations.

Design a hierarchy of stressful situations. The first might be leaving a message on your speech-language pathologist’s answering machine. When you can do that comfortably and fluently, you might talk to telemarketers using closed-loop speech motor control (slow, fluent speech). Then you could join Toastmasters and make a series of speeches to your club. More about this in the chapter “Responding to Stress” (page 129).

Practice Scheduling

The United States Postal Service studied workers learning to operate mail-sorting machines (similar to typewriters). All subjects received 60 hours of training. The scheduling varied among four groups.

One group had two two-hour sessions per day, for 15 days. A second group had one two-hour session per day, for 30 days. A third group had two one-hour sessions per day, for 30 days. The fourth group had one one-hour session per day, for 60 days.

The first group (two two-hour sessions per day) learned fastest, but in the long run had the worst performance. The fourth group (one one-hour session per day) took the longest to get “up to speed,” but eventually had the best performance.

Surprisingly, the postal workers preferred the two-hour/two-session schedule, even though they had the worst performance. People are impatient. They don’t want to spend 60 days learning something, if they think there’s a 15-day shortcut.

Extinguishing Old Skills

We could simplistically conclude that you should practice stuttering therapy no more than one hour per day. But there’s an essential difference between speech therapy and mail sorting. The postal workers were learning a new motor skill. Stutterers have to learn a new motor skill and extinguish an old motor skill. As noted earlier, coaches often prefer to work with individuals who have never played a sport and haven’t learned bad habits, rather than work with experienced athletes and have to break their bad habits.

To extinguish an old motor skill you must stop doing it. Perhaps the ideal stuttering therapy is done one hour per day, and then you take a vow of silence the rest of the day. But that’s unrealistic. To burn new fluent neural pathways, and extinguish old stuttering neural pathways, you must use fluent speech every time you talk. You must never stutter. Each disfluency weakens your new fluent neural pathways and strengthens your old stuttering neural pathways.

Extinguishing a maladaptive motor skill isn’t the same as “breaking” a bad habit. Maladaptive motor skills enable you to perform a desirable behavior, but not as well as a better motor skill. For example, touchtyping is better than two-fingered typing, but two-fingered typing also gets the job done. In contrast, picking

my nose is an undesirable behavior. I wish that a teacher had taught me to touchtype when I was a child. I don't wish that a teacher had taught me a better way to pick my nose.

Because maladaptive motor skills enable you to perform a desirable behavior, it's hard to unlearn them and replace them with optimal motor skills. Stuttering isn't like picking your nose. Your mother could slap your hand and stop you whenever you pick your nose. If she stopped you every time you stuttered, you wouldn't be able to talk.

Extinguishing a maladaptive motor skill may involve "one step forward, one step back" temporarily. To speak fluently, you may have to speak much slower, or not respond immediately while you focus on your speech motor skills.

Intensive Residential Speech Therapy Programs

Some stutterers go to intensive residential speech therapy programs. These programs typically last three weeks. You're surrounded by speech-language pathologists and other stutterers, and isolated from the real world. For the first two weeks, you use two-second stretch all the time. In the third week, you move to one-second stretch, then half-second, and finally quarter-second slow normal.

Intensive residential speech therapy programs are like the postal workers who did the "short cut" training. In three weeks of intensive therapy you learn to talk fluently. But many stutterers find that long-term results are disappointing.

Your Ideal Practice Schedule

Work with your speech-language pathologist to develop a practice schedule. A severe stutterer may have to spend many hours a day doing "homework."

Don't practice sitting alone in a room reading endless word lists. This isn't going to produce carryover fluency to stressful situations.

A one-hour daily practice could have the following elements:

- After breakfast, twenty minutes of high intensity practice (projection and hard onsets), with practice word lists (page 204).
- During the day, a stressful twenty-minute session while using a biofeedback device to keep your vocal folds relaxed. This could be calling strangers for your job.
- After supper, twenty minutes of very slow closed-loop speech motor control conversation. Call another stutterer in your support group. Or call infomercial toll-free numbers.

How Long Does Autonomous Learning Take?

Gymnasts practice daily for about eight years to become proficient.

Motor learning researchers studied the manual (hand) skills of cigar-makers.¹⁸⁹ Beginner cigar-makers worked three times slower than experienced cigar-makers. Becoming fully skilled required making three million cigars.

Three million repetitions were also needed for Japanese pearl handlers to become proficient. The Suzuki method of teaching violin to children requires the production of about 2.5 million notes. Basketball, football, and baseball throws require about a million practice throws.

This suggests that making fluent speech automatic and effortless requires saying about three million syllables. At five syllables per second, talking four hours a day (just your time talking, not combined talking and listening), you could produce three million syllables in six weeks.

If you got a job answering telephone calls, and you did your stuttering therapy skills on every call, and you connected a biofeedback device into your telephone to alert you when you missed a therapy target, and you spent your free time at Toastmasters clubs making speeches or volunteering at a hospital's information desk, fluent speech might become automatic for you in six weeks.

But most stutterers practice between ten minutes and one hour per day. If they were silent the rest of the day, they'd say three million syllables somewhere between six months and three years.

No one has studied whether using undesirable motor skills cancels out on-target practice. In other words, does a half-hour of on-target practice get cancelled out by not using fluency skills the rest of the day? Such a practice schedule might take years to produce automatic fluent speech—or might never work.

Zen in the Art of Stuttering

Zen is the “everyday mind,” as was proclaimed by Baso (died 788); this “everyday mind” is no more than “sleeping when tired, eating when hungry.” As soon as we reflect, deliberate, and conceptualize, the original unconsciousness is lost and a thought interferes. We no longer eat while eating, we no longer sleep while sleeping. The arrow is off the string but does not fly straight to the target...Calculation which is miscalculation sets in...The archer’s confused mind betrays itself in every direction and every field of activity.

— Daisetz T. Suzuki, intro to *Zen in the Art of Archery*

Stuttering is what you do trying not to stutter again.

— Wendell Johnson

The goal of stuttering therapy is spontaneous fluent speech. The goal of Zen is to do life activities without self-conscious calculating and thinking.

Non-stutterers usually talk without self-conscious calculating and thinking. But sometimes they are self-conscious about their speech. Fear of public speaking is common. And non-stutterers are self-conscious about asking the boss for a raise, or asking someone out on a date, or when discussing an embarrassing subject. Speech-language pathologists call this *pragmatics*—the mental effort of calculating the listener’s reaction to your speech. In the Zen framework, pragmatics is the calculation that is miscalculation.

A goal of stuttering therapy could be to become a “Zen master of speech,” just as other Zen masters are archers or swordsmen or

calligraphers. To make an analogy to Baso, you sleep when tired, eat when hungry, and talk when you need to communicate. You don't worry about the listener's reaction. You don't fear embarrassment. If the listener doesn't do what you want or expect, you don't get upset.

You also talk fluently—but let's define fluency as if we're learning a foreign language. You need vocabulary to express your thoughts, grammar so your meaning isn't misconstrued, and accent and articulation to be understood. Mild stuttering may be OK, if your listener understands you, and you don't fear or avoid speaking. Van Riper called this "fluent stuttering," and a Zen master might call it "fluency which is not fluency."

Eugen Herrigel and Awa Kenzo

Eugen Herrigel (1884–1955) was a German professor of philosophy, with a special interest in mysticism. From 1924 to 1929 he taught philosophy in Japan, and studied archery with an eccentric archery instructor named Awa Kenzo. Awa taught archery as a mystical religion, called *Daishadokyo*. *Daishadokyo* had nothing to do with Zen Buddhism or the traditional Japanese art of archery (*kyudo* or *kyujutsu*).¹⁹⁰ In 1936, Herrigel wrote a 20-page essay about his experiences, and then in 1948 expanded the essay into a short book entitled *Zen in the Art of Archery*. Regardless of whether it accurately portrays Zen Buddhism or traditional Japanese archery, the book has many accurate insights into motor learning and control. For example, a central theme of the book is that a complex and difficult motor skill becomes seemingly mentally and physically effortless after years of practice, and that the motor skill is best performed when your body seems to execute the motor skill without your mind's conscious control. The book is wonderfully written and has been a bestseller for more than fifty years, in many languages.

Master Awa's first lesson was drawing the bow, letting "only your two hands do the work, while your arm and shoulder muscles remain relaxed, as though they looked on impassively."

This step is like stuttering therapy, with the goal of speaking while keeping your speech-production muscles relaxed.

Herrigel couldn't do this first step. He wrote that he'd "start trembling after a few moments, and my breathing became more and more labored." Sounds like stuttering!

He was trying to draw a six-foot bow held above his head, which requires great strength. But somehow the Master did this effortlessly.

...he called out to me to "Relax! Relax!"...the day came when...I lost patience and brought myself to admit that I absolutely could not draw the bow in the manner prescribed.

"You cannot do it," explained the Master, "because you do not breathe right."

Sounds like stuttering therapy! The Master continued,

"Press your breath down gently after breathing in, so that the abdominal wall is tightly stretched, and hold it there for a while. Then breathe out as slowly and evenly as possible, and after a short pause, draw a quick breath of air again—out and in continually, in a rhythm, that will gradually settle itself. If it is done properly, you will feel the shooting becoming easier every day. For through this breathing you will not only discover the source of all spiritual strength but will also cause this source to flow more abundantly, and to pour more easily through your limbs the more relaxed you are."

And as if to prove it, he drew his strong bow and invited me to step behind him and feel his arm muscles. They were indeed quite relaxed, as though they were doing no work at all.

The new way of breathing was practiced, without bow and arrow at first, until it came naturally. The slight feeling of discomfort noticeable in the beginning was quickly overcome. The Master attached so much importance to breathing out as slowly and steadily as possible

to the very end, that, for better practice and control, he made us combine it with a humming note.

First relaxed breathing, and now vocal fold vibration!

I cannot think back to those days without recalling, over and over again, how difficult I found it, in the beginning, to get my breathing to work out right...

When, to excuse myself, I once remarked that I was conscientiously making an effort to keep relaxed, he replied: "That's just the trouble, you make an effort to think about it. Concentrate entirely on your breathing, as if you had nothing else to do!"

I've heard speech-language pathologists say the same thing...

It took me considerable time before I succeeded in doing what the Master wanted. But—I succeeded. I learned to lose myself so effortlessly in the breathing that I sometimes had the feeling that I myself was not breathing but—strange as this may sound—being breathed. And even when, in hours of thoughtful reflection, I struggled against this bold idea, I could no longer doubt that the breathing held out all that the Master had promised.

Learning to draw the bow took a year. Perhaps stuttering therapies are unsuccessful because we expect results too quickly. Imagine stuttering therapy starting with a year of breathing exercises!

Then Herrigel learned to loose the arrow. This was even more difficult than drawing the bow. Herrigel kept jerking his hand at the moment of release, which resulted in "visible shaking of my whole body and affected the bow and arrow as well." This caused the arrow to "wobble."

The Master told Herrigel, "Don't think of what you have to do, don't consider how to carry it out! You mustn't open the right hand on purpose."

Herrigel told the Master that after drawing the bow, "unless the

shot comes at once I shan't be able to endure the tension...I can't wait any longer."

The Master replied that Herrigel's inability to wait was because, "You do not wait for fulfillment, but brace yourself for failure."

Herrigel spent three years learning to release the arrow. The Master said to release the arrow without tension, like a bamboo leaf holding snow, bending lower and lower until the snow slips off. The bamboo leaf waits without effort until the snow falls off.

In stuttering therapy, the first word of a phrase should be without effort, rolling off your vocal folds like the snow sliding off the bamboo leaf. You shouldn't intend to say the first word, as the archer doesn't open his hand on purpose. The word should say itself, without your planning or calculating or trying.

Herrigel's three years practice releasing the arrow suggests that learning to release the first word of a phrase may also take three years, and be the hardest part of stuttering therapy.

Herrigel was dedicated to his practice, but he couldn't release the arrow smoothly. The Master kept telling Herrigel to become "truly egoless." Herrigel became dejected, and planned to discontinue the archery lessons, concluding that, "all my efforts of the last few years had become meaningless."

Then, one day, after a shot, the Master made a deep bow and broke off the lesson. "Just then 'It' shot!" he cried.

"It" meant that Herrigel had loosed a shot without loosing the shot. "It" had loosed the shot, not Herrigel. The Master could not say anymore what "It" was, just that "It" can only be known through experience.

Only after considerable time did more right shots occasionally come off, which the Master signaled by a deep bow. How it happened that they loosed themselves without my doing anything, how it came about that my tightly closed right hand suddenly flew back wide open, I could not explain then and I cannot explain today...I got to the

point of being able to distinguish, on my own, the right shots from the failures. The qualitative difference is so great that it cannot be overlooked once it has been experienced.

In stuttering therapy, the difference between your relaxed, fluent voice and your tense, stuttering voice is as obvious as night and day—after you learn relaxed, fluent speech. Until then it seems impossible.

The Master then began training Herrigel to shoot at a target, adding, “He who has a hundred miles to walk should reckon ninety as half the journey.”

The Master refused to teach Herrigel to aim, insisting that the target was not the goal, and the goal cannot be aimed at, and that the goal doesn’t have a name, except maybe “enlightenment.”

But even though the Master did not aim, all of his shots lodged in the black center of the target, from sixty feet away.

At first Herrigel tried to shoot without caring if the arrows hit the target. But he couldn’t do this, and “I confessed to him that I was at the end of my tether.”

The Master replied:

You worry yourself unnecessarily. Put the thought of hitting right out of your mind! You can be a Master even if every shot does not hit.

Remember that you can be a Zen master of speech even if you still stutter.

When the Master said he sees “the goal as though I don’t see it,” Herrigel replied that the Master should then be able to shoot blindfolded. The Master then had Herrigel set up the target in darkness, except for one candle. Herrigel could not see the target at all, but the Master shot two arrows. When Herrigel turned on the lights, he saw that not only had both arrows hit the bulls-eye, but the second arrow had hit the first and splintered it!

Herrigel describes the following months as the hardest yet, of

trying to hit the target yet not trying to hit the target. He gradually came to see the value of this training:

It destroyed the last traces of any preoccupation with myself and the fluctuations of my mood.

Finally, the Master had Herrigel shoot in front of spectators, and awarded him a diploma, “inscribed with the degree of mastery.” Before Herrigel returned to Europe, the Master added,

I must only warn you of one thing. You have become a different person in the course of these years. For this is what the art of archery means: a profound and far-reaching contest of the archer with himself. Perhaps you have hardly noticed it yet, but you will feel it very strongly when you meet your friends and acquaintances again...You will see with other eyes and measure with other measures.



Responding to Stress

Stress was a focus of the Iowa therapies. Parents were trained to reduce stress in their children's lives. Adult stutterers were desensitized to their stuttering to make them tougher in stressful situations. Responses to stress and speech-related fears and anxieties were seen as the same thing, with the same treatment.

Fluency shaping stuttering treatments ignore stress.

In the neurological era, we recognize that stressful situations change our brains' neurochemistry. Dopaminergic disorders (page 72), including Tourette's syndrome, obsessive-compulsive disorder (OCD), tics, and stuttering, manifest in stressful situations but not during relaxed situations.

We also now know that responses to stress aren't the same as speech-related fears and anxieties. Preschool stutterers stutter more in stressful situations (their stuttering often starts when they're experiencing unusual stress), but preschoolers don't have speech-related fears and anxieties. Treatments for stress and for speech-related fears and anxieties are different. The latter is covered in the next chapter. This chapter is about learning to handle stress better.

Normal Disfluencies Under Stress

Under stress, people's voices change. They tense their speech-production muscles, increasing vocal pitch. They talk faster. They repeat words or phrases. They add interjections, such as "uh." These are *normal disfluencies*. A study found that under stress, non-stutterers went from 0% to 4% disfluencies. Stutterers went from 1% to 9%.¹⁹¹

The "conventional wisdom" is that stutterers are always nervous or stressed out. Many psychological studies have proven that this

isn't true. But stress has an important role in stuttering.

All stutterers can talk fluently. In relaxed, low-stress situations we can say any sound or word fluently.

In other situations we stutter. How many paraplegics do you know who can walk down country lanes, but not on city streets? Or blind persons who can't see certain people, but can clearly see others? OK, that describes young women after I turned 40, but most blind people are blind all the time.

Our brains are capable of producing fluent speech. We have all the speech motor programs necessary to produce any speech sound, fluently.

We also have speech motor programs for producing disfluent sounds. Stutterers have two sets of open-loop speech motor programs (page 83). Our brains *select* one or the other set of speech motor programs, depending on *environmental cues*—where we are or whom we're talking to.

This is like a person who grew up summers in Vermont and winters in Georgia. Such a person would have a set of speech motor programs to speak with a New England accent. And this person would have a set of speech motor programs to speak with a Southern accent. When she's in Vermont, hearing people speak with New England accents, her brain automatically selects the New England accent speech motor programs. In Georgia, her brain selects Southern accent speech motor programs.

You always have choices for handling stressful situations (even if the choices aren't obvious). Some choices trigger your brain to automatically select disfluent speech motor programs. Other choices trigger your brain to select fluent speech motor programs. This chapter will teach you to make choices that automatically select fluent, relaxed speech. You'll feel relaxed and speak confidently even when non-stutterers are stressed out.

Are Responses to Stress Psychological?

According to "conventional wisdom," stuttering is a psychological disorder because stutterers speak fluently in low-stress situations

and stutter in high-stress situations.

But many responses to stress are physical. For example, “fight or flight” increases heart rate. Stress is considered to be a factor in the development of physical disorders, such as heart disease and gastrointestinal disorders. Why is stuttering considered to be a psychological disorder, but heart disease is considered to be a physical disorder?

Stuttering Reduces Stress

Systolic blood pressure is an indicator of stress. Stuttering reduced stutterers’ blood pressure 10%.¹⁹² In contrast, fluent speech, chewing gum, and sitting quietly each reduced blood pressure about 2%.

You’re thinking, “No way. Stuttering doesn’t relax me. Stuttering doesn’t feel like a massage or a warm bath.”

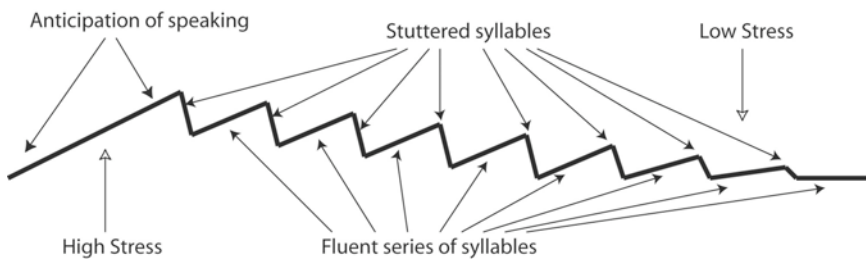


Figure 11: Stuttering Reducing Stress

But think about it. Stutterers are, on average, disfluent on 10% of syllables. We say 90% of syllables fluently. But we don’t say one hundred syllables fluently, and then finish a conversation with ten disfluencies. Stuttering usually occurs on the first sound of the first word, in a stressful situation. In other words, your stress builds up as you anticipate speaking. You stutter, and this releases stress. You then say several syllables fluently.

You then stutter on another syllable, then say several more syllables fluently. Usually your speech improves over the course of the conversation, and your last few sentences are your most fluent.

If your blood pressure were monitored in such a conversation, it

might look like Figure 11 (this is speculative, not based on research).

Your stress increases as you anticipate speaking. You block on the first syllable. This reduces your stress, and you speak fluently. Your stress builds up again, and you stutter again. This reduces your stress, and the cycle repeats until you're speaking fluently at the end of the conversation.

Stuttering Isn't a Good Response to Stress

Stuttering doesn't change the stressful situation. For example, a highway patrol officer pulls you over for speeding. Stuttering won't make the officer think you weren't speeding.

Stuttering might make the situation worse. For example, the highway patrol officer mistakes your stuttering for methamphetamine addiction. He handcuffs you and searches your car. This stresses you more, and you stutter more.

Stuttering and stress are a vicious cycle. Stuttering reduces your stress for a few seconds, but then causes more stress. You get stuck in the cycle, unable to break free.

Another study measured *listeners'* systolic blood pressure.¹⁹³ Listening to stuttering made listeners feel stress. The listeners' increased stress may in turn increase the stutterer's stress. Again, stuttering and stress start a vicious cycle.

This chapter will show you that you have other choices for handling stress, instead of stuttering. These other choices reduce stress, instead of throwing you into an endless cycle.

Distraction and Placebos

A Ph.D. speech-language pathologist wrote, "Distraction methods can be used to eliminate stuttering temporarily."¹⁹⁴ The scientific term for "distraction" is *dual-tasking*. For example, psychologists test cognitive impairment by having a subject count series of tones while looking for symbols in a Yellow Pages directory.

If distractions eliminated stuttering, then stutterers would dual-task when we want to talk fluently, perhaps by working a Rubik's

cube or playing a pocket video game. Two studies investigated this. In the first study, stutterers stepped on and off a 10-inch platform while reading out loud. In the second study, stutterers manually tracked an irregular line on a rotating drum while speaking. Neither distraction was able to reduce stuttering.¹⁹⁵

Dual-tasking can make stuttering worse. Every stutterer who has completed a fluency shaping therapy program (page 80) knows that you can focus on *what* you're saying or on *how* you're talking, but doing both at the same time is a challenge. In other words, using fluency shaping skills in a clinical environment is easy, but the distractions of conversations make using fluency shaping skills difficult.

Beliefs and Placebos

Oliver Bloodstein wrote, "if a stutterer were to forget that he was a stutterer, he would have no further difficulty with his speech."¹⁹⁶ Gunars Neiders wrote, "our beliefs about stuttering seem to be one of the main factors in stuttering severity."¹⁹⁷

These hypotheses have been repeatedly proven wrong—but not in studies set up for that purpose. Instead, studies of medications to treat stuttering are usually *placebo-controlled*. A placebo is a pill without a medication. The purpose of a placebo is to make study subjects believe that they are getting medication that will treat their disease or disorder. In other words, study subjects are all told that they will receive a medication that might (or might not) reduce their stuttering, but only half the subjects get the medication. The other half get the placebo pills. The latter are perfect subjects for testing the hypothesis that believing you won't stutter will lead you to not stutter.

A study found that placebos did not reduce stuttering.¹⁹⁸ Another study also found that placebos had no effect on stuttering—but the placebos caused terrible side effects!¹⁹⁹ Reported placebo side effects included constipation, sexual dysfunction, dizziness, sweating, and tremors. The placebo produced six times more side effects than the medication in the study.

This raises an interesting question. Placebos are effective treatments for almost every disease and symptom:

Study after study showed that, for virtually any disease, a substantial portion of symptoms—roughly one-third, by most estimates—would improve when patients were given a placebo treatment with no pharmacological activity. Patients simply believed that the treatment would help them, and somehow, it did.²⁰⁰

...for a wide range of afflictions, including pain, high blood pressure, asthma and cough, roughly 30 to 40 percent of patients experience relief after taking a placebo...placebos seem to be most reliably effective for afflictions in which stress directly affects the symptoms...pain, asthma and moderate high blood pressure can become worse when the patient is upset...placebos may work in part by lessening the apprehension associated with the disease [because] the immune system falters under stressful conditions.²⁰¹

Stuttering may be the only disorder that placebos have no effect upon! In other words, stuttering isn't affected by belief, and stutterers can't be "psyched" into fluency. In contrast, heart disease, asthma, etc. appear to be physical diseases but are actually in large part psychological (or psychophysiological or psychosomatic). Could stuttering—long believed to be entirely psychological—actually have no psychological component?

Good Stress, Bad Stress

We experience many forms of stress. Some forms of stress reduce stuttering. Other forms of stress increase stuttering.

Stress is defined as

the condition that results when person-environment transactions lead the individual to perceive a discrepancy, whether real or not, between the demands of a

situation and the resources of the person's biological, psychological or social systems.²⁰²

Stress is divided between *distress*, or stress leading to anxiety or depression; and *eustress*, or stress that enhances function, such as sports training or challenging work.

Reactivity to stress is also divided into two types. There's an emotional response that appears to be automatic and uncontrollable, and a cognitive response that is conscious and under volitional control. *Stress management* trains individuals to change emotional responses into cognitive responses, and to become more aware of available resources, thus enabling individuals to choose resources to handle situations while experiencing less stress.²⁰³

My definition, based on personal construct therapy, is that stress is the absence of choices, and stress management teaches individuals to see that they have choices in every situation.

Adrenaline and Fluency-Enhancing Stress

In World War Two, a severe stutterer regularly spoke fluently for mortar communication during combat.²⁰⁴

I was once physically threatened by a person for several hours. I've never been so fluent in my life! My voice was calm and relaxed as I tried to get the person to calm down.

Noradrenaline and adrenaline compete with dopamine for the binding sites on D4 receptors, and when bound, act as agonists. At the same time, through feedback inhibition, norepinephrine inhibits tyrosine hydroxylase, which in turn inhibits the production of dopamine. Because dopamine in the striatal system increases stuttering (page 72), and adrenaline blocks dopamine, "fight or flight" situations that increase adrenaline reduce stuttering.²⁰⁵

Stutterers report that when the adrenaline wears off, their stuttering increases.²⁰⁶

Cognitive Stress

Hearing or seeing several things at once, especially if the events contradict each other (*cognitive dissonance*), increases stuttering.

For example, I can't stand talking to a person who's watching television. Or a person who's playing guitar, or picks up the phone to make a call while I'm trying to talk to him. I have a cousin who watches TV, plays guitar, and makes telephone calls, all at the same time, when I try to talk to him.

Listeners should give their full attention to stutterers. Turning away to do something else, even if you say, "I'm still listening," will increase the individual's stuttering.

If a listener won't give you his or her full attention, consider whether the conversation matters to you. If not, walk away.

Time Pressure

Time pressure increases stuttering. At the beginning of this chapter I mentioned a study in which stress increased disfluency.²⁰⁷ The study began with subjects seeing "red" written in red on a computer monitor. They had to say "red." The screens came faster and faster, to increase time pressure.

Next, cognitive stress was added. For example, the word "red" was written in yellow on a computer monitor. The subjects had to say "yellow," not "red."

These results were dramatic. Non-stutterers went from 0% disfluent words, to 2% disfluencies with time pressure, then to 4% with time pressure and cognitive stress.

Stutterers went from 1% stuttered words, to 3% with time pressure, to 9% with time pressure and cognitive stress.

Telling a stutterer to talk faster will have the opposite effect. Instead, tell stutterers to take all the time they need.

Use time pressure to your advantage by limiting what you say. Tell most people to make a five-minute speech and they ramble on for ten minutes, without getting to the point. If you're asked to make a five-minute speech, get to the point in one minute, without the rambling. What you think is one minute will actually take two

or three minutes, and then adding in stuttering will make it five minutes. Even when I stuttered severely I had professors compliment my presentations.

Pragmatic Speech

Pragmatic speech is intended to cause another person to do a specific action. This might be telling a co-worker how to send a fax. Don't say, "Let me do it for you."

More stressful is asking someone to do something you want, when you're afraid that the person will say no. For example, asking your boss for a raise, or asking an attractive person out on a date. The listener is relatively powerful, and you're in a position of relative weakness.

To reduce stress, we usually try to make the question look casual. You "just happen" to run into the attractive person at the health club, and you "just happen" to have tickets to a show in your pocket, and you "casually" ask for a date. Or you wait until you've just landed a big sale for the company, and "jokingly" tell your boss that you deserve a raise.

But then you stutter, belying that this "casual" conversation is stressful for you. Your listener recognizes your weak position and, if he or she has an ego problem, enjoys manipulating you. A powerful person with an ego problem manipulating you is a pretty good description of stress.

Instead, use other ways to reduce stress. First, don't make a big effort to set up a "casual"-seeming situation. The more effort you make, the more stress you'll feel that it's "now or never" to get a positive response.

Next, use Winston Churchill's strategy (page 175) of preparing your points in advance ("I deserve a raise for three reasons..."), anticipating your listener's objections, and preparing responses to those objections.

Then use slow speech to explain each point. Pause between points. Use the pause to check that your breathing and vocal folds are relaxed. You'll sound confident and in control.

Lastly, be willing to walk away. Is it the end of the world if you don't get a date? Visual what you'll do and how you'll feel if the answer is no.

Mirroring Speech Patterns

People tend to mirror each others' speech patterns. A person speaks fast to you, so you talk fast. A listener jumps in before you finish your sentences, so you interrupt her sentences. A person gets angry at you, so you raise your voice and get emotional.

Conscious choice requires slow reactions. In a fast reaction to environmental stimuli, your brain will select the most myelinated (habitual) open-loop motor program (page 82). Interrupting people, or responding quickly in a conversation, is a fast reaction.

Instead of mirroring, be an anti-mirror. The faster others speak, the slower you respond. Instead of interrupting, wait for the other person to finish their sentences, then count to three before you start to talk. If a person expresses anger, make your voice quieter, slower, and less emotional. You'll sound in control of the conversation as well as talk more fluently.

Embarrassment and Uncertainty

We fear embarrassment. For example, I'm about to call you Josh, when I think, "Wait, his name is Joel."

This fear is multiplied when we're speaking to more than one person—saying something embarrassing in front of an audience of a thousand people is more embarrassing than in front of one person.

Lack of feedback increases our fears of embarrassment. In other words, when speaking on television we can't observe the reactions of listeners. You could say something stupid and never know it. You try to remember and analyze the last thing you said while you're saying something else.

If you say something embarrassing, make a joke out of it, e.g., "at my advanced age I can't remember names." That's funny whether you're 90 or 19. Acknowledging embarrassment ends

embarrassment.

Establishing Status

We communicate status largely via speech. We feel anxiety when status is ambiguous.

For example, you find a large, muscular hoodlum sitting on your car. Do you speak with firm authority, ordering the hoodlum off your car? Do choose a friendly, buddy-buddy tone of equality? Do you meekly ask if the hoodlum could let you have your car back? Or do you thank the hoodlum for watching your car and hand him \$5?

Stuttering doesn't necessarily communicate low status. Embarrassment and anxiety about stuttering communicates low status. Calmly stuttering, while looking the hoodlum in the eye, establishes that you're not afraid to stutter and you're not afraid of the hoodlum.

Moral Stress

Whether you tell the truth or lie, you can use stuttering to make listeners believe that you're telling the truth. Interrogations start with "baseline" questions such as your name. Do some voluntary stuttering and get into some good disfluencies on your name.

In a stressful situation, imagine yourself hooked up to a lie detector machine. Start the conversation with a topic unrelated to the big issue. Do some voluntary stuttering. Imagine making the lie detector needle swing into the red.

Then change the topic to the main issue, pause, relax your breathing and your vocal folds, and slowly and fluently tell your story—truthfully or otherwise. A lie detector machine will indicate that you're telling the truth. A human listener will do the same.

Treating Stress in Stutterers

Everyone is nervous about some speaking situations. Public speaking is humanity's most common fear, greater than the fear of

death. Few women have the courage to introduce themselves to a man and ask for a date. Ordering in a French restaurant is scarier than ordering at McDonald's.

Increase Your Resources

If stress is more demands than you have resources to handle (page 134), increase your resources. But first rent the video *Predator*, starring Arnold Schwarzenegger and Jesse Ventura. Settle down with a bowl of popcorn to watch the governor of California and the governor of Minnesota discuss school funding and property tax reform.

Just joking. Back in 1987, Schwarzenegger and Ventura were action movie heroes. In *Predator* the men are dropped into a jungle full of enemy soldiers, and one nasty alien. But they arrive with a whole lot of resources, such as an M-134 7.62mm minigun and an M-79 grenade launcher.

Now write down a list of speaking tasks that you don't do, that non-stutterers don't think twice about doing. Let's say that you're afraid to leave voicemails on answering machines. Write down all the speech therapy tools you can use in this situation. Imagine yourself as Schwarzenegger and Ventura making a list of weapons to bring. But instead of arming yourself with a minigun and a grenade launcher, your weapons for voicemail could include:

- Practicing your message before you call.
- Fluency skills, such as slow speech with stretched vowels, relaxing your breathing, or relaxing your vocal folds.
- Using a DAF/FAF anti-stuttering device.
- A hierarchy of stress, beginning with calling your own answering machine, then calling your speech-language pathologist's answering machine, then calling a friend's answering machine, then calling a business's answering machine (e.g., calling restaurants before they open asking if they have banquet facilities), and finally calling that attractive person's voicemail.

Don't stop listing your arsenal until you look at the list and

laugh at how you'll blow away that poor little voicemail. Then think of one more weapon to add to your list. You're ready when you're confident that you won't stutter.

Let's say that your message is, "You're the most wonderful person I've ever met. I can't wait to see you again." Using all of your fluency weapons, pick up the phone and call your own answering machine. Then check your messages. Pretty good, huh?

Now call yourself again. This time, reduce or throw away one of your weapons. If you used one-second stretched syllables on the first call, call yourself using half-second stretch. Then go to quarter-second "slow normal" speech.

If you used an anti-stuttering device on the first call, don't use the device for your next call.

If you practiced the message on the first call, say something spontaneous on your next call.

Step by step, throw away your weapons, until you can call your own voicemail fluently, without effort or fear.

Choose one stuttering treatment from the Iowa era, perhaps voluntary stuttering (page 151); one treatment from the fluency shaping era, e.g., relaxed vocal folds (page 80); and one treatment from the neurological era, e.g., an anti-stuttering device (page 55). Don't select all your fluency skills from one era.

Make a Stress Hierarchy

Now take a step up the stress hierarchy. Call your speech-language pathologist and leave a message. (If you're not in speech therapy, call a nice friend or kindly relative.) Begin with your full arsenal of fluency weapons, then call back, using fewer fluency weapons. Then work your way up your stress hierarchy. If you feel any twinge of fear on a call, take a step back until you feel confident again.

Approaching feared speaking situations can be like fighting a grizzly bear armed only with a pocket knife. Scary speaking situations combine to look like a ten-foot-tall bear. Speech therapy programs typically give you only one weapon.

Divide your general fear of speaking into specific fears. The giant bear becomes many small bears. Now create a stress hierarchy, with a small bear on one end, and a bunny rabbit on the other end. And instead of having one weapon, you now have a variety of fluency skills.

Now you're armed like Arnold Schwarzenegger, you're hunting bunny rabbits, and you're in a pet shop the day before Easter. Armed to the teeth with speech therapy skills, there's no possibility of stuttering in your feared situation. Heck, it isn't even a feared situation anymore!

Further Reducing Fears and Anxieties

When you run out of stressful situations, make a list of speaking situations that scare non-stutterers. Remember when I said that your speech can be better than non-stutterers? When you're ready, move on to these areas:

- Go up to strangers at parties. Say that your speech therapist wants you to talk to strangers and ask if you can talk to this person. If you have an anti-stuttering device, ask if it's OK to use it. No one is going to say no. I met one of my ex-girlfriends this way.
- Join Toastmasters International to learn public speaking.
- Sign up for a beginning acting class at a university or community theater. Acting classes are the most fun you've had since sixth grade.
- Put together some funny stories and perform stand-up comedy on amateur night at a nightclub.
- Sign up for voice lessons. Amaze people by singing at social occasions.
- Learn a foreign language. Talk to cab drivers in their native tongues.

Reduce Your Listener's Stress

Stuttering is a rare disorder. Many people have never met a stutterer. Some listeners think that they did something to make you

stutter. Other listeners wish there were something they could do to help you. Tell them that you stutter. If they have any questions about stuttering, they'll ask you.

Make a joke about stuttering (page 163). Or put stuttering on your business card, perhaps describing you as chapter leader of your local stuttering support group.

Tell listeners that you're using speech therapy skills, and explain what those skills are (e.g., voluntary stuttering, slow speaking rate). Ask the listener to remind you when you miss a target, e.g., increase your speaking rate.

Lastly, if you use an anti-stuttering device (page 56), show it to your listener and ask if she minds if you use it. Listeners invariably ask questions about the devices. In contrast, listeners rarely ask questions about speech therapy, e.g., vocal fold relaxation isn't of great interest to the general population. But everyone wants to know how anti-stuttering devices work. Suggest that the listener try on the device, and adjust it to make the listener stutter (by maximizing the delay, or moving the pitch shift up and down). When I do this, other people come over to see what's making their friend trip over his or her words. They give me positive feedback about my stuttering, laugh at their own failure to talk, and experience for a few minutes what it feels like to stutter.

Increasing or Decreasing Stress in Therapy

Stuttering therapy typically begins with a stutterer learning closed-loop speech motor control in a low-stress environment, e.g., chatting with the speech-language pathologist, or alone practicing word lists.

The stutterer gradually moves from closed-loop speech motor control to open-loop speech motor control. When he achieves fluent open-loop speech motor control, the speech-language pathologist takes him to a shopping mall for "transfer" practice. Then they're finished with speech therapy and he's on his own.

The result is open-loop fluent speech in low-stress environments, and relapse to open-loop stuttering in high-stress

environments. The relapse shakes the stutterer's self-confidence. Or the stress de-myelinates (weakens) fluent speech motor programs. A single high-stress, disfluent experience might destroy weeks of low-stress practice.

The stutterer then gets into a vicious cycle of stress and relapse leading to more stress and more relapse.

A better plan would be to train a stutterer to recognize stressful situations, and consciously switch to closed-loop speech motor control (i.e., very slow speech, page 85) in high-stress environments.

For example, I used to meet strangers and say, "My speech-language pathologist wants me to talk to strangers. May I talk to you?" I would then use slow closed-loop speech motor control. After we had a friendly conversation going and my fears and anxieties diminished, I'd use the "slow-normal" speaking rate that mixes open- and closed-loop speech motor control.

With traditional therapy the stutterer switches between stuttering and fluent speech, as situations change between high-stress and low-stress. Instead, I switched between closed-loop and open-loop speech motor control, as stress changed. The result was that I constantly myelinated (strengthened) the fluent speech motor programs in my brain.¹⁴

Personal Construct Therapy: You Always Have Choices

No one needs to be completely hemmed in by circumstances; no one needs to be the victim of his biography.²⁰⁸

— George Kelly, *The Psychology of Personal Constructs*
(1955)

In every situation, you always have a choice of how to react. This insight is the basis of *personal construct therapy* (PCT). The goal of PCT is to develop awareness of your choices in every situation. The antithesis is to react the same way to all stressful situations.

If you make the same speech choices in high-stress situations, no amount of practice in a low-stress speech clinic will change your speech. For example, if you always substitute words “when the going gets tough,” you’re not going to use gentle onsets in a difficult situations, even after practicing 5,000 gentle onsets in the speech clinic.

To develop awareness of your choices, describe a situation in which you stuttered. Imagine different ways you could have responded to the situation.

Role-play the scene with your speech-language pathologist or in your stuttering support group. When someone sees a choice that hasn’t been played, switch roles, for that person to play the new choice. For example, the situation is answering the telephone at work. One person pretends to be a caller, and the other pretends to be the employee answering at Pasquale’s Pizza. The employee uses slow speech. But another choice might be to switch to voiced consonants (page 100), i.e., answering the phone *Basdahllee’s Bizza*. You should be able to think of a half-dozen other possibilities. Role play each choice and see what feels best.

Verbal Aikido

Aikido is a Japanese martial art. Combatants focus not on punching or kicking opponents, but rather on using the opponent’s own energy to gain control of the opponent or to throw the opponent away from you.²⁰⁹

Verbal aikido is the art of not arguing, but instead agreeing with someone who is verbally attacking you. You help the assailant attack you, until—surprise—he realizes that he’s just been made to look like a fool.

For example, a middle-aged, overweight woman owned a chain of women-only health clubs. Middle-aged, overweight women could work out in these health clubs without feeling intimidated by young male bodybuilders.

A “shock jock” radio host invited the health club owner onto his show. He described her physical appearance, then asked why

anyone would want to work out at a health club owned by a fat, ugly old lady.

She responded that overweight, middle-aged ladies have to exercise too, and that the “shock jock” was a perfect example of the men she didn’t want to have to be around when she exercised.

The example of the parents responding to their teenagers’ four-letter words (page 41) is another example of verbal aikido.

Use verbal aikido to turn around the stress. For example, a highway patrol officer pulls you over for speeding. Instead of trying to hide your stuttering, you make a joke: “I stutter, so I’m not going to try to talk you out of giving me a ticket.”

Changing Self-Descriptions

Many stutterers improve their speech, yet continue to believe that their speech is worse than non-stutterers. Graduates of fluency shaping therapy programs sometimes have beautiful, clear speech that is easier and more pleasant to listen to than non-stutterers’ speech. Yet they continue to believe that they can’t do certain things, such as public speaking.²¹⁰

In contrast, stutterers who improve their speech attitudes have better speech a year after completing therapy, as compared to stutterers who maintain poor attitudes.²¹¹

Write a description of yourself now, and who you expect to be in five years. What items are opposite in the two descriptions? E.g., now you’re now single, but in five years you hope to be married.

Write a description of yourself as a stutterer, and then who you’d be if you didn’t stutter. E.g., assertive vs. shy, or popular vs. lonely. These descriptions are your *personal constructs*.

Work on changing your personal constructs. Again, imagine specific situations for each personal construct. For example, if you wrote that you’d be assertive instead of shy, describe a recent situation in which you weren’t assertive. Now role-play the scene with your speech-language pathologist or your support group. Imagine different ways to react in the situation and switch roles.

“Who Would I Be If I Didn’t Stutter?”

This is a favorite conversation topic at stuttering support groups. People initially say, “I’d be more successful at work” or “I’d be more assertive with my husband and family.” They first think their lives would be better without stuttering.

After fifteen minutes, people start saying, “If I didn’t stutter, I’d be less compassionate,” or “I would never have developed my musical talent.” People realize that they chose a career in a “helping profession” (e.g., nursing or teaching), or they developed non-verbal skills, such as athletics or painting, because they stutter. They realize *positive* aspects of stuttering. They see that stuttering can be a gift.

In contrast, a stutterer completed a speech therapy program, but refused to speak fluently. He said that his co-workers had listened to his stuttering for 20 years. He asked, “What would they think if I came to work speaking fluently?”

Another stutterer was earning \$25,000/year as a computer programmer. His supervisor left, and the company wanted to promote the stutterer. He would receive a salary of \$55,000/year. The management position required talking to clients on the telephone. The company offered to pay for speech therapy and an anti-stuttering device. The stutterer refused the promotion, saying that he didn’t want to talk to anyone. The company instead hired a less-qualified manager from outside the company.

For these stutterers, the psychological issues surrounding stuttering are more disabling than their disfluencies.

Change Your Lifestyle

As you improve your fluency, ask your supervisor for tasks that require talking. Participate in social activities that involve talking.

Training a new motor skill requires about three million repetitions (page 121). To say three million words, you must talk at least four hours a day for at least six months.

Take an acting class. Take singing lessons. You’ll have fun, and meet new people. You’ll get over your speech-related fears.

You'll find some things other people can easily do that you can't, but you'll also find things you can easily do that other people can't. For example, I took a public speaking course. I was able to project my voice, when other students are afraid to raise their voices. I was able to switch emotions (anger, sadness) easily and convincingly, when other students couldn't. On the other hand, there were simple presentations where you couldn't understand a word I said.

Volunteer to read to blind or elderly individuals. Volunteer at a hospital directing visitors where to go. Volunteer with your public radio station answering pledge week calls.

Or moonlight at a job that requires talking. Find a job that requires being charming and friendly.

Join social clubs that requires talking. Put Toastmasters at the top of your list. Members give a series of ten speeches, usually one speech per month. The speeches are four to ten minutes long. Each of the ten speeches teaches you a new skill, such as using gestures and body language, or being persuasive on a controversial topic. Judges always point out things you did well—and award lots of ribbons—as well as ways you can improve. You'll find that even if you stutter severely, you're better than non-stutterers at some aspects of public speaking.

The National Stuttering Association has its own public speaking training program, which is quite different from Toastmasters. Ask for the "Speaking Circles" video.



Speech-Related Fears and Anxieties

In 1928, a Freudian psychologist advanced a theory that stuttering was an attempt to satisfy unresolved oral-erotic needs.²¹² If this were true, there would be stuttering phone sex lines. Imagine finding ads in the back of *Playboy* magazine with scantily dressed women saying, “Call me! I stutter!”

A 1939 personality test study found that stutterers were more neurotic, more introverted, less dominant, less self-confident, and less sociable than non-stutterers.²¹³ Examination of the personality test found sixteen speech-related questions, including “If you are dining out do you prefer someone else to order dinner for you?” The psychologists had interpreted stutterers’ reluctance to order in restaurants as evidence of neuroses, rather than as difficulty talking.

A 1952 study of hostility and aggression found stutterers more likely to turn hostility inward. A 1953 study found the opposite.²¹⁴

Other psychological studies found no difference between stutterers and non-stutterers for self-concept, levels of aspiration, body images, role perception, handwriting, social maturity, birth order, exaggerated fears, sleep disturbances, hyperactivity, temper tantrums, thumb sucking, and nail biting.²¹⁵

Stutterers are, on average, psychologically normal, except for speech-related fears and anxieties. We generally have the same speech-related fears and anxieties as non-stutterers, such as fear of talking to strangers and fear of speaking to an audience, but these fears are greater in stutterers.

Hiding Stuttering, Avoiding Speaking

How do we hide stuttering? Let us count the ways.²¹⁶

Stutterers will drive an hour to see if a store has an item, to

avoid a one-minute telephone call to ask if the store has the item.*

I received a call from a woman who was considering divorce. Her husband was a stutterer, and had requested and received a demotion to a job that required no talking to anyone. He'd stopped talking to his wife and children and no longer socialized with friends.

I received a call from an army colonel who was able to completely hide his stuttering by substituting words. But in presentations and he couldn't read his PowerPoint slides aloud. If he read the text as written, he stuttered. If he substituted words, he appeared to be illiterate.

At a stuttering convention I listened to a man complain about the fluency shaping therapy program he'd attended. "They wanted me to talk like this!" he said, perfectly fluently. He thought that the relaxed, easy speech sounded weird. He said, "I've worked with the same guys for ten years. What would they think if I came to work one day talking like that?"

Being shy about talking to strangers is normal. Feeling embarrassed when you stutter, especially if a listener reacts negatively, is normal. But when hiding and avoiding stuttering causes you to behave abnormally, you don't have a stuttering problem. You have a hiding stuttering problem.

The Iowa Therapies

The first modern treatments for stuttering aimed to reduce hiding and avoidance. In 1927 Lee Edward Travis became the first director of the University of Iowa Speech Clinic.²¹⁷ Travis had a personal interest in stuttering and encouraged three of his students to conduct research and develop new treatments for the disorder.

* On the other hand, some of the "urban legends" about avoidance leave me skeptical. No stutterer has ever told me that in restaurants he orders foods he didn't like, because he could say, for example, "liverwurst" or "anchovies."

the new therapeutic approach for which [Bryng] Bryngelson, [Wendell] Johnson, and [Charles] Van Riper opened the way was aimed at a reduction in the fear and avoidance of stuttering...This approach represented a sharp departure from the philosophy on which the older methods were based. Bryngelson, Johnson, and Van Riper were severely critical of those methods...such methods served in the long run to intensify rather than decrease fear because in effect they said to the stutterer, "Don't stutter. Swing your arms or talk in some odd and unnatural way, but whatever you do, don't stutter." And the implication was that hardly anything was more unusual or grotesque or more to be feared and avoided than stuttering. By contrast, the new approach was to say to the stutterer, "Go ahead and stutter. But learn to do so without fear and embarrassment and with a minimum of abnormality."²¹⁸

Bryngelson: Voluntary Stuttering

The first of Travis's students, Bryng Bryngelson, who was not a stutterer, encouraged stutterers to develop an "objective attitude," including

the ability to discuss their stuttering freely and casually with others. It meant the willingness to enter difficult speech situations and the refusal to make use of word substitutions or other tricks for avoiding stuttering. In general, the goal was to bring the problem out into the open and to be willing to stutter. This lent itself to the use of group therapy in which people who stutter were encouraged to ventilate their feelings about their speech problem...It also led to a great emphasis on "situational" work in which clients were taken outside the speech clinic and challenged to demonstrate their ability to maintain an objective attitude in feared situations...the teaching of an objective attitude through situational work is today still used by many speech pathologists [to treat adult stutterers].²¹⁹

A particularly distinctive contribution that Bryngelson made...was a technique he termed "voluntary stutter-

ing.”...If attempts to stutter voluntarily on a difficult word resulted in an involuntary reaction [i.e., real stuttering], clients were to repeat the attempt until the block was completely under their control. In principle, Bryngelson advocated that stutterers learn to imitate...their own...stuttering behavior, but he found that it was easier for stutterers to stutter on purpose when they produced a simple, effortless repetition of initial sounds.²²⁰

Voluntary stuttering is still taught today.²²¹ But note that Bryngelson’s clients changed voluntary stuttering from imitating their own stuttering behavior, to instead doing “simple, effortless” repetitions. Relaxed, effortless repetitions are a strategy to produce slow, relaxed speech motor movements. While this might be somewhat effective, fluency shaping therapy (page 80) is more effective for this goal. A recent article highlights this point:

When using voluntary stuttering for desensitization purposes, the speaker should stutter in a clearly noticeable or “hard” manner so it is clear that he or she is a stutterer. In other words, the speaker should not “cheat” the situation by stuttering softly or in a subtle manner. The speaker also may consider using voluntary secondaries as well, such as voluntary eye blinking and voluntary head movements.²²²

Johnson: Perceptual and Evaluative Reorientation

Travis’s second student, Wendell Johnson, focused even more closely on fear of stuttering.²²³ Johnson believed that stuttering was caused by the fear of stuttering, even in young children, and this became his *diagnosogenic theory*.

Johnson is best known for developing *indirect therapy* (page 33) for children who stutter, but he also developed treatment for adult stutterers.

Clients carefully observed their stuttering behavior before a mirror and by means of tape recording to determine just what they did to prevent themselves from

speaking...They observed the disfluencies of normal speakers in order to discover that normally fluent speech was not perfectly fluent speech. They made scientific observations of the reactions of their listeners to find out, by and large, listeners were more tolerant of their stuttering than they had assumed.

[In his later years he focused on] training stutterers to be conscious of the inappropriateness of the language they tended to use in talking about their problem...individuals who came for treatment were taught to examine carefully what they meant when they referred to themselves as “stutterers,” as though assuming that there was something about them that marked them as basically different from other people, or when they referred to what they did when they talked as their “stuttering” or “it” as though their problem was not what they did when they talked, but a think inside of them that they needed to manage, stop, or control.

Finally...Johnson proceeded to place major emphasis on a great deal of actual speaking by stutterers—an increase both in speaking time and in the number of situations in which speech was attempted—with attention to “going ahead and talking” on the assumption that there were no basic physical or emotional reasons for not doing so.²²⁴

Van Riper: Stuttering Modification Therapy

Travis’s third student went on to have the most influence of any speech-language pathologist in the field of stuttering. Charles Van Riper developed his therapy between 1936 and 1958.²²⁵ His therapy continued Bryngelson’s and Johnson’s focus on reducing the fears and anxieties of adult stutterers,²²⁶ but then added methods to modify stuttering’s core behaviors to be less physically stressful. His therapy is one of the most widely practiced stuttering treatments today.

Stuttering modification therapy has four phases: identification, desensitization, modification, and stabilization.

The *identification* phase is similar to Johnson’s clients observing their stuttering behaviors. You begin with identifying the core

behaviors, secondary behaviors, and feelings and attitudes that characterize your stuttering. The goal is to improve your awareness of what you do when you stutter. Next, your speech-language pathologist trains you to identify and become aware of your avoidance behaviors, postponement behaviors, starting behaviors, word and sound fears, situation fears, core stuttering behaviors, and escape behaviors. Finally, you identify feelings of frustration, shame, and hostility associated with your speech.

The *desensitization* phase “toughens” the stutterer, in three stages. First, in the *confrontation* stage, you’re forced to accept that you stutter. You’re expected to tell people that you stutter, and talk about what you are doing in therapy to change your stuttering. Next, you *freeze* your core behaviors—repetitions, prolongations, and blocks. When you stutter, your speech-language pathologist raises a finger. You hold what you are doing, until she drops her finger. For example, if you were repeating a syllable, you have to continue to repeat that syllable. Your speech-language pathologist will make you freeze these core behaviors for longer and longer periods. The goal is for you to become less emotional or more tolerant of these behaviors. The third stage is Bryngelson’s *voluntary stuttering*.

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therapy activities. Another sub-goal is “the automatization of preparatory sets and pull-outs.” The last subgoal, similar to Johnson’s semantic therapy, is for you to change your self-concept from being a person who stutters to being a person who speaks fluently most of the time but who occasionally stutters mildly.

Efficacy of Stuttering Modification Therapy

About a dozen studies have measured the efficacy of stuttering modification therapy.²²⁷ Most of these studies weren’t high quality, such as using stutterers’ self-reports of improvement without measuring stuttering, or counting the number of subjects who had improved speech but not saying how much their speech improved.

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In the introduction (page **Error! Bookmark not defined.**) you read an exchange of letters about a study of a stuttering modification therapy program. The researchers followed nineteen adult stutterers in the 3.5-week Successful Stuttering Management Program (SSMP, developed by Dorvan Breitenfeldt and Delores Rustad Lorenz). Immediately post-treatment their speech improved 10%. Six months later this modest gain had all but disappeared. Several measures of anxiety found a 10-15% psychological improvement. The researchers cautioned that six months isn’t a long follow-up, and that this psychological improvement might not last, given the absence of improved speech. The researchers concluded, “...the SSMP appears to be ineffective in producing durable improvements in stuttering behaviors.”²²⁹

But if fluent speech isn't the goal of the Iowa therapies, these efficacy studies may be missing the point. The goals of stuttering modification therapy—reducing speech-related fears and anxieties—are difficult to measure, and I believe that these therapies are best way to reduce speech-related fears and anxieties.

Change vs. Acceptance

Should stutterers change their speech? Or should stutterers accept themselves as they are and not try to be someone else?

A similar argument is heated in the deaf community, regarding whether deaf children should receive cochlear implants. The view that deaf individuals aren't disabled but rather are "differently abled" is supported by brain scans finding that deaf individuals' auditory processing areas are used for other sensory processing, giving such individuals sensory abilities that hearing people lack. Also, the deaf community ("deaf culture") is strong, with its own language, schools, and organizations. On the other hand, parents refusing to allow a deaf child to receive a cochlear implant (which more or less cures deafness) seem immoral.

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"switch gears" to a self-approving position by giving oneself credit for any degree of progress made or trying to be made rather than yielding to all the familiar negative and self-defeating thoughts which tend to overwhelm any degree of success.²³⁰

Change and acceptance work together. When my speech was

out of control, I tried to ignore my stuttering (see “Denial,” page 160). But when I developed *some* fluency, I wanted to tell my friends what I’d done. My friends’ positive responses made me feel *some* acceptance that I stuttered. Acceptance helped me work more to improve my speech, and improved speech gave me more acceptance. Change and acceptance work together, in a “virtuous” circle.

In contrast, change without acceptance doesn’t work, and acceptance without change doesn’t work. The former individuals seek instant, effortless, invisible, 100% miracle cures. They don’t want anyone to know that they went to speech therapy or are wearing an anti-stuttering device. These are the people who want anti-stuttering medications.

The latter individuals go to National Stuttering Association conventions. I went to three conventions and then stopped going. I wanted to talk about stuttering treatments, while everyone else was heartily accepting each other as they were.

Are Clinicians Responsible for Clients’ Speech?

Speech-language pathologists have a parallel issue. Catherine Montgomery, CCC/SLP, of the American Institute for Stuttering in New York City, wrote of her experiences:

I had been taught as a young clinician that my clients’ progress was pretty much 100% my responsibility. This created my burn out and a neediness on my part for them to do well. If they did well, then I was OK. It meant I was a good clinician. This sense of neediness undoubtedly set up a dynamic in the clinical relationship that was not healthy for me or for them.

I now believe that for most of our clients who stutter, from school age on up, that one of our primary jobs is to facilitate their independence and empowerment. Thankfully, I learned how to let go. I now know to develop a partnership attitude with each client, that I am here to do the very best I know to do for and with them, but that there has to be a point where I step back and let them

take over. You know, “you can take the horse to the water...”²³¹

Locus of Control

Barry Yeoman, a long-time member of the National Stuttering Association, wrote in the magazine *Psychology Today* that “achieving fluency...is nearly impossible” and “stuttering is a physical impediment for which little can be done.”²³²

Locus of control is associated with assignment of causality of a given condition. A person with an *external locus of control* sees stuttering as something that happens to him, and therapy as something that a speech-language pathologist does to him. Barry Yeoman has an external locus of control regarding his stuttering.

In contrast, a person with an *internal locus of control* sees stuttering and stuttering therapy as something that he does and has at least some control over. An individual who says, “I can beat stuttering if I try hard harder” has an internal locus of control.

A study found that internal vs. external locus of control did *not* predict fluency two years after completing a stuttering therapy program.²³³ However, that study only examined one stuttering treatment (a fluency shaping therapy program). It’s possible that different stuttering treatments are more effective for persons with internal vs. external loci of control. E.g., if you have an external locus of control, you might do better with anti-stuttering medications or another treatment that does something to you. If you have an internal locus of control, you might get better results from stuttering modification therapy or another therapy that you do for yourself.

If you say, “I’ve been to stuttering therapy, I just have to remember to use my therapy skills” then you’re headed for an internal locus of control trap. You may be blind to people who could help you, e.g., you refuse to join a stuttering support group; or blind to other stuttering treatments, e.g., your state offers to give you a free anti-stuttering telephone.

An external locus of control trap is to try a stuttering treatment, it doesn't work, and you give up and conclude that no stuttering treatment works. Consider why crazy weight-loss diets attract customers. People try the "pizza and ice cream" diet, it doesn't work, and then say that they tried to lose weight but the diet didn't work. Therefore no diet or exercise plan will ever work and they have an excuse to be overweight. These people chose the fad diet instead of the salads and running ten miles a day diet because they knew it wouldn't work.

Inward vs. Outward Anger

Stuttering, like any frustrating experience, causes anger. Some individuals direct these feelings inward (i.e., they hate themselves). This leads to a vicious cycle or "self-fulfilling prophecy" of failure.

But other stutterers direct these feelings outward. These individuals feel anger at other people. Their relationships at work or socially go poorly, again creating a vicious cycle of failure.

How do you feel when people disrespect you when you stutter? Do you feel anger at yourself for stuttering? Or do you feel anger at the person who treated you poorly?

When you're angry, do you do nothing, but get angrier inside? That's inner-directed self-hatred.

Or do you take action to "send a message" nonverbally—which the other person is certain to misunderstand? I once "sent a message" to my housemates that it was their turn to buy toilet paper. Don't ask me what I did! They didn't get the message. They just got angry back at me. That didn't lead to domestic bliss.

Earlier I suggested that you use slow, stretched syllables when telemarketers call (page 118). Do you look forward to annoying telemarketers? If so, you direct your anger outward. But if you're afraid to annoy telemarketers, then you direct your anger inward.

If practicing speech therapy with a telemarketer scares you, have your speech-language pathologist pretend to call you. She'll try to sell you slow pitch bats, slow blow fuses, stainless steel slow cookers, and slow jam CDs. If you can't think of anything to say, ask,

“How slow are the slow pitch bats?”

Then call her, reversing roles. Convince her that your slow cookers are the slowest, and that no one makes a slower slow jam CD. Practice this until you’re willing to practice therapy skills with a telemarketer.

Denial

I had a neighbor with schizophrenia. He’d lost his job as a chemical engineer and now worked as a minimum wage security guard. He’d never asked a woman out on a date since the voices in his head started. He had no friends other than me.

Like 40% of people with schizophrenia, he denied that he had the disorder. He was convinced that when he’d gone in for a root canal, the dentist had inserted a radio receiver in his tooth, and now the CIA was broadcasting voices into his head.

My neighbor enjoyed reading French and Italian newspapers at a university library. He’d take the newspapers to the basement where no one would hear him repeating obscenities to annoy the CIA agents listening to his thoughts. One day, security guards asked him to leave. To get away from them he ran into traffic in a busy street. He wasn’t allowed into the library after that.

Consider what would have happened if he’d told a librarian that he had a mental illness that made him talk to himself, and asked if there was somewhere he could read the newspapers without disturbing anyone. The librarian would have unlocked a conference room for him to use.

Denying that he had schizophrenia took effort. His life would have been simpler if he admitted that he had the disorder. *If you put more effort into denying that you have a disorder than the treatment would demand, then you have a denial problem.*

He asked me whether I thought he was crazy. I said, “You’re crazy if you deny that you have a mental illness. If you admit it, then you’re not crazy.”

You might think that people who are in denial are lazy bums,

but look again. My neighbor worked hard, almost every minute of the day, to refuse to believe that he had schizophrenia.

Stutterers who are in denial work harder than stutterers who are open about their stuttering. For example, saying “the great American pastime” instead of “baseball.” That’s eight syllables instead of two, and some listeners won’t know what you’re talking about.

The Most Important Aspect of Your Life

Let me tell you about an accountant I had dinner with. He worked for a local government. He kept pen and paper next to his bed because he’d wake up with ideas of how to solve accounting problems at work.

My first thought was, this guy needs a life! He dreams about accounting!

Then I thought, he thinks about accounting 24/7. He must be a good accountant. When I need an accountant I’ll hire him.

Until I was 22 and saw myself on video, I was unaware how severely I stuttered. I thought that I had a minor speech problem. I tried to do everything that everyone else does. When I failed at things most people seemed to effortlessly achieve (e.g., finding a job, finding a girlfriend) I didn’t realize it was because talking to me was an excruciating experience for listeners. No one told me that. They just avoided me.

When I was 30 I realized that stuttering wasn’t something that I could compensate for by excelling at other things. Stuttering affected every aspect of my life. I changed the focus of my life. I thought about stuttering 24/7. I’d wake up with ideas for how to solve speech problems. Speech therapy changed from something I did two hours a week, to what I did all the time.

Whatever you focus on, you can achieve. It may take years of persistence but you will succeed. But you can only think about one thing 24/7. You don’t want to spend your life climbing a mountain, get to the top, then see that you climbed the wrong mountain.

Is stuttering the most important aspect of your life? If you’re a

severe stutterer, as I was, the answer may be yes. Focus on stuttering 24/7. Your speech will improve, and then everything else will fall into place. For example, your speech improves, then your boss gives you a promotion. Then the pretty blonde at the photo store wants to be your girlfriend. It happened to me, and it'll happen to you. Read more stories like this in the chapter "Famous People Who Stutter" (page 165).

But if you're a mild stutterer, stuttering might be the wrong mountain for you to climb. You might be focusing your energy on stuttering, when listeners don't care whether you stutter (page 193). They might even like hearing you stutter mildly. Your life isn't going to change until you focus your energy elsewhere.

Freedom to Speak—Badly

I found this in the book *How to Learn Any Language*:

Americans, however, hold one high card that too frequently goes unplayed. We're gregarious. We're extroverts. Some say it contemptuously. Some say it admiringly. But those who know us best agree that we Americans are the only people in the world who enjoy speaking another language badly!

Most people in the world are shy, embarrassed, even paralyzed when it comes to letting themselves be heard in languages they speak less than fluently. An American may master a foreign language to the point where he considers himself fluent. A European, however, who speaks a language equally well and no better will often deny he speaks it at all!²³⁴

Are you an American—happy to talk even when your speech isn't good? Or are you a European—"shy, embarrassed, even paralyzed" when you can't speak fluently?

The First Amendment is freedom of *speech*. Generations of Americans have fought for that right. Stick an American flag pin in your lapel and go out and speak—badly, if you have to.

I found this in an article about Li Yang, the most successful English teacher in China:

He pleads with students to “love losing face....You have to make a lot of mistakes. You have to be laughed at by a lot of people. But that doesn't matter, because your future is totally different from other people's futures.”²³⁵

Change Your Lifestyle to Talk More

Ask your supervisor to give you work requiring talking. This could be talking to customers, or calling suppliers, or training other employees.

Or change careers to a job that requires talking. A friend bought an Edinburgh Masker (a 1980s anti-stuttering device, page 66), quit his job as a back room accountant at a bank, then worked at the Chicago Board of Trade, yelling orders to buy and sell soybean futures. Now he's a law school professor.

Or find a volunteer service requiring talking. Hospitals have information booths where volunteers direct visitors to their floors. Public television stations need volunteers to answer the phones during pledge drives.

Political groups need canvassers to collect signatures on petitions. Pick a cause you believe in. Imagine yourself standing on a busy street corner, talking to passersby about an important issue. Can you picture anything more American?

And compliment people. Don't limit this to attractive, single persons. Make everyone you meet feel good about themselves. Compliment old men, women pushing strollers in the park, the person behind you in the supermarket line, and your in-laws.

Compliment the person's smile. Then smile. This will make the person smile. Add a little joke such as, “Give my compliments to your orthodontist.”

Compliment the person's eyes. This reminds you to make eye contact. Look into the person's eyes long enough to mentally note his or her eye color.

Compliment the person's name. This helps you remember the

person's name. Ask how his or her name is spelled (e.g., Rebecca vs. Rebekah), the ethnic origin, or the meaning of the name. Read a history of your area to learn the names of local heroes and historical figures.

Listen for extraordinary things people have done, then reflect this back to them. Everyone thinks that their lives are ordinary. For example, a man who flies jet fighters thinks of himself as an ordinary fighter pilot. Make people feel special and they'll like you whether you stutter or not.

Or tell stuttering jokes. Here's my favorite:

A stutterer goes away to a two-week intensive speech therapy course on the East Coast. When he returns, his friends ask how it went.

The stutterer pauses, takes a deep breath, and slowly says, "Peter Piper picked a peck of pickled peppers."

His friends are amazed. "You said that completely fluently!" they say.

The stutterer says, "Y-y-yeah b-b-but it's, it's h-h-hard t-t-to w-w-work th-that in-t-to a, a c-c-conversation."



Speech-Related Fears and Anxieties

In 1928, a Freudian psychologist advanced a theory that stuttering was an attempt to satisfy unresolved oral-erotic needs.²¹² If this were true, there would be stuttering phone sex lines. Imagine finding ads in the back of *Playboy* magazine with scantily dressed women saying, “Call me! I stutter!”

A 1939 personality test study found that stutterers were more neurotic, more introverted, less dominant, less self-confident, and less sociable than non-stutterers.²¹³ Examination of the personality test found sixteen speech-related questions, including “If you are dining out do you prefer someone else to order dinner for you?” The psychologists had interpreted stutterers’ reluctance to order in restaurants as evidence of neuroses, rather than as difficulty talking.

A 1952 study of hostility and aggression found stutterers more likely to turn hostility inward. A 1953 study found the opposite.²¹⁴

Other psychological studies found no difference between stutterers and non-stutterers for self-concept, levels of aspiration, body images, role perception, handwriting, social maturity, birth order, exaggerated fears, sleep disturbances, hyperactivity, temper tantrums, thumb sucking, and nail biting.²¹⁵

Stutterers are, on average, psychologically normal, except for speech-related fears and anxieties. We generally have the same speech-related fears and anxieties as non-stutterers, such as fear of talking to strangers and fear of speaking to an audience, but these fears are greater in stutterers.

Hiding Stuttering, Avoiding Speaking

How do we hide stuttering? Let us count the ways.²¹⁶

Stutterers will drive an hour to see if a store has an item, to

avoid a one-minute telephone call to ask if the store has the item.*

I received a call from a woman who was considering divorce. Her husband was a stutterer, and had requested and received a demotion to a job that required no talking to anyone. He'd stopped talking to his wife and children and no longer socialized with friends.

I received a call from an army colonel who was able to completely hide his stuttering by substituting words. But in presentations and he couldn't read his PowerPoint slides aloud. If he read the text as written, he stuttered. If he substituted words, he appeared to be illiterate.

At a stuttering convention I listened to a man complain about the fluency shaping therapy program he'd attended. "They wanted me to talk like this!" he said, perfectly fluently. He thought that the relaxed, easy speech sounded weird. He said, "I've worked with the same guys for ten years. What would they think if I came to work one day talking like that?"

Being shy about talking to strangers is normal. Feeling embarrassed when you stutter, especially if a listener reacts negatively, is normal. But when hiding and avoiding stuttering causes you to behave abnormally, you don't have a stuttering problem. You have a hiding stuttering problem.

The Iowa Therapies

The first modern treatments for stuttering aimed to reduce hiding and avoidance. In 1927 Lee Edward Travis became the first director of the University of Iowa Speech Clinic.²¹⁷ Travis had a personal interest in stuttering and encouraged three of his students to conduct research and develop new treatments for the disorder.

* On the other hand, some of the "urban legends" about avoidance leave me skeptical. No stutterer has ever told me that in restaurants he orders foods he didn't like, because he could say, for example, "liverwurst" or "anchovies."

the new therapeutic approach for which [Bryng] Bryngelson, [Wendell] Johnson, and [Charles] Van Riper opened the way was aimed at a reduction in the fear and avoidance of stuttering...This approach represented a sharp departure from the philosophy on which the older methods were based. Bryngelson, Johnson, and Van Riper were severely critical of those methods...such methods served in the long run to intensify rather than decrease fear because in effect they said to the stutterer, "Don't stutter. Swing your arms or talk in some odd and unnatural way, but whatever you do, don't stutter." And the implication was that hardly anything was more unusual or grotesque or more to be feared and avoided than stuttering. By contrast, the new approach was to say to the stutterer, "Go ahead and stutter. But learn to do so without fear and embarrassment and with a minimum of abnormality."²¹⁸

Bryngelson: Voluntary Stuttering

The first of Travis's students, Bryng Bryngelson, who was not a stutterer, encouraged stutterers to develop an "objective attitude," including

the ability to discuss their stuttering freely and casually with others. It meant the willingness to enter difficult speech situations and the refusal to make use of word substitutions or other tricks for avoiding stuttering. In general, the goal was to bring the problem out into the open and to be willing to stutter. This lent itself to the use of group therapy in which people who stutter were encouraged to ventilate their feelings about their speech problem...It also led to a great emphasis on "situational" work in which clients were taken outside the speech clinic and challenged to demonstrate their ability to maintain an objective attitude in feared situations...the teaching of an objective attitude through situational work is today still used by many speech pathologists [to treat adult stutterers].²¹⁹

A particularly distinctive contribution that Bryngelson made...was a technique he termed "voluntary stutter-

ing.”...If attempts to stutter voluntarily on a difficult word resulted in an involuntary reaction [i.e., real stuttering], clients were to repeat the attempt until the block was completely under their control. In principle, Bryngelson advocated that stutterers learn to imitate...their own...stuttering behavior, but he found that it was easier for stutterers to stutter on purpose when they produced a simple, effortless repetition of initial sounds.²²⁰

Voluntary stuttering is still taught today.²²¹ But note that Bryngelson’s clients changed voluntary stuttering from imitating their own stuttering behavior, to instead doing “simple, effortless” repetitions. Relaxed, effortless repetitions are a strategy to produce slow, relaxed speech motor movements. While this might be somewhat effective, fluency shaping therapy (page 80) is more effective for this goal. A recent article highlights this point:

When using voluntary stuttering for desensitization purposes, the speaker should stutter in a clearly noticeable or “hard” manner so it is clear that he or she is a stutterer. In other words, the speaker should not “cheat” the situation by stuttering softly or in a subtle manner. The speaker also may consider using voluntary secondaries as well, such as voluntary eye blinking and voluntary head movements.²²²

Johnson: Perceptual and Evaluative Reorientation

Travis’s second student, Wendell Johnson, focused even more closely on fear of stuttering.²²³ Johnson believed that stuttering was caused by the fear of stuttering, even in young children, and this became his *diagnosogenic theory*.

Johnson is best known for developing *indirect therapy* (page 33) for children who stutter, but he also developed treatment for adult stutterers.

Clients carefully observed their stuttering behavior before a mirror and by means of tape recording to determine just what they did to prevent themselves from

speaking...They observed the disfluencies of normal speakers in order to discover that normally fluent speech was not perfectly fluent speech. They made scientific observations of the reactions of their listeners to find out, by and large, listeners were more tolerant of their stuttering than they had assumed.

[In his later years he focused on] training stutterers to be conscious of the inappropriateness of the language they tended to use in talking about their problem...individuals who came for treatment were taught to examine carefully what they meant when they referred to themselves as “stutterers,” as though assuming that there was something about them that marked them as basically different from other people, or when they referred to what they did when they talked as their “stuttering” or “it” as though their problem was not what they did when they talked, but a think inside of them that they needed to manage, stop, or control.

Finally...Johnson proceeded to place major emphasis on a great deal of actual speaking by stutterers—an increase both in speaking time and in the number of situations in which speech was attempted—with attention to “going ahead and talking” on the assumption that there were no basic physical or emotional reasons for not doing so.²²⁴

Van Riper: Stuttering Modification Therapy

Travis’s third student went on to have the most influence of any speech-language pathologist in the field of stuttering. Charles Van Riper developed his therapy between 1936 and 1958.²²⁵ His therapy continued Bryngelson’s and Johnson’s focus on reducing the fears and anxieties of adult stutterers,²²⁶ but then added methods to modify stuttering’s core behaviors to be less physically stressful. His therapy is one of the most widely practiced stuttering treatments today.

Stuttering modification therapy has four phases: identification, desensitization, modification, and stabilization.

The *identification* phase is similar to Johnson’s clients observing their stuttering behaviors. You begin with identifying the core

behaviors, secondary behaviors, and feelings and attitudes that characterize your stuttering. The goal is to improve your awareness of what you do when you stutter. Next, your speech-language pathologist trains you to identify and become aware of your avoidance behaviors, postponement behaviors, starting behaviors, word and sound fears, situation fears, core stuttering behaviors, and escape behaviors. Finally, you identify feelings of frustration, shame, and hostility associated with your speech.

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therapy activities. Another sub-goal is “the automatization of preparatory sets and pull-outs.” The last subgoal, similar to Johnson’s semantic therapy, is for you to change your self-concept from being a person who stutters to being a person who speaks fluently most of the time but who occasionally stutters mildly.

Efficacy of Stuttering Modification Therapy

About a dozen studies have measured the efficacy of stuttering modification therapy.²²⁷ Most of these studies weren’t high quality, such as using stutterers’ self-reports of improvement without measuring stuttering, or counting the number of subjects who had improved speech but not saying how much their speech improved.

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"switch gears" to a self-approving position by giving oneself credit for any degree of progress made or trying to be made rather than yielding to all the familiar negative and self-defeating thoughts which tend to overwhelm any degree of success.²³⁰

Change and acceptance work together. When my speech was

out of control, I tried to ignore my stuttering (see “Denial,” page 160). But when I developed *some* fluency, I wanted to tell my friends what I’d done. My friends’ positive responses made me feel *some* acceptance that I stuttered. Acceptance helped me work more to improve my speech, and improved speech gave me more acceptance. Change and acceptance work together, in a “virtuous” circle.

In contrast, change without acceptance doesn’t work, and acceptance without change doesn’t work. The former individuals seek instant, effortless, invisible, 100% miracle cures. They don’t want anyone to know that they went to speech therapy or are wearing an anti-stuttering device. These are the people who want anti-stuttering medications.

The latter individuals go to National Stuttering Association conventions. I went to three conventions and then stopped going. I wanted to talk about stuttering treatments, while everyone else was heartily accepting each other as they were.

Are Clinicians Responsible for Clients’ Speech?

Speech-language pathologists have a parallel issue. Catherine Montgomery, CCC/SLP, of the American Institute for Stuttering in New York City, wrote of her experiences:

I had been taught as a young clinician that my clients’ progress was pretty much 100% my responsibility. This created my burn out and a neediness on my part for them to do well. If they did well, then I was OK. It meant I was a good clinician. This sense of neediness undoubtedly set up a dynamic in the clinical relationship that was not healthy for me or for them.

I now believe that for most of our clients who stutter, from school age on up, that one of our primary jobs is to facilitate their independence and empowerment. Thankfully, I learned how to let go. I now know to develop a partnership attitude with each client, that I am here to do the very best I know to do for and with them, but that there has to be a point where I step back and let them

take over. You know, “you can take the horse to the water...”²³¹

Locus of Control

Barry Yeoman, a long-time member of the National Stuttering Association, wrote in the magazine *Psychology Today* that “achieving fluency...is nearly impossible” and “stuttering is a physical impediment for which little can be done.”²³²

Locus of control is associated with assignment of causality of a given condition. A person with an *external locus of control* sees stuttering as something that happens to him, and therapy as something that a speech-language pathologist does to him. Barry Yeoman has an external locus of control regarding his stuttering.

In contrast, a person with an *internal locus of control* sees stuttering and stuttering therapy as something that he does and has at least some control over. An individual who says, “I can beat stuttering if I try hard harder” has an internal locus of control.

A study found that internal vs. external locus of control did *not* predict fluency two years after completing a stuttering therapy program.²³³ However, that study only examined one stuttering treatment (a fluency shaping therapy program). It’s possible that different stuttering treatments are more effective for persons with internal vs. external loci of control. E.g., if you have an external locus of control, you might do better with anti-stuttering medications or another treatment that does something to you. If you have an internal locus of control, you might get better results from stuttering modification therapy or another therapy that you do for yourself.

If you say, “I’ve been to stuttering therapy, I just have to remember to use my therapy skills” then you’re headed for an internal locus of control trap. You may be blind to people who could help you, e.g., you refuse to join a stuttering support group; or blind to other stuttering treatments, e.g., your state offers to give you a free anti-stuttering telephone.

An external locus of control trap is to try a stuttering treatment, it doesn't work, and you give up and conclude that no stuttering treatment works. Consider why crazy weight-loss diets attract customers. People try the "pizza and ice cream" diet, it doesn't work, and then say that they tried to lose weight but the diet didn't work. Therefore no diet or exercise plan will ever work and they have an excuse to be overweight. These people chose the fad diet instead of the salads and running ten miles a day diet because they knew it wouldn't work.

Inward vs. Outward Anger

Stuttering, like any frustrating experience, causes anger. Some individuals direct these feelings inward (i.e., they hate themselves). This leads to a vicious cycle or "self-fulfilling prophecy" of failure.

But other stutterers direct these feelings outward. These individuals feel anger at other people. Their relationships at work or socially go poorly, again creating a vicious cycle of failure.

How do you feel when people disrespect you when you stutter? Do you feel anger at yourself for stuttering? Or do you feel anger at the person who treated you poorly?

When you're angry, do you do nothing, but get angrier inside? That's inner-directed self-hatred.

Or do you take action to "send a message" nonverbally—which the other person is certain to misunderstand? I once "sent a message" to my housemates that it was their turn to buy toilet paper. Don't ask me what I did! They didn't get the message. They just got angry back at me. That didn't lead to domestic bliss.

Earlier I suggested that you use slow, stretched syllables when telemarketers call (page 118). Do you look forward to annoying telemarketers? If so, you direct your anger outward. But if you're afraid to annoy telemarketers, then you direct your anger inward.

If practicing speech therapy with a telemarketer scares you, have your speech-language pathologist pretend to call you. She'll try to sell you slow pitch bats, slow blow fuses, stainless steel slow cookers, and slow jam CDs. If you can't think of anything to say, ask,

“How slow are the slow pitch bats?”

Then call her, reversing roles. Convince her that your slow cookers are the slowest, and that no one makes a slower slow jam CD. Practice this until you’re willing to practice therapy skills with a telemarketer.

Denial

I had a neighbor with schizophrenia. He’d lost his job as a chemical engineer and now worked as a minimum wage security guard. He’d never asked a woman out on a date since the voices in his head started. He had no friends other than me.

Like 40% of people with schizophrenia, he denied that he had the disorder. He was convinced that when he’d gone in for a root canal, the dentist had inserted a radio receiver in his tooth, and now the CIA was broadcasting voices into his head.

My neighbor enjoyed reading French and Italian newspapers at a university library. He’d take the newspapers to the basement where no one would hear him repeating obscenities to annoy the CIA agents listening to his thoughts. One day, security guards asked him to leave. To get away from them he ran into traffic in a busy street. He wasn’t allowed into the library after that.

Consider what would have happened if he’d told a librarian that he had a mental illness that made him talk to himself, and asked if there was somewhere he could read the newspapers without disturbing anyone. The librarian would have unlocked a conference room for him to use.

Denying that he had schizophrenia took effort. His life would have been simpler if he admitted that he had the disorder. *If you put more effort into denying that you have a disorder than the treatment would demand, then you have a denial problem.*

He asked me whether I thought he was crazy. I said, “You’re crazy if you deny that you have a mental illness. If you admit it, then you’re not crazy.”

You might think that people who are in denial are lazy bums,

but look again. My neighbor worked hard, almost every minute of the day, to refuse to believe that he had schizophrenia.

Stutterers who are in denial work harder than stutterers who are open about their stuttering. For example, saying “the great American pastime” instead of “baseball.” That’s eight syllables instead of two, and some listeners won’t know what you’re talking about.

The Most Important Aspect of Your Life

Let me tell you about an accountant I had dinner with. He worked for a local government. He kept pen and paper next to his bed because he’d wake up with ideas of how to solve accounting problems at work.

My first thought was, this guy needs a life! He dreams about accounting!

Then I thought, he thinks about accounting 24/7. He must be a good accountant. When I need an accountant I’ll hire him.

Until I was 22 and saw myself on video, I was unaware how severely I stuttered. I thought that I had a minor speech problem. I tried to do everything that everyone else does. When I failed at things most people seemed to effortlessly achieve (e.g., finding a job, finding a girlfriend) I didn’t realize it was because talking to me was an excruciating experience for listeners. No one told me that. They just avoided me.

When I was 30 I realized that stuttering wasn’t something that I could compensate for by excelling at other things. Stuttering affected every aspect of my life. I changed the focus of my life. I thought about stuttering 24/7. I’d wake up with ideas for how to solve speech problems. Speech therapy changed from something I did two hours a week, to what I did all the time.

Whatever you focus on, you can achieve. It may take years of persistence but you will succeed. But you can only think about one thing 24/7. You don’t want to spend your life climbing a mountain, get to the top, then see that you climbed the wrong mountain.

Is stuttering the most important aspect of your life? If you’re a

severe stutterer, as I was, the answer may be yes. Focus on stuttering 24/7. Your speech will improve, and then everything else will fall into place. For example, your speech improves, then your boss gives you a promotion. Then the pretty blonde at the photo store wants to be your girlfriend. It happened to me, and it'll happen to you. Read more stories like this in the chapter "Famous People Who Stutter" (page 165).

But if you're a mild stutterer, stuttering might be the wrong mountain for you to climb. You might be focusing your energy on stuttering, when listeners don't care whether you stutter (page 193). They might even like hearing you stutter mildly. Your life isn't going to change until you focus your energy elsewhere.

Freedom to Speak—Badly

I found this in the book *How to Learn Any Language*:

Americans, however, hold one high card that too frequently goes unplayed. We're gregarious. We're extroverts. Some say it contemptuously. Some say it admiringly. But those who know us best agree that we Americans are the only people in the world who enjoy speaking another language badly!

Most people in the world are shy, embarrassed, even paralyzed when it comes to letting themselves be heard in languages they speak less than fluently. An American may master a foreign language to the point where he considers himself fluent. A European, however, who speaks a language equally well and no better will often deny he speaks it at all!²³⁴

Are you an American—happy to talk even when your speech isn't good? Or are you a European—"shy, embarrassed, even paralyzed" when you can't speak fluently?

The First Amendment is freedom of *speech*. Generations of Americans have fought for that right. Stick an American flag pin in your lapel and go out and speak—badly, if you have to.

I found this in an article about Li Yang, the most successful English teacher in China:

He pleads with students to “love losing face....You have to make a lot of mistakes. You have to be laughed at by a lot of people. But that doesn't matter, because your future is totally different from other people's futures.”²³⁵

Change Your Lifestyle to Talk More

Ask your supervisor to give you work requiring talking. This could be talking to customers, or calling suppliers, or training other employees.

Or change careers to a job that requires talking. A friend bought an Edinburgh Masker (a 1980s anti-stuttering device, page 66), quit his job as a back room accountant at a bank, then worked at the Chicago Board of Trade, yelling orders to buy and sell soybean futures. Now he's a law school professor.

Or find a volunteer service requiring talking. Hospitals have information booths where volunteers direct visitors to their floors. Public television stations need volunteers to answer the phones during pledge drives.

Political groups need canvassers to collect signatures on petitions. Pick a cause you believe in. Imagine yourself standing on a busy street corner, talking to passersby about an important issue. Can you picture anything more American?

And compliment people. Don't limit this to attractive, single persons. Make everyone you meet feel good about themselves. Compliment old men, women pushing strollers in the park, the person behind you in the supermarket line, and your in-laws.

Compliment the person's smile. Then smile. This will make the person smile. Add a little joke such as, “Give my compliments to your orthodontist.”

Compliment the person's eyes. This reminds you to make eye contact. Look into the person's eyes long enough to mentally note his or her eye color.

Compliment the person's name. This helps you remember the

person's name. Ask how his or her name is spelled (e.g., Rebecca vs. Rebekah), the ethnic origin, or the meaning of the name. Read a history of your area to learn the names of local heroes and historical figures.

Listen for extraordinary things people have done, then reflect this back to them. Everyone thinks that their lives are ordinary. For example, a man who flies jet fighters thinks of himself as an ordinary fighter pilot. Make people feel special and they'll like you whether you stutter or not.

Or tell stuttering jokes. Here's my favorite:

A stutterer goes away to a two-week intensive speech therapy course on the East Coast. When he returns, his friends ask how it went.

The stutterer pauses, takes a deep breath, and slowly says, "Peter Piper picked a peck of pickled peppers."

His friends are amazed. "You said that completely fluently!" they say.

The stutterer says, "Y-y-yeah b-b-but it's, it's h-h-hard t-t-to w-w-work th-that in-t-to a, a c-c-conversation."



Famous People Who Stutter

Stuttering is a difficult and demoralizing disability, but with persistence many stutterers overcome the disorder and go on to lead successful lives.

Singers and Actors

Some stutterers are afraid to open their mouths. But other stutterers earn their living with their voices.

Carly Simon, Singer-Songwriter

Carly Simon (1945-) began stuttering severely when she was eight years old. She blames her stuttering on her then 44-year-old mother's affair with their 20-year-old live-in tennis instructor. The affair caused jealousy, anger, "lies and a train of deception" in the Simons' affluent household.

A psychiatrist tried unsuccessfully to cure Simon's stuttering. Instead, Simon turned to singing and songwriting. "I felt so strangled talking that I did the natural thing, which is to write songs, because I could sing without stammering, as all stammerers can."²³⁶

Simon wrote some of the most-loved songs of the 1970s, including "Anticipation" and "You're So Vain." She won an Oscar and a Grammy. She was married to James Taylor for nine years. They have two children.

Mel Tillis, Country Music Entertainer

As a child, Mel Tillis (1932-), was laughed at because he stuttered.²³⁷ He said to himself, "Well, if they're gonna laugh at me, then I'll give them something to laugh about."

In 1957 he began working as a singer for Minnie Pearl, Nashville's great country comedienne. Pearl encouraged Tillis to talk on

stage, but he refused, afraid that he'd be laughed at.

Pearl replied, "Let 'em laugh. Goodness gracious, laughs are hard to get and I'm sure that they're laughing with you and not against you, Melvin."

Little by little, Tillis increased his speaking on-stage. He developed humorous routines about his stuttering. Then "word began to circulate around Nashville about this young singer from Florida who could write songs and sing, but stuttered like hell when he tried to talk. The next thing I knew I was being asked to be on every major television show in America." Tillis' career took off.

But before Nashville and fame and fortune, Tillis was looking for a job in Florida. No one hired him. At the last place he applied, the owner said that he had once stuttered. He wouldn't hire Tillis, but gave him a piece of paper to read every night, saying that it had changed his life.

On the paper was a prayer:

Oh Lord, Grant me the Courage to change the things I
can change, the Serenity to accept those I cannot
change, and the Wisdom to know the difference. And
God, Grant me the Courage to not give up on what I
think is right, even though I think it is hopeless.

Tillis concludes his story,

For the first time in a long time, I slept well that night. I woke the next morning with a different outlook on life. I told myself that if I couldn't quit stuttering, then the world was going to have to take me like I was. What you see is what you get. From that day on, things started looking up for Mel Tillis. Soon after, I headed for Nashville in a '49 Mercury with a wife and a four-month-old baby girl—her name was Pam.

Tillis was 1976 Country Music Entertainer of the Year.

James Earl Jones, Actor

James Earl Jones (1931-), the most in-demand voice in Hollywood, is a stutterer.

Jones was “virtually mute” as a child.²³⁸ With the help of his high school English teacher, Jones overcame stuttering by reading Shakespeare “aloud in the fields to myself,” and then reading to audiences, and then acting.

Jones is proudest of his role as Shakespeare’s *Othello*, but is best-known as the voice of Darth Vader in *Star Wars*. He portrayed a stutterer in the movie *A Family Thing* (1995).

Peter Bonerz, Director

Peter Bonerz (1938-), who played Jerry the dentist on *The Bob Newhart Show*, and directed *Friends*, *Murphy Brown*, and *Home Improvement*, said about his stuttering:²³⁹

I’m 58 years old, and if I stutter while giving Candice Bergen a direction, who cares? If (the stuttering) is really difficult, I exaggerate it and get everyone on the set to laugh with me. A stutter can really be quite charming. We are human and not perfect.

Athletes

Some stutterers compensate for their speech difficulties by excelling at non-verbal activities, such as sports. But you’ll see that top athletes must do more than score points in a game.

Bob Love, Basketball Player

Bob Love (1942-) was a three-time NBA All-Star and led the Chicago Bulls in scoring for seven consecutive seasons. Reporters rarely interviewed him. “I would score 45 points, go into the locker room, and all the reporters would come down,” Love recalls. “Everybody would pass me by.”

Love retired in 1977. Because of his stuttering he went from one dead-end job to another. The low point was in 1985, at the age of

42, when a restaurant hired Love as a \$4.45/hour busboy. Love had tried speech therapy twice before without success. He tried again. After a year of stuttering therapy, Love began public speaking. As a boy, he had a dream of standing on a podium, speaking to thousands of people. Love gave motivational speeches to churches, high school students, and other groups. He's now director of community relations and spokesman for the Bulls. "It's hard to believe I make a living speaking. It's a dream come true. I held onto my dreams, and I tell kids they have to hold on to theirs."²⁴⁰

Bill Walton, Basketball Player

Bill Walton (1952-) led UCLA to two NCAA titles, and the Portland Trailblazers and Boston Celtics to NBA championships. His stuttering was so severe that he couldn't say simple phrases like "thank you."

Today, Walton has overcome his stuttering and works as a sports commentator for NBC Sports.

As Walton was battling stuttering through childhood, college, and his professional career, he used basketball as a sanctuary, a place where he didn't have to think about his speech. The challenges in his personal life pushed him to become one of the best players on the court.

Amazingly, on the court, he could not only play ball, he could speak, too. Or at least yell. "I never had any trouble yelling at the refs," Walton said. "In the heat of the game...when it was just totally spontaneous, I could get out there and really scream and yell at the refs. But it was only in basketball, and it was only at the refs."

When each game ended, Walton stuttered again.

"During college, the teasing was tough," he said. "I had a speech class one year, and they laughed me out of the class." It didn't matter to his classmates that he was the college basketball Player of the Year. "I was trying to make it in school, and they just laughed me out of the class."

At awards ceremonies and media events, Walton shied away from microphones. He even had other people speak on his behalf.

“When I had to actually formulate words and make a statement, I could not do it at all,” he recalls.

In the NBA, he faced some of the toughest and most legendary players in the history of the game. Playing basketball with Kareem Abdul-Jabbar and Larry Bird came naturally. Speaking did not.

After he retired from basketball, the sanctuary was gone. The hiding place that had protected him for 28 years could shelter him no longer. But his love for the game helped him with stuttering.

According to Walton, long-time friend and Hall of Fame broadcaster Marty Glickman pulled him aside at a social event and said, “You’ve got to learn how to talk.”

“He gave me some very basic tips, and I applied those tips to the learning techniques I learned from my coach at UCLA John Wooden about how to develop as a basketball player,” Walton explained. “I thought about fundamentals and how to start with the basics like the ability to mechanically duplicate moves on the basketball court. And I just applied that to speaking.”

So Walton learned to speak, just as he had learned basketball years before. Not only did he stop stuttering, he found a way back—through sports commentating—to the game he loved so much.

When he began broadcasting for NBC Sports, his fears resurfaced. Off the court, he was still afraid to talk. He describes his first broadcast as “painful” but knows now that the worst is over. “I used to be really embarrassed about stuttering. But now I realize that it’s something that is a part of me...something that I have to deal with and work on every day. If I don’t work on it, I’m not going to be able to do my job. It’s always a challenge,” Walton said. He doesn’t mind the challenge—that’s what makes him strive to do his best.

Walton challenges others to get on top of stuttering too. “It’s important to know that help is out there. The ability to learn how to talk is easily the greatest thing I’ve ever done. Winning two NCAA championships and two NBA titles was nice, but I knew it was going to happen. But learning how to speak has given me a whole new life. I have been set free.”²⁴¹

Bo Jackson

Baseball and football pro Bo Jackson (1962-) wrote:

My teachers thought I couldn't read. I could read, but I'd never read aloud because I stuttered. The other kids would laugh at me, and I became a recluse. I was angry at myself and at them, and it often resulted in my beating someone up after school. I had to live with it for eight or nine years, but I finally decided to pay it no attention and forced myself to do everything from reading in class to making speeches. Eventually, I learned to relax and take my time.²⁴²

Writers and Photographers

Essayist Thomas Carlyle wrote of novelist and stutterer Henry James (1843-1916), author of *Portrait of a Lady* and *Turn of the Screw*: "A stammering man is never a worthless one...It is an excess of delicacy, excess of sensibility to the presence of his fellow-creature, that makes him stammer."²⁴³

Contemporary fiction authors who stutter include horror writer Peter Straub²⁴⁴ (1943- ; *Shadowland*, *Ghost Story*); mystery writer Paul Johnson (*Killing The Blues*),²⁴⁵ and David Shields (*Dead Languages* includes a funny short story about his childhood experiences in school speech therapy). John Updike (1932- ; the *Rabbit* series, *Brazil*) believes that his stuttering is precipitated when "I feel myself in a false position," such as guilt of being "in the wrong."²⁴⁶

Nature writer and editor Edward Hoagland (*The Snow Leopard*) not only stutters, but was blind for several years. He wrote of this experience in *Tigers & Ice*. Zoologist Alan Rabinowitz's book *Beyond The Last Village* (2002) recounts his explorations in Asia searching for endangered wildlife, and his experiences stuttering.²⁴⁷

Benson Bobrick has written popular histories of the English Bible, the American Revolution, Russia and Siberia, and a history of stuttering, *Knotted Tongues* (1995).

Marty Jezer (died 2005) wrote a history of the 1950s, biographies of Abbie Hoffman and Rachel Carson, and an autobiography, *Stuttering: A Life Bound Up In Words* (1997).

Publishers who stutter include Henry Luce (1898-1967), founder of *Time* magazine and *Sports Illustrated*; and Walter Annenberg (1908-2002), founder of *TV Guide* and *Seventeen*. In 1993, Annenberg donated \$500 million to improve American schools.²⁴⁸

Photographers

Howard Bingham, friend of Muhammed Ali and O.J. Simpson, stuttered as a witness in Simpson's trial. Growing up, Bingham "endured the usual teasing from schoolmates because of his stuttering. In high school...he hid behind his stuttering and didn't volunteer for anything."

Bingham's friendship with Muhammed Ali began in 1962, continued through photographing the Black Panther Party and "virtually every significant urban uprising" in the 1960s. Bingham later worked as Bill Cosby's photographer. He wrote the book *Muhammed Ali: A Thirty Year Journey*, and worked for years to get his friend the honor of lighting the Olympic flame that started the 1996 Atlanta Games. Ironically, Bingham now sometimes has to talk for Ali, due to Ali having Parkinson's disease.²⁴⁹

Political and Business Leaders and Scientists

Annie Glenn (1920-), wife of astronaut and Senator John Glenn, once refused to talk to President Johnson because of her stuttering.²⁵⁰

Representative Dennis Kucinich (1946-; D-Ohio) overcame stuttering as a child. Rep. Kucinich was elected mayor of Cleveland at the age of 31. As a state senator, he won the 1996 National Association for Social Workers Outstanding Senator of the Year Award. He also won an Emmy for his political analysis television broadcasts.²⁵¹

Other political leaders who stutter include Berkeley Free Speech leader Mario Savio²⁵² (1942–1996) and congressman Frank Wolf (1939– ; R-Virginia).²⁵³

Scientists

French Anderson (1930–) is known as the father of gene therapy and in 1995 was runner-up for *Time* magazine’s “Man of the Year” cover (losing the Newt Gingrich).²⁵⁴

Business Leaders

In the business world, John Sculley’s (1939–) stuttering “has taken him many years to overcome. He was also painfully shy.”

Sculley wrote in his autobiography, “I was determined to build a strength out of what was originally a weakness. I went to the theater to watch how performers positioned themselves on stage. I’d practice for hours. I became obsessed with the idea that I was going to become better than anyone else as a business communicator.”²⁵⁵

Sculley rose to president of Pepsi-Cola. He succeeded in overtaking Coca-Cola as the #1 soft drink. He then changed coasts and cultures to become president of Apple Computer for ten years. Sculley became a great public speaker, gaining “renown for his ability to deliver rousing speeches in front of thousands, sometimes without notes.”²⁵⁶

Sidney Gottlieb, CIA Spook

The man who brought us LSD was “a lifelong stutterer.” Sidney Gottlieb (1918–1999), described by friends as “a kind of genius,” had a Ph.D. in biochemistry from Caltech. He joined the CIA in 1951. In 1953 he founded the MKUltra program, which gave LSD to thousands of CIA agents, military officers, college students, prisoners, and mental patients. Many of the study participants were unknowingly dosed with the drug. Gottlieb took LSD hundreds of times.

Gottlieb’s later work at the CIA included developing “a poison

handkerchief to kill an Iraqi colonel, an array of toxic gifts to be delivered to Fidel Castro, and a poison dart to kill a leftist leader in the Congo. None of the plans succeeded.”

After leaving the CIA, Gottlieb became a speech-language pathologist, then raised goats on a commune in Virginia.²⁵⁷

Serial Killers

Not all stutterers are nice people. After examining a series of killings near San Francisco-area hiking trails in 1979, FBI psychological profiler John Douglas concluded that the Trailside Killer was a stutterer.

Most serial killers approach their victims in a social situation and talk the victims into getting into a car, such as picking up hitchhikers. But the Trailside Killer attacked women hiking alone. The Trailside Killer used a “blitz” attack to overpower and dominate his victims, suggesting that he was “someone with some condition he felt awkward or ashamed about” who overpowered and controlled women as “his way of overcoming this handicap.” But the power of the attack ruled out a physically-disabled killer. A “very homely” or disfigured individual would have been remembered by witnesses.

Douglas concluded that stuttering can make a strong man feel powerless, and was something the killer “could easily feel ashamed of or uncomfortable with...yet wouldn’t ‘stand out’ in a crowd. No one would know about it until he opened his mouth.”

One victim was a high school student working part-time at a bank. She had been “kind and sweet...to a regular customer with a severe stutter”—who had an incarceration record for sex crimes. 50-year-old industrial arts teacher David Carpenter was investigated and convicted of murdering eight women.²⁵⁸

In 1983, a seventeen-year-old prostitute in Anchorage, Alaska told police a fantastic story. A man had handcuffed her, taken her home, and raped and brutalized her. Then he took her to his

private airplane, telling her they were going to his remote cabin. She escaped and ran to the police.

Robert Hansen was in his mid-forties, married with two children, and managed a successful bakery. He owned an expensive home, as well as an airplane and mountain cabin. He was “short and slight, heavily pockmarked, and spoke with a severe stutter. [The FBI profiler] surmised that he had had severe skin problems as a teenager and, between that and the speech impediment, was probably teased or shunned by his [childhood] peers, particularly girls. So his self-esteem would have been low. That might have [explained] why he moved to Alaska [from Iowa, when he was 25] —the idea of a new start in a new frontier.”

Under attic floorboards police found a hunting rifle matching bullets that had killed four prostitutes, as well as “various items of cheap jewelry belonging to the victims...a drivers license and other ID cards from some of the dead women...[and] an aviation map marked with where he had left various bodies.” Other jewelry “trophies” he had given to his wife and daughter.²⁵⁹

Two murder/suicides strangely echoed each other. In 1993, John O’Brien asked members of his stuttering self-help group where the heart is located in a person’s chest. The next day he brought a handgun to the New York subway equipment facility where he worked. He killed a co-worker in the head and wounded his supervisor. O’Brien then killed himself with a shot to his heart.²⁶⁰

O’Brien stuttered severely. He had been denied a promotion because of his speech. Friends described O’Brien as “an unbelievably nice guy,” “quiet,” who “never bothered anyone.”

In 1999, Pierre Lebrun brought a high-powered hunting rifle to the Ottawa, Canada, city bus transit complex machine shop where he worked. He killed four co-workers and then killed himself. A suicide note listed many more co-workers that he disliked, and his pockets were full of ammunition, leading police to speculate that his gun jammed and prevented more killings.

Lebrun stuttered mildly. Lebrun’s mother reported, “He said a

group of people were harassing him—not only one person, but a group of people. That’s why he killed, that’s why he went there—to kill the people who harassed him.”

Lebrun’s cousin recalled teasing in school. “That was the only thing that bothered him. It didn’t bother him that he had the stutter; it bothered him that people would bug him about it.”²⁶¹

Lebrun had completed a four-month speech therapy program two years earlier. He was described as “a really nice guy,” “friendly,” and “quiet and well-mannered.”²⁶²

British Royalty and Commoners

Several British royals stuttered. Charles I (1600-1649) was king from 1625 until 1649, during the English Civil War. His inability to speak to Parliament “had an unfavorable influence on his affairs.” Charles lost the war and was executed. It didn’t help that he proclaimed that he was above the law: “a king and a subject are two plain different things.” His father, James I (1566-1625), was described as “having a tongue too big for his mouth”—possibly an articulation disorder.²⁶³

George VI (1895-1952) was king from 1937 until 1952. He was father of Queen Elizabeth II. His annual live Christmas broadcasts were “always an ordeal.”²⁶⁴ Robert Graves’ 1937 novel *I, Claudius* is ostensibly about the Roman emperor Claudius, who stuttered. But the personality and life of Graves’ Claudius were taken from the shy George VI. George survived the scandals of his brother Edward’s abdication, was thrust into a role to which he was thought unsuited, and surprised everyone by becoming one of the most capable and loved modern kings.

Winston Churchill and Aneurin Bevan, Statesmen

Sixty years ago the best orators of the British Parliament were both stutterers. Aneurin Bevan (1897-1960), leader of the Labour Party and architect of the National Health Service, forced himself to make speeches as often as possible. He spoke fluently when his

passions were aroused, so he spoke passionately for British workers in the 1930s. Bevan developed an extraordinary vocabulary by substituting words to avoid stuttering.²⁶⁵

Winston Churchill (1874-1965), leader of the Conservative Party, could speak fluently only by preparing his remarks in advance. He studied issues weeks in advance, and wrote out responses to any possible objection. This extra effort made Churchill more knowledgeable than other leaders.²⁶⁶

As a young man, Churchill worried that his stuttering would have an impact upon his ambition to go into politics. But he didn't believe in submitting to failure so he practiced and persevered. He both practiced his speeches and practiced nonsense phrases as he walked, such as "The Spanish ships I cannot see since they are not in sight." When he was 23, he wrote, "Sometimes a slight and not unpleasing stammer or impediment has been of some assistance in securing the attention of the audience..."²⁶⁷

More British Stutterers

The British are fond of eccentrics and stutterers.²⁶⁸

Erasmus Darwin (1731-1802) was a physician and naturalist and was invited to be the personal physician for King George III of England.²⁶⁹ His grandson, naturalist Charles Darwin (1809-1882), also stuttered.

Charles Canon Kingsley (1819-1875) was a Cambridge history professor, orator, and chaplain to Queen Victoria. His novels include the popular pirate adventure *Westward, Ho!* and the popular children's book *The Water-Babies*. He recommended treating stuttering with a "manly" diet of beef and beer.

Charles Lutwidge Dodgson (1832-1898) was an Oxford mathematician, minister, and photographer. On July 4, 1862, while boating on the Thames, he told a friend's children, including a daughter named Alice, a story of a girl named Alice. Dodgson later published *Alice's Adventures in Wonderland* under the pen name Lewis Carroll.

Somerset Maugham (1874-1965) was the highest-paid writer of

the 1930s. His novels include *The Razor's Edge* and *The Moon and Sixpence*. In his autobiographical novel *Of Human Bondage* he substituted a clubfoot for his stuttering, because stuttering was too difficult to transcribe in writing.

Lord David Cecil (1902-1986) was Professor of English literature at Oxford in the 1950s. "Lord David's stutter was thought of as a mark of high-bred diffidence...As an Oxford undergraduate in the fifties, I expected my tutors to stutter; it was their way of not *insisting*, I thought, and very Oxford." John Bailey, husband of novelist Iris Murdoch and another student of Lord David Cecil, also stutters.²⁷⁰

Kim Philby (1912-1988) was a spy. Stuttering once saved his life, by confounding a fast-paced interrogator.

Patrick Campbell (1913-1980) was a British humorist and 3rd Baron Glenavy. He wrote, "From my earliest days I have enjoyed an attractive impediment in my speech. I have never permitted the use of the word 'stammer.' I can't say it myself."²⁷¹

Margaret Drabble (1939-) is the editor of *The Oxford Companion to English Literature*. Her novels include *The Seven Sisters* and *The Red Queen*.

In the Ancient World

Stuttering is one of the few disorders that generally gets better over time. Most children who stutter outgrow it. Even adults who stutter severely in their teens and 20s often overcome stuttering—via speech therapy or on their own—in their 30s or 40s. At the life stage when other people experience the dreams of their youth crashing down, stutterers realize they can accomplish anything they want, regardless of their speech. Stutterers are less likely to be famous in their youth, and more likely to be famous five hundred years later.

Moses, Israelite Leader

Or five thousand years later. Moses stuttered:

But Moses said to the Lord, "Oh, my Lord, I am not eloquent, either heretofore or since thou hast spoken to thy servant; but I am slow of speech and of tongue."

Then the Lord said to him, "Who has made man's mouth? Who makes him dumb, or deaf, or seeing, or blind? Or who gives sight to one and makes another blind? Is it not I, the Lord? Now, therefore go, and I will be with your mouth and teach you what you shall speak."

But he said, "Oh, my Lord, send, I pray, some other person."

Then the anger of the Lord was kindled against Moses and he said, "Is there not Aaron, your brother, the Levite? I know that he can speak well; and behold, he is coming out to meet you, when he sees you he will be glad in his heart. And you shall speak to him and put the words in his mouth; and I will be with your mouth and with his mouth, and will teach you what you shall do. He shall speak for you to the people; and he shall be a mouth for you, and he shall be to him as God."²⁷²

Aesop, Master Storyteller

Aesop (620 to 560 BC) was born a slave and "most deformed" and "he coulde not speke." One day he fell asleep under a shady tree. The Goddess of Hospitality appeared to him in a dream and gave him the gift of speech. His life changed and he became a master storyteller.²⁷³

Demosthenes, Orator

Demosthenes (384 BC–322 BC) was the greatest orator of ancient Greece. He overcame stuttering by speaking with pebbles in his mouth to improve articulation, shouting above the ocean waves to improve his volume, and working with an actor in reciting Sophocles and Euripedes to coordinate his voice and gestures.²⁷⁴

Virgil, Poet

Publius Vergilius Maro (70 BC–19 BC), known in English as Virgil or Vergil, was a Roman poet. His works included the *Eclogues*, the *Georgics* and the *Aeneid*, the latter becoming the Roman Empire's

national epic poem.

Claudius, Emperor

Tiberius Claudius Caesar Augustus Germanicus (10 BC-AD 54), was the Roman Emperor from AD 41 to AD 54.

Claudius stuttered severely and was said to have weak hands and knees, although he was a tall, well-built man with no physical disability. His symptoms diminished after he became emperor. Claudius said that he'd exaggerated his weaknesses to avoid being murdered. By appearing to be weak and disabled, Claudius survived the deaths of rivals to the throne. He then served as one of the most effective and able emperors of Rome, for thirteen years.

Claudius' life was portrayed in Robert Graves' novel *I, Claudius* (1934), which was made into a television series in 1976.

Dekanawida, The Great Peacemaker

Dekanawida invented representative federal government. He united the Iroquois nations in what is now New York State, in the sixteenth century, before the Iroquois encountered Europeans.

The Iroquois federation was a model, thanks to Ben Franklin's experience making treaties with the Iroquois, for the Americans and French to create representative federal democracies.

The League of the Five Nations of the Iroquois was established, according to eighteenth-century sources, in the late sixteenth century. Iroquois tradition tells of constant warfare...One bereaved by this warfare was a Mohawk man, Hiawatha ("He Who Makes Rivers").

Crazed by grief for his murdered family, Hiawatha fled into the forests, living like a cannibal monster in the Iroquois myths. One day, Hiawatha met Dekanawida. The charismatic goodness of this man, said to have been a Huron miraculously born of a virgin, reawakened in Hiawatha his humanity.

Dekanawida confided to Hiawatha plans to free their peoples from the horrors of war by allying all the Iroquois in a grand league, a longhouse...in which [the

leader of] each Iroquois nation would sit as a brother with brothers.

The visionary felt himself unequal to the task of forming the league because he suffered a speech impediment. Hiawatha, however, was an imposing man with a fluent tongue. Together, in the time-honored fashion of a wise leader who relies on his executive assistant to make his speeches, Dekanawida and Hiawatha might be effective in restoring sanity and peace to their nations.

Hiawatha was inspired. Tirelessly, the two men traveled up and down the land...Hiawatha fervently preaching the alliance outlined by Dekanawida.

Most Iroquois were at first hesitant to trust a plan that contained their enemies. Thadodaho, an Onondaga leader, relentlessly opposed Hiawatha. In a dramatic showdown, Hiawatha's superior spiritual power overcame the evil Thadodaho. Hiawatha combed out of Thadodaho's hair the snakes that had marked him as a fearful sorcerer.

Then the five nations—Mohawk, Oneida, Onondaga, Cayuga, and Seneca—came together, fifty great chiefs meeting in a grand council at the principal town, in the center of the alliance territory.²⁷⁵

Each of these men and women found a way to overcome stuttering, and this became the basis of his or her success. For each, their disability became their strength—and perhaps each looks back and sees stuttering as a gift.



Stuttering Support Groups

Likely you've never met another stutterer. You've never seen a book about stuttering in a bookstore. You may be the first stutterer that your speech-language pathologist has met. You might feel that you're the only person in the world with this problem.

Last month your speech-language pathologist printed a web-page for you with the time and place of a stuttering support group. You put it off last month, but this month you go. You drive by the house. You see a group of people in the living room. You sit in your car, not sure if you have the courage to walk into the house.

Let's back up to how you find a stuttering support group. Call the National Stuttering Association at (800) 364-1677 or visit their website at <http://www.nsastutter.org/>. The NSA has more than 70 local support groups across the United States. Many stutterers say that the annual convention is the best experience of their lives.

Speak Easy International has stuttering support groups in the New York-New Jersey area. Call Bob Gathman, at (201) 262-0895.

The National Association of Young People Who Stutter (866 866-8335, <http://www.FriendsWhoStutter.org/>) has support groups for children and teenagers who stutter.

Some speech clinics have their own stuttering support groups. These are often for practicing therapy. Practicing in a group is better than practicing alone.

If you're outside the United States, find a stuttering support organization in your country by visiting the International Stuttering Association website at <http://www.stutterisa.org/>.

Then there are the online support groups. Yahoo Groups (<http://groups.yahoo.com/>) lists more than seventy stuttering e-mail lists. The Usenet discussion group is alt.support.stuttering.

The online support groups tend to be a few individuals who do

90% of the chatting, and hundreds of people who don't write anything. One individual used several e-mail addresses and fake names to have long arguments with himself. After that, I set up a free database website, <http://www.FriendshipCenter.com>, where you can search for stutterers who share your age, occupation, religion, marital status, live near you, or a dozen other parameters. You can find the one person you want to talk to, rather than shotgunning an e-mail list.

Benefits of Support Groups

Cancer patients who joined a support group, without receiving treatment, lived longer than patients who received treatment, without a support group. In other words, support groups were more effective than surgery, drugs, or radiation in fighting cancer.

A support group will help you learn what works for other people. You'll get feedback on what you're doing. A group of people will generate new ideas that no individual would have thought of.

In a support group, you'll find that you've solved problems that other people face. Other people may have solved problems you face. Stuttering will no longer seem like one big problem, but rather will become a set of small problems.

When you ask your support group how to solve a small problem (e.g., answering the telephone at work) they'll tell you. If your support group has six members, you'll get six solutions to your problem. At least.

A support group improves your emotional state. Hearing other people's experiences improves your perspective. Your setbacks don't seem so bad. Sharing positive experiences makes everyone in the group feel good.

When you feel frustrated or depressed, you have no idea what to do. Talking to individuals who've been in the same situation will help you see that you have choices (see the section "Personal Construct Therapy," page 144).

Support Group Activities

I was a National Stuttering Association chapter leader. Our meetings usually had a dozen people. We met twice a month. One monthly meeting would have a guest speaker or activity. The other monthly meeting would for “sharing” (talking about personal experiences).

Guests and activities included:

- A speech-language pathologist who stuttered and was the superintendent of 33 school districts and seven community colleges.
- A filmmaker who stuttered showed us the roughcut of his documentary about stuttering. We were the first audience to see the video.
- Local speech-language pathologists presented their approaches to stuttering therapy.
- A psychologist presented his mind-body-spirit approach to stuttering treatment.
- Another psychologist, who stuttered, and was an expert in marital counseling, conducted a workshop on improving communications in relationships.
- A National Stuttering Association board member presented a paper he’d written about his philosophy of stuttering.
- We watched a video about Tourette’s syndrome and discussed similarities to stuttering. (I was unable to find anyone with Tourette’s to join us for that meeting.)
- When I couldn’t find anyone else, I’d invite a Toastmasters International club. Those clubs always have three or four people happy to make a speech about overcoming fear of making speeches!
- Short speeches about “What I did this summer.”
- Reading Dr. Suess books in pairs. With choral speaking you don’t stutter, although some of the Dr. Suess rhymes and made-up-words can trip you.
- Reading a Winnie-the-Pooh story with each character doing

a type of speech therapy. Winnie-the-Pooh hums a lot, so he used continuous phonation. Owl used the Hot Airflow Method. Eeyore used Dreary Auditory Feedback, which is tediously slow and depressing, but makes you fluent. T-T-T-Tigger b-b-b-bounced his words. Rabbit talked fast, which makes you stutter. In contrast, the narrator read slowly.

- The funnest meeting was the Speech Disorders Game. I passed out cards, each with a speech disorder: stuttering, lisping, aphasia (forgetting words), spastic dysphonia, speaking in a high voice, speaking in a low voice, speaking fast, speaking slow, unusual accents, spoonerisms (switching the first sounds of words, e.g., the academic toast “Let us glaze our asses to the queer old Dean”), etc. Each person introduced himself using his speech disorder. Then the speech disorders became hearing disorders. In other words, the “lisp” person could only hear people who lisped, the “accent” person could only hear people who spoke in a funny accent. To carry on a conversation with several people, you had to constantly change your speech! People talked and talked and talked, for an hour, saying inane things to each other in funny voices. Or else they were laughing at other people. No one stuttered! Several people were astoundingly good at spoonerisms and hilarious accents. We also learned that there are worse speech disorders than stuttering.

Talking About Your Stuttering

One of my customers sent me this e-mail:

I am a severe stutterer. At the time I ordered the Pocket DAF, I was blocking on every single word I spoke. I decided to try the DAF with the encouragement of my speech therapist.

The first day I brought it to work, everyone in my office tried it. Before long, everyone in the entire office

area was in my office wanting to hear me talk and try it out themselves.

I found the experience both wonderful and frightening. It was wonderful to know that so many of my co-workers wanted something good for me and were so excited about seeing it happening. It was frightening because I didn't know if the effects of the DAF would last. I've found that having the DAF allows (forces) me to be more open about my stuttering because everyone can see that I'm using some sort of device. I also think that it helps people understand my stuttering. If something analogous to a hearing aid can help, maybe my stuttering doesn't seem so mysterious to them after all!

After using the device over a year now, I'm very pleased to report that many people at the National Stuttering Project convention remarked on how much my fluency had improved since they last talked to me.

I use the DAF only sometimes at work and most of the time on the telephone. I'm very glad that I bought it.

In ten years working with the same people, she'd never discussed her speech. When she brought up the subject, she found that her co-workers wanted to support her.

Watch the video I made interviewing people about my speech. You'll see that everyone was supportive. (The video is on the DVD that comes with this book, or on my website.)

Listeners have different messages for mild and severe stutterers. Mild stuttering is "no big deal" or even appealing to listeners. A movie producer told me that my stuttering was appealing because it showed that I wasn't a "phony" person. Apparently she'd met plenty of "phony" people in Los Angeles (i.e., people who pretended to be someone they weren't).

In contrast, a mild stutterer may be able to successfully hide stuttering, but listeners figure out that he's hiding something. Listeners may not know what he is hiding, but he'll come across as "phony" or dishonest.

Listeners have a different message for severe stutterers. Severe stuttering disturbs listeners. They don't understand stuttering.

They want to know if there's anything they can do to help you. But they're too polite to ask you about your disability. They want you to educate them. They don't want the proverbial "elephant in the living room" that no one will talk about.

The Disability Hierarchy

Some disabilities get more respect than others. Most people respect individuals with visible physical disabilities. For example, you'd make room on a crowded bus for a paraplegic using a wheelchair.

Individuals with non-visible physical disabilities, such as heart disease, get less respect. Would you give up your seat on a bus for a man who said that he had a heart condition and couldn't stand for long periods? What if he were your age and looked healthy?

Non-physical, visible disabilities get even less respect. For example, a man gets onto a bus, talking excitedly to no one. You don't see a cellphone earset in his ear. Plus he's repeating the same paranoid sentence over and over. You suspect he has schizophrenia. You see people on the bus getting up from their seats as he approaches—and getting off at the next stop.

The least respected disabilities are non-physical and non-visible. Stutterers look normal, until we talk. Listeners feel shock seeing you go from normal behavior one moment to head jerks, facial spasms, and being stuck in disfluencies the next moment.

But you can move up the disability hierarchy. You can change your stuttering into a visible, physical disability:

- Wear a National Stuttering Association button.
- Tell people that you stutter.
- Tell a stuttering joke (page 163).
- Show people your anti-stuttering device.

In contrast, hiding your stuttering throws away the respect and support that people would otherwise give you.

I used to get calls asking for an anti-stuttering device that was completely invisible, 100% effective, and required no speech therapy. I'd explain that no stuttering treatment could do that.

Then I'd suggest that perhaps their real problem wasn't stuttering, but rather was fear of listeners discovering that they stuttered. If you fear listeners discovering that you stutter, then your stress increases and you're more likely to stutter.

My company used to have a 10% return rate. Then another company marketed their anti-stuttering device as an invisible "miracle cure." Since then I've gotten no calls from stutterers wanting invisible instant cures. My return rate has dropped to less than 1%. I've heard that the other company has more than a 25% return rate. I'm happy that the "miracle cure" stutterers buy from them, not me.

What to Talk About

Of course, stuttering doesn't often come up as a topic of conversation. You'll have to bring it up.

I used to go up to strangers and say "My speech therapist wants me to introduce myself to more people..." That leads to listeners asking about speech therapy and stuttering.

Now I take my anti-stuttering device out of my pocket, and say that I'm putting on my anti-stuttering device. Almost always the listener asks me about the device.

I then ask the listener if she wants to try the device. I explain that I can adjust the device to make fluent people stutter.

Then all the conversations in the room stop. Everyone turns to watch my victim tripping over her tongue trying to count to ten with DAF adjusted to 200 milliseconds. Then they line up to try the device. And sometimes, after I've been the life of the party for a while, an attractive person wants to talk to me at length about stuttering, usually because she has a friend or relation who stutters.



Stuttering at Work

I am 21 years old. Recently, I graduated from my third college course and still no job. Interviews come by the dozens but job offers are none! I am a Pharmacy Assistant Health Care Aide plus a medical transcriptionist, but after all the years in school and all the money spent on education, I am still unable to find work! Am I to live in poverty because people only see me at my worst?

Interviews for me are a horrid experience. I've had people pick up a newspaper and start reading it, waiting for me to get out of a block. All the interviewers act as if I'm wasting their time. It's more like they're wasting mine.

If people could only see me when I am fluent I'm sure I would have a job. On interviews I find myself apologizing for my speech...but why do I?

Is there anyone out there who is experiencing the same problems? I need help to cope.²⁷⁶

I am an embedded software engineer, and today I was faced with a situation that I have not run into yet in my pursuit of employment. Like many of you I have had the phone hung up on me by recruiters, or they rudely and quickly end the phone conversation. I had a personal phone interview with Motorola. First, the interview was designed to be very high stress. Second, the questions were given to me in advance which only made the situation worse. Of course it being a phone interview made it worst. I was unable to form sentences and completely locked up on the interview and was eliminated from the running for this software engineering position. Can I do anything? According to the recruiter I'm a great fit for the position, god this is frustrating.²⁷⁷

Graduate students in my stuttering class [surveyed employers, who] indicated that they would prefer to hire someone who was deaf or someone with moderate cerebral palsy rather than someone who stuttered. Interestingly, several of the employers who said they would not hire a stutterer had one or more stutterers already working for them.

When we probed to understand the WHY behind the employers' responses, we learned that essentially they thought they "understood" deafness and cerebral palsy, but stuttering was strange—and they assumed that persons who stutter were strange.²⁷⁸

Ten months after completing a stuttering therapy program, 44% of stutterers had received a promotion. 40% had changed jobs, 36% reporting that the change was for the better. Combining these, about 60% had improved employment after stuttering therapy. The study also found that 88% of the stutterers had maintained their fluency.

Their employers reported a 20% improvement in "communication effectiveness" for the stutterers completing therapy.²⁷⁹

Stutterers earn approximately \$7200 less per year than non-stutterers.²⁸⁰ Two groups of 25 persons were examined. The groups were matched for age, sex, IQ, race, education, and socioeconomic background. The subjects were contacted ten years after graduating from college. They were asked a number of questions relating to levels of achievement. The difference did not appear to be the result of employer discrimination. Rather, the stutterers were reluctant to accept promotions that involved making presentations to groups of people:

I have refused (or went "kicking") different projects at my job, which may/may not lead to promotions. Most recently, I went kicking on co-facilitating a corporate-wide quality workshop initiative. My partner in facilitation, after much coaxing by me, took the majority of the speaking sections, while I became her assistant. (Please be aware that I have not discussed my disorder with my

co-workers, I am a mild stutterer that can usually “pass” for a fluent speaker.) I am now interested in changing careers and am looking for careers that focus on “behind the scenes” work...in other words, technical writing. I have considered such careers as Law, but have veered away from them.²⁸¹

Talk About Your Stuttering

Another interview lasted about two minutes. The interviewer (another personnel director—they seem to be the worst problem) found an excuse to say I was not qualified for the job—so good-bye. I protested, asked for the technical interview and was asked to leave. As his excuse was plainly made up—this was also probably a case of discrimination.²⁸²

Begin the interview by talking about your stuttering. You may only get two minutes if you don’t!

Whether you’re looking for a job or already have a job, talk about your stuttering. Many people feel uncomfortable talking to a person who stutters. Educate them about stuttering to make them feel comfortable.

Some people make incorrect assumptions about individuals who stutter. For example, some people think that individuals who stutter are mentally retarded—even if you have a Ph.D.!

“Excellent communication skills” is the #1 qualification employers look for. Regardless of whether the help-wanted ad included this, say that you have excellent communication skills. Give concrete examples:

- If you’re in a speech therapy program, discuss your progress and the techniques or strategies you use.
- If you learned nonavoidance skills in speech therapy, explain that although you stutter, you’ve overcome your fears of talking to strangers, etc.
- “I can say a phrase fluently if I say it a lot. In my last job, I

pretty much said the same things to customers all day, and my speech was fine.” This should be acceptable for retail jobs, etc.

- If you use an electronic anti-stuttering device, show it to the interviewer and explain how it works.
- If the job requires making presentations, say that you can’t say as much as non-stutterers so you prepare your remarks in advance and get right to the main points, unlike people who ramble on for half an hour.

Membership in Toastmasters proves that you have excellent communication skills. Toastmasters gives out lots of prizes, so mention if you won a blue ribbon for one of your speeches.

Communication is a two-way street. Say that you may not speak as well as other people, but you listen more carefully. Demonstrate that by not interrupting the interviewer, and by rephrasing and repeating back his questions. Ask the interviewer whether listening or speaking is more important in the job—they’ll always say that listening is more important.

The interview for the job that I currently have was one of the few interviews in which I discussed in depth the nature of my stuttering problem. I spent about a half-hour discussing my speech, and I think that it was very helpful for the interviewer in understanding how well I could work around my handicap.²⁸³

The Americans With Disabilities Act

In 1992, the Americans with Disabilities Act (ADA) outlawed employment discrimination against individuals with disabilities. Speaking was defined as a “major life activity” that the inability to do is disabling.

The central point of the ADA is that individuals with a disability can ask their employer (or potential employer) for a *reasonable accommodation*. A reasonable accommodation is a change to the job that will enable the individual to do the job. For example, a stutterer might ask that someone else answer the telephone. Or he

might ask that the employer buy an anti-stuttering telephone.

When an individual with a disability requests a reasonable accommodation, the employer must make the accommodation. The individual must make the request. If the individual doesn't make such a request, the employer is not obligated to suggest an accommodation, or to hire the individual.

Employers aren't allowed to ask employees (or potential employees) about disabilities. You have to bring up the subject.

For more information about the ADA, visit the Equal Employment Opportunity Commission website at <http://www.eeoc.gov> or <http://www.justice.gov/disabilities.htm>.

The ADA does not apply to the federal government, including the military services. The ADA covers only employment discrimination. Other laws may cover discrimination or harassment outside of work (e.g., bad service in a restaurant).

Vocational Rehabilitation

If you're looking for a job, make an appointment with a vocational rehabilitation counselor. Look in your telephone directory's blue (government) pages under your state's department of labor.

Voc rehab counselors want you to succeed. They'll get you whatever therapy, anti-stuttering devices, or job training you need. The only complaint I've heard about voc rehab is the waiting lists. You may have to wait months to get help.



Listener Reactions

In 2003 I was in an acting class. We wrote, directed, and performed an original play. After the final performance a friend videotaped me asking audience members what they thought of me stuttering in the play. You can read the transcript below or watch the video on the DVD that comes with this book (the video is also on my website).

First Interview

WOMAN: I thought you did a great job. And at first I didn't know if it was part of the acting or not. I even asked Richard if it was part of it or not. I couldn't even tell if you were acting or if it was real. But I thought you did a great job and I didn't think it made it any worse than it would have been if you didn't stutter. I thought it was great.

Second Interview

WOMAN: I thought you were excellent. I met you before the show so I already knew. But it was like part of the act. I didn't know that was an anti-stutter device. I just thought that was part of your costume. I thought you were great.

Third Interview

TDK: What did you think of my stuttering?

MAN: It just seemed natural, like a part of who you were. And also there were times when you used it well.

TDK: If you heard that another play had an actor who stuttered in it, would that make you less likely to go see the play, or would you

not care?

FAST-TALKING WOMAN: It gives the opportunity to slow down and actually the words that are being said. Otherwise if they're flying by too fast then it just kinda does just that, you're not even able to catch it as it rides by. But if you slow down and catch, you syllabalize it goes then that would seem to me to be a good thing. Just kinda slowing down the gears a little bit, snapping them back.

Fourth Interview

TDK: What did you think about me stuttering?

SETH'S MOM: Well, what I first thought that it was part of your act. Then eventually I caught on and I just thought it was great that you were performing and just being who you were and being an actor and making us all comfortable with that. It's not an experience I have every day, communicating with someone that has any kind of speech difficulties. And then the part where you said, "No, I just stutter," after the crushed nut episode, that was just a real, it just helped us all, kind of, yeah, it was a joke, and broke the ice, along with everything else being, talk about rawness of human emotions and kind of everything laid open, it was very helpful, and once again remembering that we're all human and we all have things to contribute and we all have things we don't like about us.

SETH: I felt like it's engaging to watch you perform because what's engaging about a performer is presence, and you're ability to stay present with the dynamic of your character, even though you're stuttering. It's very interesting, it's like, if you're that committed as a performer, to move through what might be difficult, it engages me.

TDK: What did you think of my electronic anti-stuttering device? Was it weird or distracting that I was using this?

SETH: Well, since I know you, David, I thought, OK, I wonder if that's an anti-stuttering device? But I didn't even think about that until I'd seen it like ten minutes into the show. It was just like, maybe this is character. I really that it was part of a shift of character because you used it really well.

TDK: There's a group of teenagers who stutter in New York City who've formed an acting company. Is there anything you'd like to tell them?

SETH: Hell yeah! I support you in training as young warrior artists.

Fifth Interview

TDK: What did you think about me stuttering?

DUNE: I just saw these different characters on stage, and it was just a quality of that character. Every different, completely different character. It took on a different quality, just like any other attribute that a person would have.

TDK: A group of teenagers who stutter in New York City have formed an acting company. Is there anything you'd like to say to them?

DUNE: Right on! Just keep doing what you're doing. I mean, I think that watching the performance, people that are trying out these different aspects of themselves, I want to do it. So I think that anyone that's doing it, go for it. It must be really a freeing thing, and takes a lot of courage.

Sixth Interview

TDK: Nir Banai was also in this play. What was it like working with a person who stuttered?

NIR BANAI: It was great. It was very inspiring to see you do such a

performance with stuttering and having so much confidence to do it. It was really impressive. It was so impressive that you even used it as a joke in one of the skits. I was really impressed that you feel so comfortable with it.

Seventh Interview

TDK: If you heard that another actor in another play stuttered, would that make you less likely to go to the play?

MAN: Well, no, I don't think so. I mean, no. Definitely not.

TDK: There's a group of teenagers who stutter in New York who have formed an acting company. Is there anything you'd like to say to them?

MAN: Well, um, so, I think if they are looking for some inspiration then, um, well, if I was them I would have found that tonight.

Eighth Interview

TDK: What did you think about me stuttering?

GIGGLING WOMAN: I thought it was beautiful. You did a great job, I thought it was very real. Yeah, I was convinced—

TDK: Well, it was real, I do stutter!

GIGGLING WOMAN: You do stutter? No, you don't really stutter, do you?

TDK: Amazingly real, isn't it?

GIGGLING WOMAN: It was. It was very very real.

TDK: Wow. Great. I achieved that.

GIGGLING WOMAN: Yeah.

TDK: What did you think of the electronic anti-stuttering device I was wearing?

GIGGLING WOMAN: Oh this thing? I thought that was super cool. I did, I thought it was great.

Ninth Interview

TDK: What did you think of me stuttering?

WOMAN: It was beautiful. For real. I thought, I was much more, like, into the creativity of the play and thought that you guys pulled off a really beautiful creation, that you guys made.

TDK: You weren't wishing they had someone who wasn't stuttering?

WOMAN: No way, man. No way. I thought it was beautiful. It was great. You were great. I was very impressed.



Other Fluency Disorders

Cluttering

Cluttering (also called *tachyphemia*) is a communication disorder characterized by speech that is difficult for listeners to understand due to rapid speaking rate, erratic rhythm, poor syntax or grammar, and words or groups of words unrelated to the sentence. One description is speech with “sudden impulsive bursts that are filled with misarticulations and disfluencies.”²⁸⁴ The person with cluttering may experience a short attention span, poor concentration, poorly organized thinking, inability to listen, and a lack of awareness that his or her speech is unintelligible.

Cluttering is sometimes confused with the stuttering. Both communication disorders break the normal flow of speech. However, stuttering is a speech disorder, whereas cluttering is language disorder. In other words, a stutterer knows what he or she wants to say, but can't say it; in contrast, a clutterer can say what he or she is thinking, but his or her thinking becomes disorganized during speaking.

Stutterers are usually disfluent on initial sounds, when beginning to speak, and become more fluent towards the ends of utterances. In contrast, clutterers are most clear at the start of utterances, but their speaking rate increases and intelligibility decreases towards the end of utterances.

Stuttering is characterized by struggle behavior, such as over-tense speech production muscles. Cluttering, in contrast, is effortless.

To compare, a stutterer trying to say “I want to go to the store,” might sound like “I wa-wa-want to g-g-go to the sssssssstore.” In contrast, a clutterer might say, “I want to go to the st...uh...place where you buy...market st-st-store.”

Cluttering is also characterized by slurred speech, especially dropped or distorted /r/ and /l/ sounds; and monotone speech that starts loud and trails off into a murmur.

Clutterers often also have reading and writing disorders, especially sprawling, disorderly handwriting, which poorly integrate ideas and space.

A clutterer described the feeling associated with a clutter as:

It feels like 1) about twenty thoughts explode on my mind all at once, and I need to express them all, 2) that when I'm trying to make a point, that I just remembered something that I was supposed to say, so the person can understand, and I need to interrupt myself to say something that I should have said before, and 3) that I need to constantly revise the sentences that I'm working on, to get it out right.²⁸⁵

Another clutterer wrote on an Internet support group:

I just seem to rush through the words, and often slur words together and/or mumble—and as a result I often have to slow down, concentrate, and repeat myself.

Because clutterers have poor awareness of their disorder, they may be indifferent or even hostile to speech-language pathologists. Treatment for cluttering usually takes longer than stuttering treatment. Delayed auditory feedback (page 57) is usually used to produce a more deliberate, exaggerated oral-motor response pattern. Other treatment components include improving narrative structure with story-telling picture books, turn-taking practice, pausing practice, and language therapy.

Neurogenic Stuttering

Strokes, head injuries, brain tumors, neurological diseases, or medications or drugs can stuttering. Neurogenic stuttering can result from lack of muscle control, such as Parkinson's disease; or

lack of motor planning (apraxia); or disfluencies as an aphasic individual searches for words.²⁸⁶

Neurogenic stuttering can have a wide array of symptoms, wider than developmental stuttering, for example, whole word and phrase repetitions. Neurogenic stuttering typically sounds different from developmental stuttering and an experienced speech-language pathologist can immediately recognize the differences. Also, compared to developmental stutterers, *neurogenic* stutterers usually lack the struggle behavior and speech-related fears and anxieties. Developmental stutterers can speak certain words or phrases fluently or speak fluently in certain situation, but neurogenic stutterers generally are disfluent on everything.

Psychogenic Stuttering

Rarely, a period of stress or a traumatic experience causes a teenager or adult to start stuttering. Some cases include struggle behavior, including struggle behaviors even when the person isn't stuttering.²⁸⁷ However, the only case of psychogenic stuttering I've seen had no struggle behavior, but instead was characterized by rapid-fire, effortless repetitions of initial sounds, for example, "b-b-b-b-b-b-b-b-baseball." This person had the worst self-esteem I've ever seen, referring to herself in vulgar racial stereotypes. She was intelligent, attractive, and had a degree from a good university; yet had a low-level job and complained about the men she dated. She'd started stuttering her last semester before graduating from college. She seemed to have been given everything she needed to succeed yet was grasping for some way to fail.

Spasmodic Dysphonia

This speech disorder is characterized by sudden involuntary movements of the vocal folds during speech. Some individuals have involuntary tightening of their vocal folds; others have involuntary relaxation; and still others have both. The resulting

speech sounds either strained and strangled, or weak and breathy. The disorder typically affects middle-aged persons, and affects more women than men.

Social Anxiety Disorder

Individuals with this disorder, also called *social phobia*, experience fear and apprehension in social situations, especially of being embarrassed or humiliated by their own actions. For some individuals the disorder is general, i.e., they experience distress in all social situations. In other individuals the disorder is specific, such as the common fear of public speaking, or the rarer fears of writing in public or using public restrooms.



Practice Word Lists

These 357 words include every combination of consonant and vowel in the English language. The first column spells the sounds in the International Phonetic Alphabet.

Word List 1

e	able		
be	baby		
tʃe	chainsaw		
de	dateline		
fe	famous		
ge	gatepost		
he	halo		
dʒe	jaywalk		
ke	cable		
le	label		
me	mailbag		
ne	nadir	nay-deer	The lowest point
pe	pacer		
re	rabies		
se	saber	Cavalry sword	
ʃe	shapeless		
te	table		
ðe	they		
ve	vacant		
we	weightless		
ˌwe	whale		
ze	zany		

Word List 2

æ	abbey	A monastery
bæ	baboon	
tʃæ	chalice	
dæ	dancer	
fæ	famine	
gæ	gadget	
hæ	hacksaw	
dʒæ	jasmine	A climbing shrub with white flowers
kæ	cabin	
læ	ladder	
mæ	macro	
næ	knapsack	
pæ	package	
ræ	rabbit	
sæ	saddle	
ʃæ	shadow	
tæ	tactile	
ðæ	than	
θæ	thankful	
væ	vanish	
wæ	wacky	
ˈwæ	whacker	
jæ	yammer	
zæ	zander	European perch fish

Word List 3

å	achoo	
bå	baa	
tßå	cha-cha	
då	dachshund	
få	father	
gå	gaga	
hå	hah	
dΩå	jaunt	
kå	calf	
lå	launch	
må	macho	
nå	nachos	
på	pasta	
rå	rajah	Indian prince
så	psalm	
ßå	shah	Sovereign of Iran
tå	tabla	Indian hand drums
wå	waft	
jå	yahoo	Boorish or stupid person
Ωå	genre	

Word List 4

eager
beachfront
cheap
dealer
feature
geese
healer
genius
kiwi
legion
meager
kneecap
peaceful
react
cease-fire
sheepdog
teak
thee
theme
V-eight
weasel
wheel
yeast
zeal

Word List 5

any
bedtime
checkbook
dentist
felon
guest
health
gentle
kettle
leather
meadow
nephew
peck
redwood
self-talk
shepherd
ten-speed
them
theft
vent
wealthy
whether
yell
zest

Word List 6

aisle
byte
child
diamond
fiber
guide
height
jive
cayenne
lion
micro
knife
pie
rhino
cyclist
shiner
thyme
thy
thigh
vibrant
wildcat
whitefish
yipe
xylan (plant substance)

Word List 7

image
bemoan
chipmunk
divide
fishbowl
gift-wrap
hitchhike
ginger
kibbutz
lily
midcourse
nimble
picture
rebel
system
shiftless
ticket
this
thicket
vicar
wizard
whimsy
yip
zigzag

Word List 8

oaken
boastful
choke
domain
focus
ghost
hoagie (sandwich)
joke
coleslaw
locust
motion
noble
pollster
romance
soapstone
chauffer
toaster
those
thole (endure)
vogue
woven
yolk
zonal

Word List 9

otter
bobcat
chocolate
docile
foggy
goblin
hobby
jogger
cobbler
lobster
model
knockout
pocket
robin
soccer
shocker
toddler
volley
waffle
whopper
yacht

Word List 10

alder
bald
chalk
daughter
fallen
gauntlet
hallmark
jaunt
caller
laundry
mossy
gnaw
pause
raucous
salted
shawl
talking
thoughtful
vault
walker
yawn

Word List 11

onion
bubble
chubby
doesn't
fungus
govern
hovel
judge
color
love
money
knuckle
pump
rough
someday
shutter
touchdown
thus
thumbnail
vulgar
once
what
youngster

Word List 12

oil
boil
choice
doily (small napkin)
foible
goiter
hoist
join
coin
loin
moist
noise
poignant
royal
soil
toil
voice
yoicks (cry to encourage foxhounds)

Word List 13

alarm
balloon
debris
facade
galore
hallo greeting
kazoo
lacrosse
macaw
patrol
ramose ray-mose composed of branches

Word List 13, continued

salon

chagrin

taboo

valise

suitcase

yapok

South American water opossum

jeté

zhah-tay

ballet jump from one foot to the other

Word List 14

ouster

bough

chow

downbeat (conductor's downstroke on first beat of a measure)

foul

gauss (measure of magnetism)

hound

jounce (bounce, jolt)

couch

loud

mountain

noun

pouch

round

sow

shout

tout (extravagant praise)

thou

thousand

vouch

wound (as in string, not as in injury)

yowl (cry of distress)

zounds (a mild oath)

Word List 15

butte
deuce
feudal
gewgaw (showy trifle, bauble)
hewn
coupon
mule
neutral
pewter
tuba
view
whew

Word List 16

oomph
butcher
football
good
hoof
cookbook
lookout
nook
pudding
roof
soot
shook
took
wolf
whoops

Word List 17

oops
boomer
chew
deuce
food
goober (peanut)
hoop
juice
coolant
lunar
moon
nougat
poodle
rupee
sewage
shoe
tomb
woo
whoosh
U-boat
zoo



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There have been three eras of stuttering therapy. The Iowa era, beginning in 1927, focused on speech-related fears and anxieties, helping stutterers communicate better while accepting stuttering.

The fluency shaping era, beginning in 1965, trained stutterers to talk slowly and fluently, but too often this fluent speech was temporary or limited to low-stress conversations.

The current neurological era, that began in 1992, treats the underlying conditions that contribute to stutter, using brain imaging, motor learning theory, electronic devices, and medications.

Each era of stuttering therapy has strengths and weaknesses, and all three types of therapy are needed to successfully treat stuttering.

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