Research Studies

Interaction of Language and Motor Processing in Stuttering

Anne Smith, Ph.D., Purdue University

Everyone knows that stuttering, like many human behaviors, is complex. However, people who stutter and clinicians who treat them should be very encouraged. Recent theoretical advances and new technologies to “see” the processes underlying complex human behavior have helped us to make considerable progress in understanding stuttering.

Most scientists interested in fluency agree that there is not a single cause of stuttering; rather it is the result of the interaction of several factors. The central issue then is: how and when do these factors interact to produce stuttering? Our model starts with a simple point: to produce speech, the brain must generate sets of neural commands to produce the right amount and timing of muscle activity in a large number of muscles, including those that control breathing, voice, and oral movements. During disfluent speech of children and adults who stutter, it is clear that the brain does not accomplish this task.

Our research, in combination with that from other laboratories, suggests that although stuttering is expressed as a failure of the motor areas of the brain to generate the right muscle commands for speech to proceed, the explanation of why this happens involves the interaction of the brain’s motor areas with other brain systems, including those involved in emotional, cognitive, and linguistic processing. Thus our experiments are designed to test hypotheses such as this: if linguistic processing demands are great (or emotional arousal is high or memory load is great), the motor areas of the brain cannot perform as well in generating muscle command signals. The next phase of our research is an exciting new book for children ages 7 through 12 years old is now available in English thanks to author and speech-language pathologist Eelco de Geus and translator Elisabeth Versteegh-Vermeij, both of the Netherlands and both recognized as specialists in stuttering therapy.

Author Eelco de Geus has specialized in stuttering therapy and works with young children and their parents as well as with teens and adults who stutter. He gives workshops on stuttering therapy both in the Netherlands and other countries. Readers can reach him at elcodegeus@wxs.nl.

Translator Elisabeth Versteegh-Vermeij is a speech therapist who has specialized in family counseling for children who stutter. Having spoken English all her life, she is also an accomplished translator of books and texts on the subject of stuttering.

“Sometimes I Just Stutter” is an age group for which we have long sought good materials,” said Foundation president June Fraser. “A letter from translator Elisabeth Versteegh-Vermeij alerted us to the book’s availability and once we read it, we felt strongly that it would be a welcome addition to our library.”

The book contains letters about stuttering to share with brothers and sisters, aunts and uncles, grandparents, teachers, and parents. It talks about teasing, and about feeling angry and sad inside when you stutter. It also includes lots of stories written by other children who stutter.

This little book has already made an impression on numerous young people who have written SFA with their comments.

Said one sixth grader, “I stopped stuttering around third grade, and it came back in fifth grade...sometimes it interferes with arguments...I’ve started therapy again, and now it isn’t a quarter as bad as it was.”

A seventh grader noted, “the way I think about stuttering is that everyone has his or her own problem. Mine is stuttering...the only time I think about it is when someone asks me questions or starts teasing me.”

One note from a six-year-old sent “love to all the stuttering kids in the world.”

Speech-language pathologists are finding the book helpful in their work in the schools. Wrote one SLP, “I have used this book as a way to facilitate the interaction with my young student who stutters. Reading information in the book helps him discuss his own feelings which had been a bit threatening to him before. Reading about others’ feelings and experiences has allowed him to find a”

Self Therapy for the Stutterer in Slovakian

Malcolm Fraser’s seminal book is now available in Slovakian thanks to the efforts of Branislav Adamik, M.D., a physician from Bratislava, Slovakia.

Dr. Adamik writes, “We are working to place the book in high school libraries across the country so that it will be readily available for those who cannot afford to buy a copy. The Slovakian Psychotherapeutic Association is also recommending the book as is the head of the Slovak Institute for Cognitive and Behavioral Therapy.”

On a more personal level, Dr. Adamik shares with SFA that he too is a stutterer who has been greatly helped by Self Therapy.

“We are now in very bad economic times, so I have suggested to the publisher Renoma that we keep the cost as low as possible so that more people can take advantage of the book,” stresses Dr. Adamik, whose own stuttering problem inspired him to work on the translation.

“We are excited about this translation and the opportunity to reach so many people - young and old alike - throughout the Slovak Republic,” commented SFA president Jane Fraser. Self Therapy for the Stutterer now appears in 11 languages: Japanese, French, Slovakian, Finnish, Czech, Flemish, Danish, Swedish, Russian, Spanish, and Zulu.
Treating Coexisting Stuttering, Language, and Phonology Disorders

Nancy E. Hall, Ph.D., University of Maine

Speech/language clinicians have reported the onset of stuttering during the course of treating a youngster’s language or speech sound impairments. Clinicians who face this dilemma must make decisions about therapy with little information to guide their decision-making.

At the University of Maine, we are examining individual cases of children with communication impairments and stuttering to identify the important factors in treating these children, and to develop innovative ways of therapy. Presented here is one of our case studies identifying three phases of therapy and concluding with our thoughts on what aspects of this youngster’s development were significant to the therapy and recovery processes.

At 3 years, 6 months, Max exhibited moderate expressive/receptive language delays and mild phonological impairment. Stuttering was not a concern. He began therapy working on improving language skills and increasing his use of speech sounds.

Three months into this treatment phase, Max began stuttering, and intervention shifted to working on language while indirectly modeling easy speech, and discontinuing direct work on phonology. After four months, Max demonstrated progress in the language and phonology goals; however, the stuttering continued to increase, with Max showing signs of avoidance.

At this point, we discontinued direct work on speech sounds and language, and began direct fluency therapy, with the following goals: (1) reproduction of slow and easy speech, (2) identification of stuttered speech in conversation, and (3) provision of parental support and resources.

After two months, Max demonstrated no stuttering behavior and his parents reported positive changes in their communicative interactions with Max. The final phase of treatment worked on phonology and language while maintaining fluency. Adequate progress was made in language and phonology, and Max maintained his level of fluency in the classroom, individual sessions, and at home.

Several aspects of this course of intervention are significant. Max demonstrated linguistic impairments in conjunction with what appeared to be significant reluctance to take communicative risks. Possibly, the focus on specific language skills placed an overload on his system, resulting in stuttering. In terms of generalizing the observations of the present study, it is important to note the treatment’s individualized nature. While the initial treatment involved phonology and language, its nature changed markedly following the onset of stuttering, and the second phase of treatment involved facilitating a supportive and fluency-enhancing communicative atmosphere. This required involvement on the part of Max’s parents in the form of participating in the treatment sessions, altering their own patterns of speech, language, and communication, and allowing the therapy to take place in their home. In phase three, we took care to use Max’s foundation of fluency skills, reinforce his success with speech, and ease back into addressing the remaining phonology and language concerns. The main considerations in addressing these concerns included being sensitive to Max’s communicative style, providing ample opportunity for feedback, and using the support of his classroom.

In conclusion, this case study illustrates that individual considerations will determine the ways in which sequential and/or concurrent treatment models are put into effect for any single child. These considerations may include the child’s communicative and language learning styles, the involvement of family members, language acquisition factors, and service delivery methods. A final thought on the case presented here is that treatment of concomitant stuttering and language/articulation disorder can be successful, when careful review and planning occur.

If you are the parent of a child who is receiving speech and language therapy but is having trouble making sounds, words, or sentences accurately and your child begins to stutter, you may want to consider the following:

It is not unusual for a youngster to experience some stuttering while attempting to learn new words, sentences, or speech sounds; your slow and easy modeling of the target sounds, words, or sentences will provide positive opportunities for your child.

Try paying attention to your youngster’s “communicative style,” providing support and encouragement for his or her communication. Let your child know talking can be fun. You should find guidance and support from speech-language pathologists and helpful materials from the Stuttering Foundation of America. Interested in learning more? Please contact Nancy E. Hall, Dept. of Comm. Sci. and Disl., University of Maine, 5724 Dunn Hall, Orono, ME 04469, (207) 581-2404.

SUGGESTED READINGS


Sometimes I Just Stutter
Continued from page 1

way to express his own.

“I believe Sometimes I Just Stutter is one of the best resources available for children aged seven through 12,” said Lisa Scott-Trainum, Ph.D. of Wichita State University. “I give it to children at the end of the evaluation process so that they can take information home. I also use it in therapy in several ways.”

“One child is rewriting his own response to some of the information such as how he deals with teasing. Another is reading and making notes to keep as part of his speech notebook. Yet another is writing her own version of letters to family members so that they reflect more personally what she wants to tell them about her stuttering.”

“The book has been available only a few months and has already reached more than 8,000 people,” added SFA’s Fraser. “That in itself speaks for its intrinsic value to children.”

One of the best comments about the book came from a fourth grader who said, “I can’t believe they wrote a book just for me. I didn’t think anyone else knew about stuttering or how it feels. This is so cool!”

Ann Landers
Again
Features
Stuttering Foundation

In an August 27th column, syndicated columnist Ann Landers gave the Stuttering Foundation’s address for readers looking for help. As Landers’ column reaches an approximate 4,000,000 readers, the response was outstanding.

Replying to a letter from Stacy Smith of Mankato State University, Landers’ column emphasized that readers should “be aware of programs that guarantee fluency.”

SFA heard from a broad array of people looking for help for all ages.

One grandmother wrote, “My granddaughter sometimes can’t say anything and then will say the same word over and over. Please send any suggestions you can.”

Yet another reader from California said, “My nine year old son received therapy for awhile and was dismissed as being fine. Unfortunately this summer the stuttering got much worse. I just feel that the more knowledgeable we all are about the problem, the more we can help him.”

“We have a very dear friend who stutters and would like to pass on any information you have to him,” wrote a concerned couple from Iowa.

A young man from Illinois acknowledged, “To be honest, I feel like a failure, ignorant and stupid when I stutter. I feel like it is holding me back from the person I want to be. Since I read the column and found out about your organization, I feel less alone.”
Research in Early Childhood Stuttering

Ehud Yairi, Ph.D., University of Illinois at Urbana-Champaign

To conduct research and develop effective clinical management strategies for any disorder, it is important to have reliable data regarding its general incidence and prevalence. Fortunately, the incidence of stuttering in different ethnic or racial sub-populations. The natural development and changes in symptomatology during the disorder’s course, and the existence of any subtypes must be documented. This information guides differential diagnoses, prevention programs, selection of treatments for each stage of the disorder, timing of intervention, and the evaluation of treatment efficacy. Such information on early childhood stuttering has been scarce.

For many years, clinicians working with young children who stutter noticed that many preschool children outgrow stuttering with formal clinical intervention while others develop a chronic stutter. As early as 1938, Dr. Bryngelson, a well known pioneer in speech pathology, wrote that a substantial number of children who stutter would not need the help of a speech clinician because the stuttering would disappear of its own accord. Spontaneous (unaided) recovery in stuttering has been the focus of scientific attention and has stirred considerable controversy among scientists during the past several decades, reflecting its critical theoretical and clinical implications. In particular, the questions of how many children recover, how many become chronic, and whether all children who begin stuttering should receive immediate intervention have been hotly debated.

Considering the intense interest, the scarcity of accurate data for the chronic and recovered groups becomes obvious. Past studies attempting to report such data were limited in scope and relied too heavily on second-hand, unreliable data, such as parents’ reports. The Stuttering Research Project at the University of Illinois has sought to answer these questions with reliable data by conducting a longitudinal investigation that includes more than 150 preschool-age children who stutter as well as 60 normally fluent children. The Project, under the direction of Dr. Ehud Yairi with colleagues Drs. Nicole Ambrose, Elaine Paden, and Ruth Watkins (all, University of Illinois), Nancy Cox and Edwin Cook (both, Chicago School of Medicine), Kelly Hall (Northern Illinois University); Rebecca Thorneburg (Eastern Illinois University); and Ofir Amir (Tel Aviv University), and generously supported by the NICHD.

The project is unique for two reasons. First, there has been a sustained effort to identify children close to the onset of stuttering. Second, through periodic follow-up observations, recordings of speech, and multiple assessments of other factors, the course of stuttering has been successfully documented across several years. With first-hand data from a large pool of children, it has been possible to delineate comprehensive information on how stuttering begins and how it progresses. The major findings, as have been reported over the last several years in the Journal of Speech, Language, and Hearing Research (JSLHR), question longstanding concepts about the onset and developmental trends of early childhood stuttering.

For example, it has been believed that stuttering onset was always gradual and occurred under unforeseen circumstances, that early symptoms included only easy repetition of syllables and words, and that parents helped create the problem by reacting negatively to normal disfluencies. The findings of the Illinois project, however, present a very different picture. Stuttering onset was sudden in at least one-third of the children; was severe in nature, including tics, blocks, sound prolongations, and secondary physical characteristics for a good number of children; and, occurred close to a physically or emotionally stressful event for nearly 50% of all cases. The early belief that parents overreact to a child’s normal disfluencies is supported by Illinois Project data as well. Disfluent speech regarded by parents as “stuttering” is actually quantitatively and qualitatively different from normal disfluency, even in the earliest stages of the disorder. It appears that parents’ concern is justified when they suspect that their child has begun stuttering.

In addition to data about onset, the investigators have reported other aspects of early stuttering using longitudinal research methods. Factors of interest included percentages of children who spontaneously recover as opposed to developing chronic stuttering, as well as precipitating factors for either of these two subtypes of the disorder.

With regards to the number of children who spontaneously recover, a recent study tracked children for four years following onset to determine distribution of these children as spontaneously recovered or exhibiting chronic stuttering at the end of the four-year period. The data indicate continuous reductions in frequency and severity of stuttering over time as many children progressed toward recovery. They show that whereas 26% (all of whom received some form of treatment) continued to exhibit chronic stuttering, a large majority (74%) recovered completely without treatment. The tendency to become persistent was greater among boys, and girls tended to recover at earlier ages. This led to the conclusion that for most children seen close to onset, stuttering is often (though not always) a short-lived disorder that disappears apparently on its own, without formal intervention. The investigators maintain that while all children who stutter need to be closely monitored, those likely to persist should be identified early and have priority in receiving available clinical services. Further, the findings make clear that any claim of successful therapy must recognize the strong element of unaided, spontaneous recovery. Future treatment studies should include both adequate control groups and unbiased subject samples.

Isolating factors predictive of risk for chronic stuttering and those of eventual recovery has been another important line of investigation. The scientists associated with the Illinois Project reported several of these factors in the 1999 volume of JSLHR. One study examined consistency of stuttering and phonological abilities. Phonology (speech sound system) was assessed when the children were seen at the first visit, at each follow-up visit and before it was possible to determine who would develop chronic stuttering or recover. Phonology was also assessed during the periodic follow-up visits. Findings indicate that the group of children who persisted in stuttering performed less well on all phonological measures and phonological development progressed more slowly than did the group of children who recovered from stuttering. These findings suggest that presence of phonological difficulties in young children in the very early stages of stuttering may be a sign of chronic stuttering risk, but phonological skills alone may not be a sufficient predictor.

In a similar vein, the children’s expressive language abilities were examined using several language measures. Results show that all children performed at or above developmental expectations for language, regardless of whether they later became chronic or recovered. These findings suggest that precocious language development may be another risk factor for stuttering, but not one that is as yet differentiates persistent from transient stuttering. There seems to be a possibility of varied associations between language proficiency and stuttering development over time. These results yield important implications for future research in the relationship between early language abilities and early stuttering.

In a series of other studies designed to identify factors that may contribute to early identification of chronic and recovered stuttering, the variability patterns of the children have been analyzed over time. Findings in this respect are encouraging. It appears that within a year of stuttering onset, the trend of number of certain disfluency types provides reasonable clues concerning the future course of the child’s stuttering. Of particular interest is the finding that the initial severity of stuttering is not a good predictor of its eventual development. Two additional studies have focused on the speaking rate of the children and on specific acoustic features in their fluent speech. Although some positive findings have emerged, considerably more research is needed.

Finally, one of the most important studies of the project concerns the possible genetic bases of stuttering. Through detailed analyses of the incidence of the disorder within the families of the participating children provided strong evidence not only that stuttering, in general, has strong genetic component, but that the two subtypes of children who stutter, those who persist and those who recover, have different genetic liabilities for stuttering. In other words, the tendency to persist or recover also tends to be heritable. This, as well as the other findings mentioned above, should help us formulate additional research to obtain clinically reliable diagnostic and prognostic procedures for children with high risk for chronic stuttering. Presently, the University of Illinois Stuttering Research Program, with the cooperation of our colleagues from the University of Chicago School of Medicine has placed emphasis on conducting a linkage analysis study designed to identify the gene, or genes, that are responsible for stuttering. For more information, please contact Dr. Ehud Yairi at (217) 244-2547 (e-yairi@uiuc.edu), or Dr. Nicole Ambrose at (217) 244-2559 (nambrose@uiuc.edu).
Stuttering Foundation Reaches Pediatricians at Annual Convention

Because many parents turn first to their pediatrician for help when they hear their child begin to stutter, making sure pediatricians have up-to-date information on stuttering is of utmost importance to SFA.

Speech-language pathologists June Campbell, M.A., Tommie Robinson, Ph.D., Sharon Eichhorn, M.S., Vivian Sisskin, M.A. and SFA Board member Jean Gruss were on hand at the Stuttering Foundation booth in Washington, D.C. in October for this year's convention of the American Academy of Pediatricians.

They fielded questions about stuttering and shared Foundation books, brochures, and videotapes with the 10,494 pediatricians and allied medical professionals in attendance.

"More and more pediatricians are using Foundation videotapes in their offices to educate parents about early childhood stuttering," said speech-language pathologist June Campbell. "This is a positive trend and marvelous way to educate parents."

The Foundation also reached out to those in the nursing profession in 1999 with an informational booth at the convention of the National Association of Pediatric Nurses in San Antonio in April.

Numerous Volunteers Make American Speech-Language Hearing Association Convention a Success

The convention of the American Speech-Language-Hearing Association in San Francisco in November, 1999, gave the Stuttering Foundation an opportunity to reach speech-language pathologists from all over the world. Said Dr. Tatsuo Nagasawa of Japan, "It is always exciting for me to find your many fine books at the ASHA convention each year."


Fielding questions at SFA booth are Susan Cochrane and Lisa Scott Trautman.

Research Studies

Continued from page 1

NIH project on stuttering focuses on the interaction of language and motor factors.

How can we test hypotheses such as these? How can we "see" the brain's motor command signals or get information about the activity of the neural systems involved in linguistic processing? To study the motor commands we place small infrared lights on the lips or jaw, and a digital camera tracks oral movements during speech. This system is completely noninvasive, and we have tested children as young as four years. By analyzing speech movements, we can obtain a good index of how well the brain is doing at generating the muscle command signals. The beauty of this technique is that the person does not have to be fluent. We can see a range of performance even during fluent speech. We know, for example, that as children mature, their brains get better at generating muscle command signals for speech, and they are not like adults until the teen years. Also we have found that people who stutter can perform just like their fluent controls, but that when the speaking task demands are increased (by making the sentences more complex), the muscle command signals of people who stutter (but not the normally fluent adults) start to deteriorate.

As a window on the brain's activity during linguistic processing, we use a system to record the electrical activity of the brain. The subject wears a "bathing cap" with 32 electrodes embedded in it. These electrodes record the brain's activity during linguistic processing tasks. In earlier studies scientists have found very distinctive signatures of brain activity for various types of linguistic processing. For example, decoding the meaning of a sentence is characterized by a different pattern of brain activity in space and time compared to processing the grammar of the sentence. We intend to find out if people who stutter (or a sub-group of them) have different neural processing of language even when they are not speaking, or if they have basically normal linguistic processing abilities. In the same people, we will record oral movements during speech to see if "loading" the linguistic processing system produces negative effects on the brain's ability to send the "right" command signals to the speech muscles. We will then know if people who stutter (or a sub-group of them) have either (a) normal language processes or (b) atypical language processes that interfere with motor commands for speech. We also will be studying children, as we believe that the potential interaction of language and motor factors in fluency could change over the life span.

Our research team (Anne Smith and Christine Weber-Fox from the Department of Audiology and Speech Sciences, Howard Zelaznik from the Department of Health,

Continued on page 7
Videotapes at Record Number of Public Libraries
Web Site Features Libraries with Videos

The Stuttering Foundation reports that its videotapes are now available in over 3,500 libraries nationwide.

The listing of these libraries can now be found by visiting SFA’s Web site at www.stutterSFA.org. Said Foundation Board member Jean Gruss, “Being able to pinpoint on the Web which library has these videotapes on stuttering is going to save people a lot of time and effort.”

Some recent comments from librarians indicate that the need for these materials is great and that there is a demand for them from patrons.

Public Library in Belen, New Mexico, “Your help is most important to us in our effort to improve our services and expand our collection. We appreciate your donation and continued enthusiasm and support.”

“The entire community benefits from gifts such as yours,” adds Pilar Odenheim of the William E. Dermody Free Public Library in Carlstadt, New Jersey.

Elaine Butler, librarian for Support for Families of Children with Disabilities in San Francisco, California states, “Thank you for the video ‘Therapy in Action: The School-Age Child Who Stutters.’ It will be an excellent addition to our library. We appreciate your support of our programs.”

For the past six years, the Stuttering Foundation has sent its videotapes free to thousands of public libraries.

If your local public library has any of these tapes and they are not listed at our Website, please notify the Stuttering Foundation so these libraries can be added.

Once the library has shelved the tapes, SFA sends a press release to all of the local newspapers to apprise readers of their availability.

The SFA will continue to offer free tapes to public libraries, and the newest videotapes for adults, teenagers, and school-age children are no exception. If your library would like copies, have the librarian call the Foundation at 1-800-992-9392, or write to the address on the back of the Newsletter.


- The Web site now lists all public libraries which have shelved SFA videotapes for all ages. Once you reach the home page, hit the “Resources” button and then click on “Library Lists.” After clicking on the state, a listing for the libraries in alphabetical order by city will appear. The material each library has is listed by number after the address. The titles of the materials that correspond to each number are listed at the top of the page above the list of libraries.

- Also under “Resources” is the worldwide referral list to speech language pathologists (SLP’s) who specialize in stuttering. After hitting the “Resources” button, click on “Referral List.” Choose “foreign” or “domestic” and after clicking on your choice, click on your country or state. A list in alphabetical order by last name will appear.

- The complete text of all the SFA brochures is available by scrolling down the home page and clicking on “Brochures.” Look for the three new brochures: If You Think Your Child Is Stuttering which has new tips for parents; The Child Who Stutters at School: Notes to the Teacher which has new tips for teachers, day care personnel and parents; and Stuttering: Answers for Employers which has facts on stuttering and tips for the workplace.

Books Available at www.stutterSFA.org!

- The Web site has the entire text and illustrations of SFA’s newest book for kids ages 7-12, Sometimes I Just Stutter. See page one of this Newsletter for more information about this exciting new resource for young people.

Research Studies

Continued from page 4

Kinesiology, and Leisure Studies at Purdue University, and Janet Nichol, Department of Linguistics, University of Arizona) is extremely excited about the next phase of our research on stuttering. We are grateful to the National Institute on Deafness and Other Communication Disorders of the National Institutes of Health for support of this project (“Physiological Correlates of Stuttering,” R01 00539).
National Stuttering Awareness Week—May 8-15, 2000

Stuttering didn’t stop them...

and it need not stop you.

Stuttering Intervention: A Collaborative Journey to Fluency Freedom by David Allen Shapiro, published by Pro-Ed, Austin, TX.

Paroles de parents by Anne-Marie Simon, L’Oratorio-Édition, 76, rue Jean Jaures, 62230 Isbergues, France.


Nature and Treatment of Stuttering: New Directions by Richard F. Curlee, Ph.D., and Gerald M. Siegel, Ph.D., published by Allyn and Bacon, Needham Heights, MA.

Special Children, Stuttering Parents, by Robert A. Naseef, Ph.D., published by Carol Publishing Group, Secaucus, New Jersey, 1-800-447-2665.


Elements of Stuttering by Courtney Stromsta, Ph.D. Available from Atmore Publishing Company, P.O. Box 533, Oshtemo, MI 49077. Please send $19.50 plus $3.00 handling charge.

Stuttering: A Search for a Cause and a Cure by Oliver Bloodstein, Ph.D. It is published by Allyn & Bacon, Needham, MA.


The Telecommunication Relay Service Handbook by Franklin H. Silverman, Ph.D. Aegis Publishing Group, Ltd., Newport, RI.

Unforgettable Characters I Have Known by Bill Lyne. Published by BookPartners in Wilsonville, OR, 503-682-9821 or 800-895-7323.


Speak Mandarin Not Dialect by SLP Elizabeth Haynes. Available through Thesidledown Press Ltd., Saskatoon, Saskatchewan, Canada, 306-244-1722 or www.thesidledown.sk.ca.

Happy New Year from the staff and consultants Stuttering Foundation of America!