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Neurobiologic Substrates of Stuttering

by Anne Foundas, M.D.

Although stuttering occurs in 1 percent of the population and is a major source of disability and suffering, little is known of its biological basis. Many theories of stuttering have focused on cerebral dominance, and investigators have proposed that atypical cerebral dominance may in part account for the dysfluencies characteristic of stuttering.

Orton (1927) and Travis (1931) were the first to espouse a cerebral dominance theory of stuttering. They suggested that stuttering was the result of incomplete cerebral dominance. Although the muscles that mediate speech function are paired structures, those on the right side receive input from the left cerebral cortex and those on the left side receive input from the right cerebral cortex. The impulse from the left and right cerebral hemispheres must be synchronized to assure fluent speech production. It was, therefore, hypothesized that this synchronization could only occur if there was a "leading" hemisphere. The leading or dominant hemisphere would then impose its timing patterns over the other hemisphere and thus achieve fluent speech output. However, if the margin of dominance was reduced, then stuttering would result. Although recent studies have suggested that anomalous dominance may play a role in the manifestation of stuttering, the precise neural substrates, behavioral and cerebral asymmetries that may reflect anomalous cerebral dominance have not been worked out.

The major objective of this project is to study neuroanatomical models of stuttering. We hope to learn more about the neural substrates of stuttering and to identify subtypes of people who stutter. To achieve these goals we will

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Gregory Presented with First Malcolm Fraser Award 50th Anniversary Dinner Site of Award

MEMPHIS—Hugo H. Gregory, Ph.D., of Northwestern University is the recipient of the first Malcolm Fraser Award in recognition of his lifetime achievements in helping those affected by stuttering.

Professor Emeritus of speech-language pathology, Gregory is the first member of his profession to be honored with this award. The Memphis-based Stuttering Foundation of America presented Gregory with the Award at the American Speech-Language-Hearing Association's 1997 Special Interest Division on Fluency conference in Tucson, Arizona, on May 1, 1997.

"Dr. Gregory is himself a pioneering figure in his profession," noted SFA President Jane Fraser. "He is a master clinician, teacher, innovator, and role model for those who stutter. For decades, he has devoted his



SFA Board member Jean Gruss, Jane Fraser, Hugo H. Gregory, Ph.D., SFA Board member James Spurlock.

energies to scientific research, teaching, and first-hand clinical therapy in order to advance our knowledge of stuttering."

Gregory is also author of over 40 journal articles and book contributions as well as five textbooks. The chair of numerous committees on fluency

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Physician Translates *Self-Therapy for the Stutterer* into Slovakian

Adamik Branislav, M.D., a physician from Humenne, Slovak Republic, is currently working on a translation of *Self-Therapy for the Stutterer* by Malcolm Fraser into Slovakian.

Said Dr. Branislav in a letter to the Stuttering Foundation, "I was so interested in this way of therapy that I have decided to translate and publish this interesting book. I can state that it will be the first *good* book devoted to self-therapy in the Slovak Republic.

Self-Therapy for the Stutterer has been translated recently into Russian and Danish. It is also available in French, German, Flemish, Persian, Arabic, Finnish, Spanish, and Lithuanian. The book has been distributed to readers in 63 countries around the world. □



Specialists Workshop Celebrates 12th Year

The Memphis-based Stuttering Foundation of America and Northwestern University hosted their annual instructional workshop for speech-language pathologists specializing in stuttering from July 14 through July 25, 1997.

Each year, 20 speech pathologists from around the world with a special interest in stuttering are accepted to participate in the workshop. Under the leadership of Dr. Hugo Gregory, the workshop is organized to focus on therapeutic skills and techniques for intervention with children and adults.

"The amount of information I've learned is tremendous," said Katerina Kalajidou of Greece. She remarks that in Greece, with far fewer speech pathologists, getting new ideas on the treatment of stuttering is difficult.

This year's workshop participants come from the United States, Canada, Argentina, Norway, Brazil, Italy, and Greece.

"We're gaining new perspectives and are excited to return home with them," added Andre Courcy of Montreal, Quebec, and Dr. Claudia Andrade of Sao Paulo, Brazil.



Marilyn Langevin, Mirella Michielin, Jennifer Hicks, Merethe Moerk.



Standing left to right: Sharyn Mann, Dianne Mohebbi, Christine Livingston. Seated: Louisa Hopkins.



Workshop Director Hugo Gregory with Diane Hill, Carolyn Gregory and June Campbell

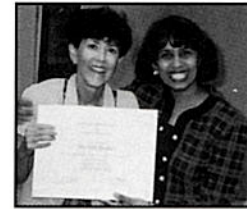
"The Workshop was inspirational as well as being the most thorough and well organized I have ever attended," remarked Susan Hamilton of Seattle, Washington. "It was a wonderful opportunity to connect with other speech-language pathologists who specialize in the treatment of stuttering so that we can continue to support and learn from one another," she added.

This unique workshop has gained international recognition for its excellence in the post-graduate study of stuttering.

This year's class of 1997 made a generous donation to the Stuttering Foundation. "This gift is particularly meaningful to us this year, our 50th anniversary," said Jane Fraser, president of SFA, "as it acknowledges the confidence the workshop participants place in the work we are doing on behalf of those who stutter."

For more information about this intensive workshop which will

take place in July, 1998, write: Dr. Hugo H. Gregory, Speech and Language Pathology Department, Northwestern University, 2299 Campus Drive North, Evanston, IL 60208-3570, or call the Stuttering Foundation at 1-800-992-9392. Fellowships for the workshop are provided by the Stuttering Foundation. □



Jane Fraser of SFA and Sucheta Kamath from Massachusetts General Hospital in Boston.



Andre Courcy leads group in a lively song of thanks.



Katerina Kalajidou of Greece thanking the staff for their dedication



Jennifer Hicks from Nashville and SFA's Jane Fraser



Workshop Participants. Back row: Jane Ramig, Marilyn Langevin, Jennifer Hicks, Mary Ornstein, Phyllis Stevens, Sharyn Mann, Sucheta Kamath. Middle row: Jennifer Avellino, Susan Hamilton, Katerina Kalajidou, Andre Courcy, Claudia Andrade, Shailla Lucas, Louisa Hopkins, Sue Shirley, Merethe Moerk, Becky Peters, Mirella Michielin, Christine Livingston, Mariela Ginhson, Dianne Mohebbi. Front row: June Campbell, Diane Hill, Hugo Gregory, Jane Fraser, Joe Fulcher, Carolyn Gregory.

Stuttering Foundation Announces 1997 Award Winners in Journalism

The Stuttering Foundation of America announced its 1996-1997 Awards for excellence in reporting that furthers the public's understanding of this complex disorder during National Stuttering Awareness Week.

"We are very pleased by the increased attention that print and electronic journalists are giving to the causes and treatment of stuttering," said Jane Fraser, president of the non-profit foundation. "The numerous entries again this year clearly reflect that stuttering is receiving much more professional attention from the news media."

Seven journalists in distinct categories are equally honored this year for their outstanding contributions. They are:

Cecelia Goodnow of *The Seattle Post-Intelligencer* in Seattle, Washington. Her article, "A Manner of Speaking," thoughtfully examines the success that speech clinicians are encountering when parents of children who stutter seek early treatment.



Cecelia Goodnow

Excellent tips for parents are also included in this piece which is co-winner in the large print publication category.

Marsha Harlow of *The San Antonio Express-News* in Texas for her first-person account of how one copes and overcomes challenges in the workplace as a person who stutters. The co-winner in the large print category provides a candid and inspiring account of how she overcame the fear of stuttering to become features editor and a team leader at her newspaper.



Marsha Harlow

David Uhler, also of the *San Antonio Express-News*, who took second place in the large print category

for his news article, "Freedom of Speech." A well-informed and insightful reporter, Uhler examines alternative theories concerning the potential neurological causes of stuttering and the reasons for different therapy approaches.

Judy Kay of *The Niagara Gazette* in New York, honoree in the smaller print category for "Speaking About Stuttering" and "Help Is Available for Millions Who Stutter." In articles that were read nationally when subsequently distributed by the Gannett news wires, she cogently outlines what one should weigh in deciding whether to seek professional help for this speech disorder. She also points to famous role models who stutter.



Judy Kay

Linda Lewis Griffith, winner for her widely-read "Parenting" in the syndicated columnist category, for her excellent piece on why some children stutter. She includes specific suggestions on how parents can help their children if they stutter and where to go for help.



Linda Lewis Griffith

Producer Mike Getter and Dr. Alix Casler of *Americas Health Network* for an informative television segment with speech-language pathologist June Campbell. Winner in the electronic media category, this program demonstrated the unique ability of specialized cable networks to examine in depth a speech difficulty such as stuttering and to provide give-and-take questioning.

Each of the Stuttering Foundation of America 1996-1997 first place winners received a cash award of \$250.

FREEDOM of SPEECH
Groundbreaking research... light on origins of stuttering

A manner of speaking
New approach to stuttering focuses on childhood therapy
By Cecelia Goodnow

Speech strategies give editor more confidence to live with stuttering
By Marsha Harlow
FEATURES EDITOR

Editor meets stuttering head on
By Marsha Harlow

How parents can help

Speech strategies give editor more confidence to live with stuttering
we were. Mallard, with whom I had...
...decades to get to this point...
...the day my second grade

Memphis Conference Draws Record Crowd

The program, the participants, and the weather were all a big success on June 20 and 21, 1997, in Memphis, Tennessee, for the *Stuttering Therapy: Practical Ideas for the School Clinician* SFA seminar!

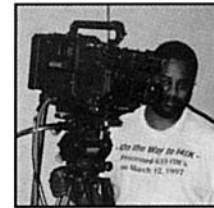
Co-sponsored by the Stuttering Foundation of America and the University of Memphis this year, the annual seminar, designed expressly for speech language pathologists in the schools, was held at the Crowne Plaza Hotel overlooking the Mississippi River in downtown Memphis, Tennessee.

One hundred and twenty school based professionals heard and interacted with fluency experts and clinicians—Peter Ramig, Barry Guitar, Ed Conture, Pearl Gordon, Ellen Bennett, Bill Murphy, Kristin Chmela, June Campbell, Patricia Zebrowski, Nina Reardon, Rich Forcucci, Charles Healey, Ann McKeehan, and Barbara Moore-Brown. Dr. Walter Manning was conference coordinator, ably assisted by Marion Hammett.

The unique format of presentation followed by discussion groups received rave reviews, and networks of clinicians quickly formed. Partici-

pants also responded enthusiastically to the Saturday morning case presentations which highlighted some successful fluency programs operating in schools in several states.

The videotapes of students in pre and post intervention sequences were dramatic and reinforced the important role of school speech-language



Cameramen Patrick Richmond and Rene Koopman tape sessions which will be edited and available from SFA in 1998 as part of its new video library.



Attendees continue discussions during luncheons.

pathologists for children and adolescents who stutter.

Monyette W. Cunningham of Birmingham, Alabama, remarked, "It was the most informative conference I have ever attended, as well as the most enjoyable." Added Ricky W. Burk, Ph.D., of Memphis, "The competency, enthusiasm, sensitivity, friendliness, and collegiality of the presenters were commendable."

Tommie M. Young of Knoxville, Tennessee, expressed her appreciation in a letter to SFA. "I found the information dispensed to be very enlightening...it is good to know that this organization will continue to give clinicians as well as other interested parties a floor for sharing and growth," she said.

Next year's conference for professionals working in the school setting will take place in Newport Beach, California, on June 5th and 6th and will be co-sponsored by the California Speech-Language-Hearing Association. □



Dr. Barry Guitar's presentation.



Dr. Pearl Gordon leads discussion group.



Dr. Walter Manning introduces speaker Mary Johns.



Conference Speakers and Discussion Group Leaders: Standing: Kristin Chmela, Hugo Gregory, Joe Fulcher, Charles Healey, Bill Murphy, Peter Ramig, Pearl Gordon, Edward Conture, Mary Johns, Walter Manning; Seated: Ellen Bennett, Ann McKeehan, Barbara Moore-Brown, Jane Fraser, June Campbell, Patricia Zebrowski, Barry Guitar

For Combined Federal Campaign donors, please note that our code number for the 1996-1997 CFC campaign is **CFC #2539.**

Neurobiologic Substrates of Stuttering

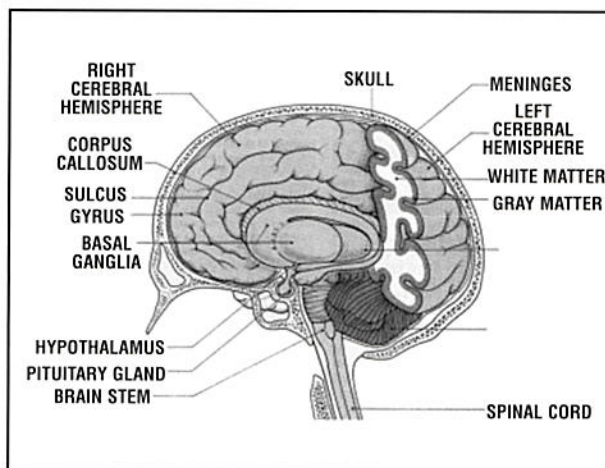
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conduct four experiments that investigate the relationship of behavioral asymmetries to volumetric magnetic resonance imaging (MRI) measurements of anatomic brain asymmetries in people who stutter and in nonstutterers. A group of 120 subjects will be studied over a five-year period. Subjects will consist of 30 right handers who stutter and 30 left handers who stutter. An equal number of right and left handers who do not stutter will also be studied. All subjects will be given a neurolinguistic battery, a handedness inventory, and a stuttering severity instrument. Each subject will receive a volumetric MRI scan of the head, which is a gapless series of thin sagittal sections. This type of MRI differs from conventional MRI scans that are performed for clinical reasons. This type of MRI acquisition allows us to perform computerized quantitative measurements of different brain regions, and enables us to render three dimensional reconstructions of the surface anatomy of the brain. Using these advanced methodologies, we can visualize the brain in vivo and correlate behaviors with measurements of brain regions.

The major postulate of our study is similar to that of Orton (1927) and Travis (1931). That is, we predict that people who stutter will vary from the most typical or standard behavioral and anatomical asymmetries. Specifically, behaviors and anatomical asymmetries of speech, language and motor systems will be studied. Since the work of Paul Broca (1864) and Carl Wernicke (1874), it has been known that the two most important neuroanatomical areas for speech are the anterior perisylvian region (Broca's area), which includes the pars triangularis and pars opercularis, and the posterior portion of the superior temporal gyrus (Wernicke's area). Several studies, including studies performed in our lab, have not only demonstrated hemispheric asymmetries in these structures, but have also demonstrated a strong functional-anatomic correlation.

Stuttering is probably not a unitary process. Subtypes of people who stutter may differ in motor or linguistic variables that may be reflected in atypical asymmetries in anterior speech-language regions, in posterior speech-language regions, and in cortical and subcortical motor areas. Motor speech functions will be studied in

Experiment I by investigating the relationship of speech production to asymmetries in anterior perisylvian regions (Broca's area). In Experiment II, we will study the relationship of speech perception to asymmetries of posterior speech-language regions



(Wernicke's area). In Experiment III, we will investigate the relationship of manual dexterity and skill to asymmetries in cortical and subcortical motor areas. Other factors, such as hand preference, may account for some subtypes of people who stutter. In Experiment IV, all of the previously described paradigms will be repeated in a group of left handers and left handers who stutter. Gender differences may also contribute to individual and group differences, and therefore gender differences will be investigated.

We are currently recruiting subjects for this study. All subjects will be screened by a phone interview, and will sign informed consent prior to enrollment in the study. The experimental procedures and volumetric MRI scan will be performed at Tulane University

School of Medicine in New Orleans, Louisiana. All records, data, and MRI scans will be numbered, and strict confidentiality will be maintained. There are no significant risks to subjects participating, and there is no risk of radiation exposure with the MRI scan

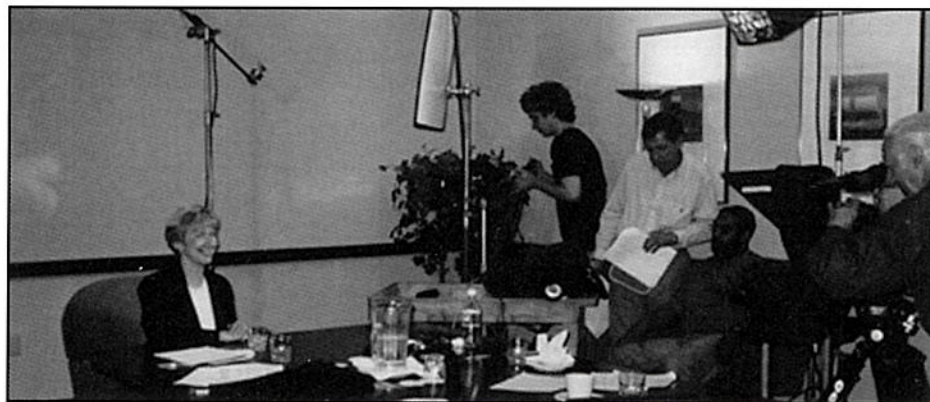
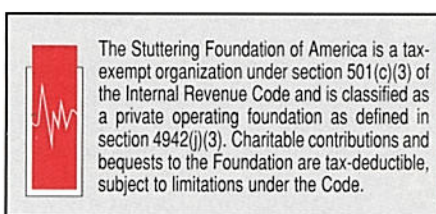
because MRI scans do not involve any radiation as is used in conventional X-rays. Subjects that complete the experiments will be offered \$30 remuneration as a token of gratitude for their willingness to participate. Compensation is also provided to defray the costs of travel, meals, parking, and other inconveniences.

If you are interested in participating, or if you have any questions or comments, contact Dr. Anne Foundas at the following address, phone number, or via email:

Department of Psychiatry and
Neurology
Tulane University School of Medicine
1430 Tulane Avenue
New Orleans, LA 70112-2699

Phone: 504-595-5605 (Voice Mail
and Evenings, ask for Cassie
Browning), 504-588-5734
(Days, ask for Laura Cardin)

email: foundas@mailhost.tcs.tulane.edu



Lights, Camera, Action

Dr. Patricia Zebrowski being filmed for SFA's newest videotape, *Therapy in Action: The School-Age Child Who Stutters*, which will be available this fall. In background are Producer Buddy Morgan holding the script, sound technician Patrick Richmond, and cameraman Rene Koopman.

Malcolm Fraser Award

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disorders, both here and abroad, he is acknowledged widely as an early and forceful advocate for training of clinicians who want to specialize in stuttering.

Other professionals at the ASHA conference underscored the generous relationships that Dr. Gregory established with younger colleagues over the years. "He has made a tangible impact on the next generation of fluency specialists," noted Dr. Jennifer Watson of Texas Christian University who nominated Gregory for the Award. "He has deeply enriched our field."

In accepting the Award, Dr. Gregory observed that "Malcolm Fraser demonstrated a relentless determination to explore and evaluate ways of helping others who are affected by this speech disorder. He communicated what he was learning to hundreds of thousands of parents, teachers, therapists and stutterers themselves."

Gregory added, "It is the highlight of my professional life to be selected by my peers as the first recipient of this Award."

The Malcolm Fraser Award was created by the nonprofit Stuttering Foundation of America as a way to annually recognize an individual who has achieved professional excellence in the field of stuttering.

It is named for the late founder of the Foundation, Malcolm Fraser, who overcame his own speech difficulties to spend a lifetime helping countless others throughout the world. The Foundation, inspired by Fraser's



SFA Board members Jean Gruss and James Spurlock present Malcolm Fraser Award to Dr. Hugo H. Gregory.

vision and support, is celebrating its 50th anniversary this year. It distributes over 500,000 books, brochures, and videotapes on stuttering worldwide each year.

NEWS BRIEFS

■ Next year's SFA conference on the school-age child who stutters will be co-sponsored with the California Speech-Language-Hearing Association and held in Newport Beach, California, on June 5th and 6th, 1998. For more information, contact SFA at 1-800-992-9392. Conference coordinator will be Dr. Judy Montgomery.

■ The annual "Stuttering Therapy: Workshop for Specialists" co-sponsored by the Stuttering Foundation and Northwestern University will be held at Northwestern University in Evanston, Illinois, July 13-24, 1998. For more information about the workshop, contact the Stuttering Foundation at 1-800-992-9392, or Dr. Hugo

Gregory, Stuttering Programs, Northwestern University, 2299 Campus Drive North, Evanston, IL 60208. This unique workshop brings together speech-language pathologists from all over the world.

■ A new webpage enables people who stutter to find penpals. The service is free. Just go to the www.casafuturatech.com and click on "Penpals Webpage."

■ For those interested in joining Toastmasters International as a way to improve fluency, communication or public speaking skills, their address is: Toastmasters International, Inc., Attention: Membership Department, P.O. Box 9052, Mission Viejo, CA

92690, Telephone: (714) 858-8255; Fax: (714) 858-1207.

■ For those looking to obtain a copy of *Self-Therapy for the Stutterer* in Japanese, write to Dr. Shokichi Nakajima, 2-21-1 Ogawa Machida-shi, Tokyo 194, Japan, telephone/ fax: 0427 (96) 5092.

■ For those looking to obtain a copy of *Self-Therapy for the Stutterer* in French, write to the Association des Begues du Canada, 7801 Rue Ste. Claire, Montreal, Quebec, Canada, H1L 1V8. Please enclose \$15.00 Canadian to cover printing, postage, and handling costs.

■ *Elements of Stuttering* by Courtney Stromsta, Ph.D. This book, described by Dr. Charles Van Riper as "something exciting" is available from Atsmore Publishing Company, P.O. Box 533, Oshkosh, MI 49077. Please send \$19.50 plus \$3.00 handling charge for the 256-page book which is fully indexed and includes 33 figures and tables.

■ Dr. Daniel Weiss is looking for adults who stutter in the greater Cleveland area interested in participating in a clinical trial. The study is a placebo controlled double blind 32-week trial of fluoxetine. Medication and participation will be provided free of charge. Interested persons contact Daniel Weiss, M.D., at 216-292-6150.

New Books on Stuttering Available from Bookstores:

■ *Clinical Decision Making in the Diagnosis and Treatment of Fluency*

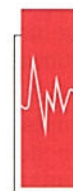
Disorders by Walter H. Manning, Ph.D., published by Delmar Publishers, Albany, New York.

■ *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.

■ *Straight Talk on Stuttering, Information, Encouragement, and Counsel for Stutterers, Caregivers, and Speech-Language Clinicians* by Lloyd M. Hult, Ph.D. The publisher is Charles C. Thomas, Springfield, Illinois.

■ *Stuttering and Science* by William H. Perkins, Ph.D. It is published by Singular Publishing Group, Inc., in San Diego, California.

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



**STUTTERING
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Since 1947—Helping Those Who Stutter

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