BIOGRAPHICAL SKETCH

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NAME: CONTURE, EDWARD

eRA COMMONS USER NAME (agency login):

POSITION TITLE: Professor Emeritus, Hearing & Speech Sciences

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Emerson College, Boston, Massachusetts	BS	06/1967	Communication Sciences & Disorders
Northwestern University, Evanston, Illionois	MA	08/1968	Speech-Language Pathology
University of Iowa, Iowa City, Iowa	PHD	12/1972	Speech-Language Pathology
Nijmegen Institute for Cognition and Information, Nijmegen, Gelderland	Other training	06/1995	Visiting Researcher

A. PERSONAL STATEMENT

My relevance to the present application includes: (1) thirty-five years of experience conducting a program of empirical study (nearly continuously funded by NIH and the DE) into the onset, development and maintenance of stuttering in young children, the age group to be studied in the proposed application; (2) numerous contributions to science (see C. Contributions to Science for examples) resulting from this program that have been integral to the development of a data-based, comprehensive account of childhood stuttering, the disorder to be studied in the application; and (3) the past 12 years of empirical study of emotional contributions to early childhood stuttering, the domain to be investigated in the present proposal.

Focusing on the most recent portion of our program of study (2003-to present), we have empirically investigated possible emotional and linguistic contributions to childhood stuttering. For some time, children who stutter have been considered relatively passive respondents to environmental experiences even though empirically-supported models of child development suggest that children are active agents in their own development. Thus, we have attempted to clarify how individual differences in emotional reactivity, emotional regulation and speech-language abilities enable children to be active agents in their own development. Findings to date strongly suggest that both behavioral and physiological aspects of emotional processes are associated with the onset, exacerbation and maintenance of childhood stuttering (e.g., Choi, Conture, Walden, Lambert & Tumanova, 2013; Jones, Buhr, Conture, Tumanova, Walden, & Porges, 2014).

In summary, the quantity and quality of my scholarly contributions resulting from our program of study, including those of my present and past PhD students and postdoctoral fellows, have significantly contributed to both a data-based, comprehensive understanding of developmental stuttering and theoretical accounts of this speech-language disorder. Now, as Professor Emeritus (Vanderbilt University), I continue to pursue opportunities to contribute to this potentially ground-breaking line of investigation, an interdisciplinary collaboration between speech-language pathology and developmental psychology. This collaboration attempts to bring emotion

processes into the causal/contributory/exacerbational nexus of stuttering along with motoric, linguistic, cortical, etc. processes, an endeavor that should open the tent of accounts of stuttering to potential interactions among these processes and thus shed new light on a relatively old disorder.

1. Walden TA, Frankel CB, Buhr AP, Johnson KN, Conture EG, et al. Dual diathesis-stressor model of emotional and linguistic contributions to developmental stuttering. J Abnorm Child Psychol. 2012 May;40(4):633-44. PubMed PMID: 22016200; PubMed Central PMCID: PMC3740566.
2. Johnson KN, Conture EG, Walden TA. Efficacy of attention regulation in preschool-age children who stutter: a preliminary investigation. J Commun Disord. 2012 Jul-Aug;45(4):263-78. PubMed PMID: 22560538; PubMed Central PMCID: PMC3695708.
3. Conture EG, Kelly EM, Walden TA. Temperament, speech and language: an overview. J Commun Disord. 2013 Mar-Apr;46(2):125-42. PubMed PMID: 23273707; PubMed Central PMCID: PMC3630249.
4. Ntourou K, Conture EG, Walden TA. Emotional reactivity and regulation in preschool-age children who stutter. J Fluency Disord. 2013 Sep;38(3):260-74. PubMed PMID: 24238388; PubMed Central PMCID: PMC3834351.

B. POSITIONS AND HONORS

Positions and Employment

1971 - 1997	Lecturer to Full Professor, Syracuse University, Syracuse, NY
1992 - 1994	Chair, Communication Sciences and Disorders, Syracuse University, Syracuse, NY
1997 - 2011	Director, Graduate Studies, Hearing & Speech Sciences, Vanderbilt University, Nashville, TN
1997 - 2013	Professor, Hearing & Speech Sciences, Vanderbilt University, Nashville, NY
2013 -	Professor Emeritus, Hearing & Speech Sciences, Vanderbilt University, Nashville, NY

Other Experience and Professional Memberships

1972 -	Member, American Speech, Language and Hearing Associaton
1972 -	Reviewer., ASHA Journals, Journal of Fluency Disorders, etc.
1980 - 1981	Member, NIH Task Force, Strategic Research Plan, NIDCD
1980 - 1983	Associate Editor, Journal of Speech and Hearing Research
1985 - 1987	Member, ASHA Publication Board
1991 - 1994	Member, CMS Study Section, NIH/NIDCD
1993 - 1993	Member, Exper Panel on Speech and Speech Disorders, NIDCD Task Force
1994 - 1997	Treasurer, International Fluency Association
2004 - 2008	Editor, Journal of Fluency Disorders
2004 - 2008	Member, NIDCD Advisory Board
2011 - 2012	Guest Editor, Language, Speech, Hearing Services in the Schools

Honors

1986	Distinguished Achievement Award, New York State Speech Language Hearing Association
1988	Clinical Achievement Award, American Speech-Language-Hearing Foundation
1991	Fellow, American Speech, Language, and Hearing Association
1993	Margaret O. Slocum, Professor of Education, Endowed/Named Chair, College of Education, Syracuse University
2003	Malcolm Fraser Award, Stuttering Foundation of America
2005	Honors, National Student Speech Language Hearing Association

2005	Frank R. Kleffner Clinical Career Award, American Speech and Hearing Foundation
2007	Distinguished Alumni Award, Dept. Speech Pathology and Audiology, University of Iowa
2007	Honors of the Association, American Speech Language Hearing Association
2010	Candidate, Fulbright Specialist Roster
2011	Grantee, Global/Public Health, Bulgaria, Fulbright Specialist Program
2012	Invited Jury Member, PhD Dissertation Committee, Lessius University, Belgium and Tilberg University, The Netherlands

C. Contribution to Science

1. Laryngeal aspects of stuttering in adults and children. Until the 1970's, research into the motoric aspects of stuttering mainly focused on non-laryngeal events, for example, acoustic, physiological, etc. studies of disturbances in speech sound articulation, production, etc. This changed in the 1970's because: (1) developing technology, in particular, the flexible fiber optic naso-laryngoscope and (2) a highly controversial book entitled "Stuttering Solved," whereby laryngeal processes were considered central to instances of stuttering. As first author and/or principal investigator of a program of study regarding laryngeal behavior and stuttering, we reported (in one of the first empirical studies of its kind) that laryngeal disruptions were indeed associated with stuttering, but were moderated by both the voicing demands of the sound(s) being stuttered as well as the type of stuttering being produced, for example, sound/syllable repetition versus sound prolongation. Thus, our findings indicated that laryngeal activity/behavior, rather than being the solution for stuttering, are indeed part and parcel of stuttering and thus need to be considered in any data-based, comprehensive account/description of stuttering.
   a. Conture EG, McCall GN, Brewer DW. Laryngeal behavior during stuttering. J Speech Hear Res. 1977 Dec;20(4):661-8. PubMed PMID: 604680.
   b. Metz DE, Conture EG, Caruso A. Voice onset time, frication, and aspiration during stutterers' fluent speech. J Speech Hear Res. 1979 Sep;22(3):649-56. PubMed PMID: 502520.
   c. Conture EG, Schwartz HD, Brewer DW. Laryngeal behavior during stuttering: a further study. J Speech Hear Res. 1985 Jun;28(2):233-40. PubMed PMID: 4010253.
   d. Conture EG, Rothenberg M, Molitor RD. Electroglottographic observations of young stutterers' fluency. J Speech Hear Res. 1986 Sep;29(3):384-93. PubMed PMID: 3762102.
2. Behavioral and motoric aspects of childhood stuttering. Between roughly 1960-1980, several theoretical models of stuttering, (e.g., VanRiper's [1972] temporal discoordination hypothesis) strongly suggested that disruptions in speech motor control were central to stuttering. Building on our previously mentioned empirical study of laryngeal activity associated with (dis)fluent speech, as a PI of a competitive NIH contract (starting in 1980), I began to focus on the contributions such motoric processes made to early childhood stuttering, the time period when stuttering typically begins and learned behavioral, cognitive, and emotional reactions are at a minimum. Focusing mainly on temporal aspects of these motoric processes, given the theoretical models of that period, our findings indicated that young children who stutter (CWS) did not exhibit clear evidence of temporal discoordinations during their fluent speech production. Results did show, however, that CWS exhibited some subtle physiological disruptions during fluent speech production (e.g., labial muscles for closing and opening lips being more coactive). These findings were consistent with those relating to coactivation of abductory and adductory laryngeal muscles during the stutterings of adults who stutter. Overall, our findings suggested that physiological disruptions, albeit sometimes subtle, occur during both fluent and disfluent speech of people who stutter. Although intriguing, our findings left open to question whether such disruptions are part of stuttering or its proximal cause. In addition, concomitant sub-grouping (via means of hierarchical cluster analyses) of young CWS – one of the first studies of its kind - indicated that these children could be sub-typed into 4

distinct behavioral groupings; however, our subsequent findings indicated no meaningful relation between behavioral and physiological indices. While the empirical study of motoric contributions to stuttering continues, our program of study has moved into other areas of empirical study, as described below.

a. Caruso A, Conture E, Colton R. Selected temporal parameters of coordination associated with stuttering in children. Journal of fluency disorders. 1988; 13:57-62.
b. Schwartz HD, Conture EG. Subgrouping young stutterers: preliminary behavioral observations. J Speech Hear Res. 1988 Mar;31(1):62-71. PubMed PMID: 3352256.
c. Conture EG, Colton RH, Gleason JR. Selected temporal aspects of coordination during fluent speech of young stutterers. J Speech Hear Res. 1988 Dec;31(4):640-53. PubMed PMID: 3230894.
d. Conture EG, Kelly EM. Young stutterers' nonspeech behaviors during stuttering. J Speech Hear Res. 1991 Oct;34(5):1041-56. PubMed PMID: 1749234.

3. Phonology, language and childhood stuttering. As our and other researchers' empirical studies of speech production progressed, during the 1990's and for the next two decades, theory relating to contributions to speech and language planning to stuttering emerged. Although this perspective did not eschew motoric contributions to stuttering, it did lead several researchers, including myself, to question whether the covert or more "upstream" plan(s)for speech-language might also contribute to instances of stuttering. Accordingly, as principal investigator, a two-part program of study was developed involving: (1) empirical study of differences in overt speech-language abilities of children who do (CWS) and do not stutter (CWNS) and (2) experimental studies using psycholinguistic theory and method to determine whether covert linguistic processes of CWS differed from those of their normally fluent peers. Notable among part (1) findings, was that (a) CWS, when compared to CWNS, exhibited unevenness (i.e., dissociations) among the various aspects of their speech-language abilities, a replicated finding, (b) CWS's tendency to stutter on utterance-initial words was moderated by the length of the utterance, and (c) CWS were on average 0.5 standard deviations lower on various tests on expressive and receptive language and vocabulary than CWNS. Part (1) of this program of study has contributed to a comprehensive account of the association of speech-language processes and childhood stuttering, ongoing work that has had appreciable implications for theoretical explanations as well as continued empirical study of stuttering.
   a. Yaruss JS, Conture EG. Stuttering and phonological disorders in children: examination of the Covert Repair Hypothesis. J Speech Hear Res. 1996 Apr;39(2):349-64. PubMed PMID: 8729922.
   b. Logan KJ, Conture EG. Selected temporal, grammatical, and phonological characteristics of conversational utterances produced by children who stutter. J Speech Lang Hear Res. 1997 Feb;40(1):107-20. PubMed PMID: 9113863.
   c. Coulter CE, Anderson JD, Conture EG. Childhood stuttering and dissociations across linguistic domains: a replication and extension. J Fluency Disord. 2009 Dec;34(4):257-78. PubMed PMID: 20113770; PubMed Central PMCID: PMC2818587.
   d. Ntourou K, Conture EG, Lipsey MW. Language abilities of children who stutter: a meta-analytical review. Am J Speech Lang Pathol. 2011 Aug;20(3):163-79. PubMed PMID: 21478281; PubMed Central PMCID: PMC3738062.
4. Psycholinguistic aspects of childhood stuttering. With some exceptions (e.g., Yaruss & Conture, 1996), the preceding studies of phonology and language of children who stutter, did not formerly, or at least extensively, test extant theoretical models. This state of affairs changed with the publication of Postma and Kolk's (1993) covert-repair hypothesis of stuttering (importantly related to Levelt's 1989 psycholinguistic model of speech-language). Becoming increasingly convinced of the importance to stuttering of events "upstream" of speech motor control (i.e., phonological, lexical and syntactic processes), I spent a year (1994-1995) studying with Dr. Herman Kolk (Nijmegen Institution for Cognition and Information, Nijmegen [now Radboud] University) about psycholinguistic theory and methodology. Thus, in

Part (2), we conducted a series of implicit (automatic) priming experiments (e.g., the prime picture "dog" leads to faster naming of subsequent picture of "cat" than does the prime picture "knife"), based on the psycholinguistic theory and method I learned from Dr. Kolk and his colleagues in Nijmegen. Findings indicated that young CWS, when compared to their normally fluent peers, exhibit (1) subtle, but significant difference in syntactic and lexical processes, (2 different relations between articulatory abilities and speed of picture-naming and (3) more holistic than incremental sound(s) or sound sequence processing. These findings, although not a one-size-fits-all explanation of stuttering, underscored the need to consider "upstream" speech-language planning in addition to "downstream" production when accounting for childhood stuttering, suggesting the relevance of psycholinguistic theory and method to a comprehensive account of stuttering.

a. Melnick KS, Conture EG, Ohde RN. Phonological priming in picture naming of young children who stutter. J Speech Lang Hear Res. 2003 Dec;46(6):1428-43. PubMed PMID: 14700366.
b. Anderson JD, Conture EG. Sentence-structure priming in young children who do and do not stutter. J Speech Lang Hear Res. 2004 Jun;47(3):552-71. PubMed PMID: 15212568; PubMed Central PMCID: PMC1458370.
c. Pellowski MW, Conture EG. Lexical priming in picture naming of young children who do and do not stutter. J Speech Lang Hear Res. 2005 Apr;48(2):278-94. PubMed PMID: 15989392.
d. Byrd CT, Conture EG, Ohde RN. Phonological priming in young children who stutter: holistic versus incremental processing. Am J Speech Lang Pathol. 2007 Feb;16(1):43-53. PubMed PMID: 17329674.

5. Emotion and childhood stuttering. Almost from the initial empirical studies of stuttering in children, teens and adults (late 1800 to early 1900's), emotional processes have been thought to play an important role. Certainly, my 40+ years of research and clinical experience with people who stutter strongly suggested to me that emotion was somehow related to stuttering. After publishing our first thoughts on this (Conture, 1991), it would be another 10-13 years before, in parallel with our psycholinguistic studies, we would develop sufficient theoretical and procedural expertise to embark on systematic study of emotion and childhood stuttering. As principal investigator, in 2003, we published our first empirical study in this area (Anderson, Pellowski, Conture & Kelly, 2003), work that continues. Among our findings – using parent report-based questionnaires of children's temperament/emotional development as well as coded behavioral observations and psychophysiological measures during experimental paradigms – young CWS have been shown to have lower levels of emotional regulation, higher levels of emotional reactivity, and more negative reactivity to disappointment and frustration than their CWNS peers. Likewise, we found that young CWS, when compared to CWNS, produce more physiological coactivity, that is, higher sympathetic concurrent with higher parasympathetic activity, and more coinhibition, that is, low sympathetic concurrent with low parasympathetic activity. Interestingly, results of several of our empirical studies indicated that greater duration and/or number of emotional regulation strategies was significantly correlated with lesser stuttering frequency. Thus, it now seems appropriate, based on results of approximately 20 published empirical studies, to consider including emotion in the contributory nexus of stuttering along with cortical, linguistic, motoric, etc. processes. Such inclusion, as suggested above, should open the tent of accounts of stuttering to potential interactions among these processes and thus shed new light on a relatively old disorder.

a. Anderson JD, Pellowski MW, Conture EG, Kelly EM. Temperamental characteristics of young children who stutter. J Speech Lang Hear Res. 2003 Oct;46(5):1221-33. PubMed PMID: 14575354; PubMed Central PMCID: PMC1458369.
b. Karrass J, Walden TA, Conture EG, Graham CG, Arnold HS, et al. Relation of emotional reactivity and regulation to childhood stuttering. J Commun Disord. 2006 Nov-Dec;39(6):402-23. PubMed PMID: 16488427; PubMed Central PMCID: PMC1630450.
c. Johnson KN, Walden TA, Conture EG, Karrass J. Spontaneous regulation of emotions in preschool children who stutter: preliminary findings. J Speech Lang Hear Res. 2010 Dec;53(6):1478-95. PubMed PMID: 20643793; PubMed Central PMCID: PMC3800203.

d. Jones RM, Buhr AP, Conture EG, Tumanova V, Walden TA, et al. Autonomic nervous system activity of preschool-age children who stutter. J Fluency Disord. 2014 Sep;41:12-31. PubMed PMID: 25087166; PubMed Central PMCID: PMC4150817.

D. RESEARCH SUPPORT

Ongoing Research Support

1996/07/01-2015/07/31
R01 DC000523-14A2, National Institute on Deafness and Other Communication Disorders (NIDCD)
CONTURE, EDWARD Gage (PI)
Emotional and Linguistic Contributions to Developmental Stuttering
Role: PI

1996/07/01-2015/07/31
R01 DC000523-15, National Institute on Deafness and Other Communication Disorders (NIDCD)
CONTURE, EDWARD Gage (PI)
Emotional and Linguistic Contributions to Developmental Stuttering
Role: PI