

PROMOTION RECOMMENDATION  
THE UNIVERSITY OF MICHIGAN  
MEDICAL SCHOOL  
DEPARTMENT OF PSYCHIATRY

Soo-Eun Chang, Ph.D., assistant professor of psychiatry, Department of Psychiatry, Medical School, is recommended for promotion to associate professor of psychiatry, with tenure, Department of Psychiatry, Medical School.

Academic Degrees:

Ph.D.	2005	University of Illinois
M.S.	1999	Vanderbilt University
B.A.	1996	Seoul National University

Professional Record:

2013 – present	Assistant Professor of Psychiatry, University of Michigan
2013 – present	Adjunct Professor of Psychology, Michigan State University
2013 – present	Adjunct Professor of Communicative Sciences and Disorders, Michigan State University
2009-2013	Assistant Professor of Communicative Sciences and Disorders, Michigan State University

Summary of Evaluation

Teaching: Dr. Chang devotes approximately 40% of her effort to teaching activities and mentorship within the classroom, laboratory and undergraduate and graduate student seminars. She runs an active research laboratory at the University of Michigan and Michigan State University campuses. Dr. Chang mentors an average of three undergraduate students per semester at the University of Michigan guiding them through Undergraduate Research Opportunity Program projects, honors thesis and other research training. She mentors an average of three undergraduate students per semester at Michigan State University related to research activities in speech and language transcripts and behavioral data analysis. As a testament to her teaching and mentoring, Dr. Chang has mentored a research investigator who received an NIH R21 grant as the principal investigator and then moved on to an independent research position. Most of her mentees have gone on to successfully present at conferences, engaged in pilot studies leading to a grant application, or have served as co-authors on manuscripts being prepared for publication based on independent projects conducted within the lab. She teaches didactically at the University of Michigan and Michigan State University as course instructor or an invited lecturer. Dr. Chang's students are trained on how to conduct literature searches and reviews, generate research ideas, design experiments, implement scrupulous procedures for data collection, and careful data analysis. She also holds informal journal clubs that focus on the review of literature related to active projects which are on-going in the lab.

Research: Dr. Chang has been successful in obtaining external grant funding. Her research program aims to advance the scientific understanding of the neural bases of stuttering, a complex neurodevelopmental disorder affecting 1% of the population. Combining pediatric multimodal neuroimaging, comprehensive behavioral assessments, and longitudinal study design, her research

has been at the forefront in making novel discoveries on neural risk factors for childhood stuttering and developmental trajectories leading to chronic stuttering versus natural recovery. This work has been supported by a renewed NIH R01 grant and has led to high impact publications, including three papers in the journal *Brain*. Since joining the University of Michigan, Dr. Chang has contributed to new areas in stuttering that have led to four recent NIH R21 grants funding for these new directions. She has expanded into intervention research with high definition transcranial direct current stimulation (HD-tDCS), which has led to the first randomized control trial of HD-tDCS applied to stuttering speakers, currently underway. Dr. Chang is the principal investigator of an NIH R01 grant which supports research on the longitudinal study of brain developmental trajectories associated with stuttering persistence and recovery. In particular, this grant supports the first longitudinal study of brain development in stuttering children. Dr. Chang's longitudinal work has provided first glimpses into early neural risk factors associated with persistent stuttering, and developmental changes that lead to natural recovery. She has partnered with psychiatry methods core to apply advanced whole-brain connectomics methodology for the first time in this clinical population in order to examine large scale network differences in the brains of children who stutter (CWS). This work has also led to a related funded study involving CWS examining with fMRI the functional connectivity of brain regions during speech planning and production. She is using a cutting edge approach, developed in her lab, that effectively controls for movement artifacts associated with overt speech production during fMRI scanning. Since stuttering is a highly heritable disorder, genetics is likely to contribute to the brain anomalies associated with stuttering. However, to date, this proposition has not been tested. Supported by an R21 grant, Dr. Chang is currently recruiting discordant twins who stutter to examine genetic verses environmental factors. She has published 28 peer-reviewed articles.

#### Recent and Significant Publications:

Chang S, Angstadt M, Chow H, Etchell A, Garnett E, Choo A, Kessler D, Welsh R, Sripada C: Anomalous network architecture of the resting brain in children who stutter. *Journal of Fluency Disorders*. Jan 25:46-67 Jan 2018.

Chow H, Chang S: White matter developmental trajectories associated with persistence and recovery of childhood stuttering. *Human Brain Mapping*, 38(7): 3345-3359, 2017.

Chang S, Chow H., Wieland L, McAuley J: Relation between functional connectivity and rhythm discrimination in children who do and do not stutter. *NeuroImage: Clinical*. 2016;12:442- 450, 2016.

Chang S, Zhu D, Choo A, Angstadt M: White matter neuroanatomical differences in young children who stutter. *Brain*, 138(Pt 3):694-711, 2015.

Chang S, Zhu D: Neural network connectivity differences in children who stutter. *Brain*, 136 (12), 3709-3726, 2013.

Service: In 2013, Dr. Chang was appointed as the Rosa Casco Solano-Lopez Endowed Professor of Child and Adolescent Psychiatry in the Department of Psychiatry at the University of Michigan. She has been invited by the American Speech-Language-Hearing Association (ASHA), her field's main professional organization, to serve in various roles. She is a member of the Fluency Topic

Committee for the ASHA Convention, an ASHA grant review and reviewer training invited reviewer, and she serves on the ASHA focus group on communication with researchers. Dr. Chang has served on the conference organizing committee of the Oxford Dysfluency Conference, United Kingdom, one of the premier meetings in stuttering. In 2015, she received the Elizabeth Caroline Crosby Research Award and the Editor's Choice award for her article 'White matter neuroanatomical differences in young children who stutter (Chang et al., 2015)' published in the journal of *Brain* and featured on the cover of the magazine. Since 2009, Dr. Chang has been an ad hoc reviewer for 31 journals including *Brain*, *American Journal of Speech-Language Pathology*, *Human Brain Mapping* and *Neuropsychopharmacology*. She is a reviewer and on the editorial board for *Frontiers in Auditory Cognitive Neuroscience*.

#### External Reviewers:

Reviewer A: "...I consider Dr. Chang as one of the top researchers in the field of speech-language pathology, in particular because of her outstanding and ground-breaking work in studying the neurological underpinnings of developmental stuttering... More impressive even is the quality of the journals in which many of these publications are published... she is combining some of the most advanced analysis techniques in brain imaging with highly sophisticated statistical analysis methods... her research already has had a significant impact on advancing our understanding of the nature and development of developmental stuttering and I am confident that she will continue on this track and that her stature as one of the top researchers in our field will only continue to grow... She is a scientific star and will continue to lead the field in the years to come... I cannot think of a single individual that I have assessed for tenure in the last 10 years who I would endorse more strongly than Dr. Chang."

Reviewer B: "Dr. Chang has taken on a new approach by focusing on children close to the age of onset of the disorder... Dr. Chang's success in such studies has yielded important new information in this field that has focused attention on long-range connectivity deficits in the disorder... Dr. Chang's [sic] has generated a substantial body of published work number 25 peer-reviewed publications... Dr. Chang has displayed a clear focus on stuttering... Dr. Chang has been highly successful in attracting external competitive funding... she has served as Principal Investigator on two NIH R01 grants, one NIH R21 grants [sic], and one grant from the American Speech Language Hearing Association."

Reviewer C: "Dr. Chang has an impressive academic and research career... she has progressed to become an internationally known leader in the field... Dr. Chang is a consummate academic, with a rare combination of abilities. Her research ideas are novel, and cleverly combine neuroscience theory from two or more basic sources... Her research has had a major impact on the field... Her body of research has led to a better understanding of speech and language development, and communication disorders... Many of her students are working in academic settings and are beginning to be recognized in the field... I view her as an exemplary faculty member... She has been effective in building a highly successful research program, while working to teach and mentor students, and to provide service to the academic community."

Reviewer D: "Dr. Chang's research is well-respected in the field and she is considered by my colleagues and me as the leading brain imaging researcher in stuttering today. Her most recent work in elucidating the biomarkers for recovery in children who stutter vs. those who persist into

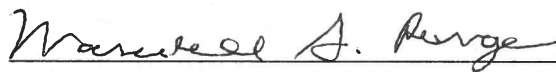
adulthood is quite remarkable...Her *Brain* article in 2013 is quite impactful in our field as well as it provided further evidence to a prior sparse body of knowledge then that stuttering is indeed a neurophysiologic disorder and not one of psychological anxiety as many held.”

Reviewer E: “...it is clear to me that Dr. Chang’s record of research productivity, obtaining extramural support for her research program, mentoring students and postdoctoral fellows, and active engagement in our research community far surpasses that of *all* assistant professors I have previously reviewed for promotion and tenure...my reaction to the detailed record of her accomplishments provided in her CV is simply astonishment...The number of publications is very impressive for her current rank, but what strikes me more than the quantity is the quality of her work. Her papers include landmark studies of the neuroanatomy and neurophysiology of stuttering in childhood...She has published in the best journals in our field...I cite her work more than that of any other neuroscientist working in the field of stuttering...I would say she is the top neuroscientist of her generation doing research in speech production/stuttering...I would say that Dr. Chang’s work, in terms of scientific rigor and impact, surpasses that of any other neuroimaging group working in the area of fluency...This is [the] best record of extramural funding I have seen for an assistant professor...is clearly already a highly respected scholar in our field...I would have nominated her for promotion and tenure earlier than you have done.”

Reviewer F: “Dr. Chang’s scholarly contributions have made a significant impact on how the field thinks about the neural underpinnings of stuttering...Her work is well known in the stuttering research community and is highly regarded...I consider many of her papers to be outstanding...The neural imaging work she has done to examine connectivity in children who stutter, and relate that to eventual recovery or persistence in stuttering has been groundbreaking...Dr. Chang is a leader among her peer group in the field...She is a stand-out in terms of her scientific contributions and leadership.”

Summary of Recommendations:

Dr. Chang has established an independent research program in the field of Communicative Sciences and Disorders and on the neural bases of stuttering. She is an outstanding research-scholar and a highly valued research collaborator. She has an impressive track record in obtaining funding and is making an impact in her field. I am pleased, therefore to recommend Soo-Eun Chang, Ph.D. for promotion to associate professor of psychiatry, with tenure, Department of Psychiatry, Medical School.



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Marschall S. Runge, M.D., Ph.D.  
Executive Vice President for Medical Affairs  
Dean, University of Michigan Medical School

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