Haskins Laboratories
THE SCIENCE OF THE SPOKEN AND WRITTEN WORD

Communiqué

Winter 2019

From the President's Desk

It is a pleasure to introduce our inaugural edition of the Haskins Communiqué newsletter! It is our hope that the Communiqué will become a vehicle for sharing the exciting discoveries and tremendous growth that I am privileged to witness daily in my role as President. This newsletter is a component of the development portfolio taken on by Dr. Julie Van Dyke, who moved into the new role of Vice President for Research and Strategic Initiatives earlier this year. Having served as a Senior Scientist at Haskins for 18 years, and with extesive experience in project management, science communication, and editorial service, she is well qualified to drive forward our strategic goals. We look forward to the creative energy she will bring to this position – and the pages of this newsletter!

I am happy to report that 2019 continued be a year of growth at Haskins. We welcomed 11 new postdoctoral fellows in the last year, bringing with them new ideas and approaches in the areas of language development, reading, and sensorimotor organization of language. In addition to our commitment to training a new generation of language scientists, we continue our commitment to community outreach and bridging the gap between research and practice. The 2019 Summer Institute embodied this mission; the Feature Article (page 4) provides a detailed peek into the exciting dialogue we are fostering between educators and cutting-edge reading scientists. Another groundbreaking development on this theme is our new partnership with two leading schools for children with language-based learning disabilities (The AIM Academy in Philadelphia and The Windward School in Westchester, New York). This ambitious project began earlier this year by installing state-of-the-art cognitive neuroscience research labs at these schools to allow on-going measurement of language and reading development as children progress through an evidence-based curriculum. Under Dr. Nicole Landi's direction, we have now collected extensive brain and cognitive data on a large group of children at each school and we are gaining important insights into individual differences in core learning profiles in this complex population. Look for updates on this initiative in future editions of this newsletter.

This newsletter also highlights the uniqueness of Haskins as an international community; a defining attribute of a lab that cares about the biology of human language in all its variations. Two important partnerships are highlighted here: the announcement of the Haskins Global Literacy Hub (page 2), and the founding of a joint developmental neuroscience lab with the National Taiwan Normal University (page 3). Synergistic relationships across such a wide range of disciplines and among researchers from over 40 countries is what makes Haskins Laboratories so unique and special. As we embark on the year 2020, which marks the 85th anniversary since our founding in 1935, it is a privilege to share our developments in the pages of this newsletter.

Sincerely,

Ken Pugh, Ph.D.
President and Director of Research

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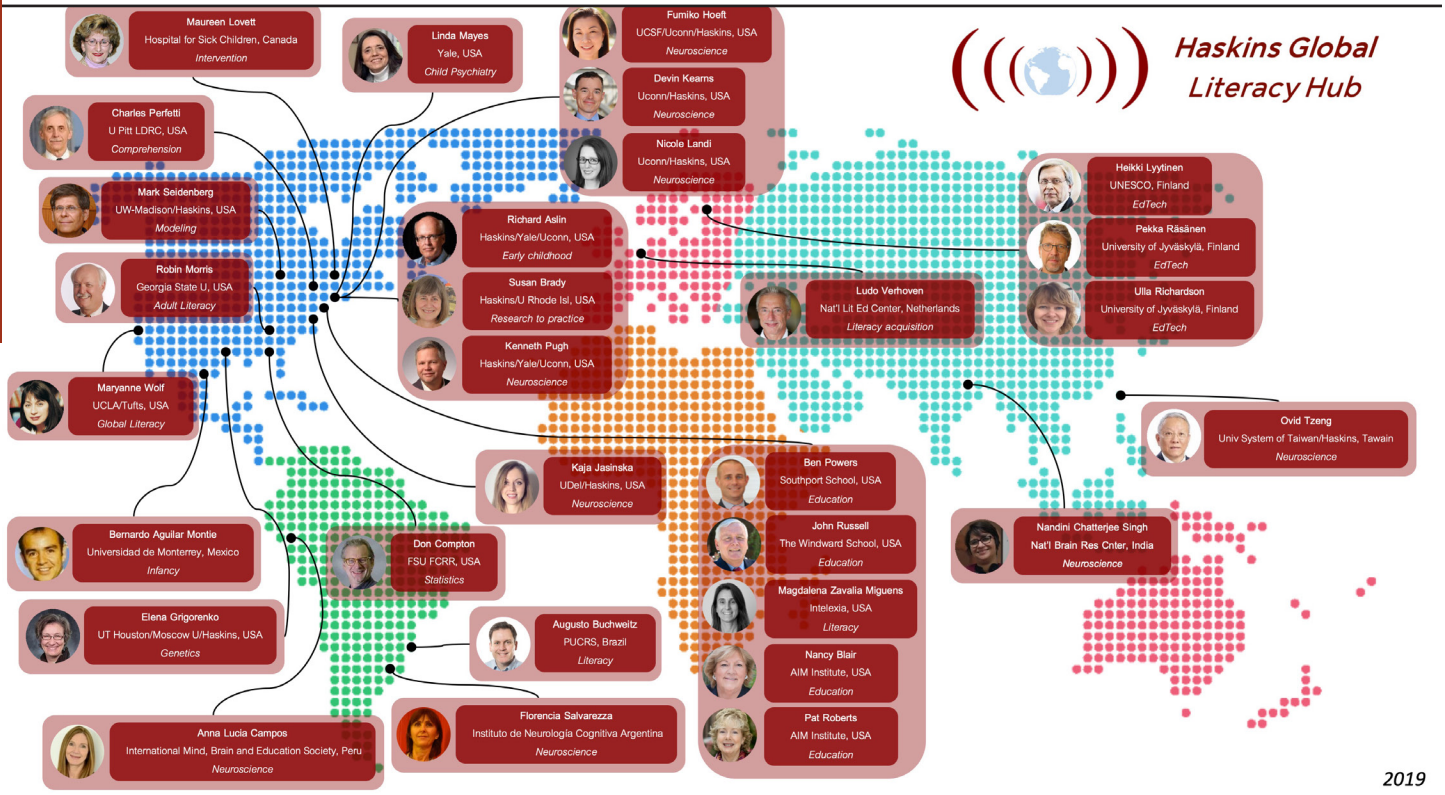
Haskins announces Global Literacy Hub



2019

Official announcement of the Haskins Global Literacy Hub (haskinsglobal.org) was made in Fall 2019. The Hub is a consortium of scientists and educators based throughout the US and spanning 30 international partners, with the aim of exchanging expertise and devising cutting-edge brain-based strategies to serve children at-risk for reading disability in the United States and abroad. The Hub is co-directed by Prof. Kenneth Pugh, President and Director of Haskins Laboratories, and Prof. Fumiko Hoeft, Professor of Psychological Sciences and Director of the Brain Imaging Research Center at University of Connecticut, and Director of the multi-site Laboratory for Learning Engineering and Neural Systems (brainLENS.org) also at the University of California, San Francisco. Pugh and Hoeft note that "the Hub is an exciting example of meaningful collaboration between international researchers, educators, policy makers and technology specialists working together to improve language and reading outcomes in children with environmental or neurocognitive risk factors." The Hub is a response to scientific evidence pointing to literacy as a crucial stepping stone to escaping poverty and leading healthy, productive and fulfilling lives. Its chief goal is to martial evidence-based, technologically rich approaches to improve language and literacy outcomes for at-risk children across the globe. Dr. Ben Powers, head of Southport School, a school-partner in The Southport, CT emphasized that "The Hub is a completely new approach to leveraging the global network of leading literacy researchers in tandem with educators and students. It creates a unique opportunity to provide engagement and interactive dialogue between researchers, educators, and students."

Establishing the Global Need

The Hub is an outgrowth of the Haskins Global Summit, which convened in December 2015 with leading international scientists, representatives from key governmental agencies, non-governmental organizations, and health and educational ministries in the developing world to discuss ongoing activities and needs in the area of early childhood in disadvantaged populations. The Global Summit generated a series of articles by attendees published in a Special Issue of the journal *New Directions for Child and Adolescent Development* published in Winter 2017 entitled "Global Approaches to Early Learning Research and Practice," edited by Ken Pugh, Peggy McCardle, and Annie Stutzman. Articles in this issue addressed literacy issues in Africa, India, and China, as well as how health and economic issues influence literacy outcomes.

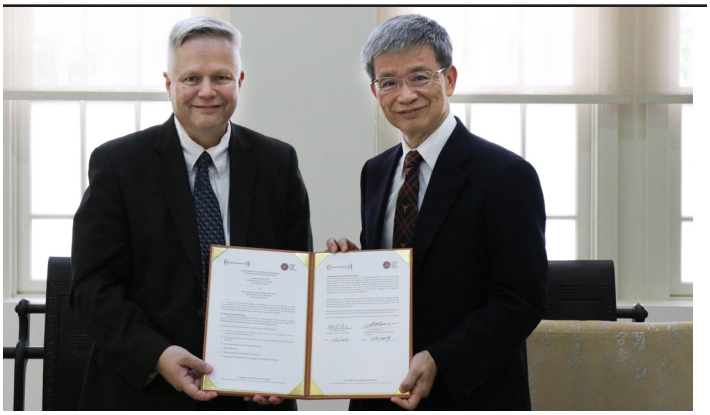
International partners

The Global Literacy Hub is currently composed of over 30 international partners ranging from neuroscientists to education technology specialists to public and private school instructors working together in more than 15 countries across the globe. Projects include collaborations between US and Finnish scientific partners to bring educational technology to public schools in Africa and South America, development of tablet-based early-screening tools for use in English-based elementary schools, development of Spanish-language textbooks and multisensory teaching aids to be deployed in 78 schools throughout Argentina. More generally, the Haskins Global Literacy Hub aims to improve early language assessment in children before they enter school, develop and deploy evidence-based technology on an international scale, and train a new generation of educators and clinicians in neuroscience-guided educational practices.

Where science meets practice

One particularly innovative initiative is the creation of in-school electrophysiology laboratories at The Windward School in Westchester, NY and at the AIM Academy near Philadelphia, PA. These laboratories enable students to simultaneously learn about how the neural basis of reading disability is studied and to enjoy hands-on experience in collecting data both as a researcher and as a participant. Dr. John Russell, Head-of-School at The Windward School emphasized that "bridging the gap between research and instruction through an in-school research partnership presents a unique opportunity for researchers and educators to collaborate." Dr. Russell also noted that becoming a partner in the Global Literacy Hub "enables the Windward School to continue its own vision of making a lasting contribution towards a world where every child with a language-based learning disability is empowered to achieve unlimited success." This pairing of scientists with educators to simultaneously foster scientific and educational progress is a paradigm example of the aims of the Global Literacy Hub.

National Taiwan Normal University and Haskins establish joint laboratory



A joint brain research facility was inaugurated in Taipei on October 4, 2019 with delegates from National Taiwan Normal University (NTNU) and Haskins signing a Memorandum of Understanding outlining the commitment of both institutions to work collaboratively to investigate infant learning. Ovid Tzeng, NTNU chair professor and Haskins Laboratories board member since 2015, told a press conference that the institute will emphasize functional near-infrared spectroscopy in researching language and reading development in infants. The method is a non-invasive optical imaging technique that measures changes in hemoglobin concentrations in the brain. Haskins Senior Scientist Richard Aslin noted that human learning peaks in infancy, and so this is an ideal developmental period in which to investigate how the brain learns. The joint laboratory will explore the early physical signs of infants' cognitive ability and determine methods that can help children who suffer from autism and language development disorders. The inauguration coincided with a workshop incorporating NTNU students, current Haskins post-docs and affiliated scientists, including Heikki Lyytinen, Ram Frost, and Manuel Carreiras.

FEATURED ARTICLE

Haskins Summer Institute builds bridges between scientists and educators

Haskins continued its long-standing commitment to bridging science and educational practice at the 2019 Summer Institute, entitled "The Literate Brain: Linking Researchers with Practitioners," held July 21st-July 25th in New Haven CT. A cohort of 10 general education teachers, special education teachers, and school administrators from locales as diverse as Wyoming, New York, Connecticut, and Pennsylvania came together to learn the latest developments in the science of literacy. A recurring theme during the the week was how crucial the scientific perspective is in helping teachers to improve their instruction. A participant noted, "My experience at the Summer Institute will enhance my decision-making going forward, because a lot of times you don't really know who to trust. There are a lot of programs out there that sound good, but now we can go [to our schools] with more confidence and say 'this is what's really behind how kids learn to read.'

The group benefited from 8 in-depth lectures from leading researchers in the field of reading and speech development, genetics, and educational neuroscience, as well as hands-on tutorials about how to collect electrophysiological brain data. The internationally-recognized faculty team included Haskins-affiliated scientists who have pioneered reading research in their areas of specialty and whose dedication to bridging laboratory science and classroom instruction has led each of them to serve as advisors on numerous panels for the National Institutes of Health and the National Science Foundation, as well as governmental and private advisory boards, and professional organizations, including National Research Council on Learning Sciences, the Dyslexia Foundation, National Center on Improving Literacy, and the International Dyslexia Association. These are the cutting-edge researchers in the science of literacy! See side-panel for summaries of their talks.

In addition to their spoken presentations, the faculty assigned a reading list of recently published scientific research in their area of specialty, and led informal discussions of these results. Commenting

about what she had learned, one participant noted, "One very nice thing about this Institute is that the small cohort made these high-level talks more accessible because of the personal engagement we had with the researchers." Over the course of the week, each participant used the knowledge gained from these experiences to develop their own research question and/or presentation, and received feedback from Haskins Scientists. These individual projects will then be used at their home institutions for professional development and advocacy.

At the end of the week the group reflected on their experience. A participant who travelled from Wyoming noted, "I would encourage making more connections with public school general education teachers because that's the farthest bridge [from science to practice.] A lot of times there isn't always the money to go to programs like this, or for teachers to learn this information. We were very fortunate that our district supported this, but it's really unusual for a public school to send four of us across the country [for teacher training.]" In agreement, another Wyoming-based participant noted, "Gen[eral] ed[ucation] teachers really need this because they are on the front lines of early identification and prevention, as opposed to remediation, but it's the special ed[ucation] instructors who have a leg up because they know what to look for. And by the time a kid comes to them it could be too late."

A literacy advocate in the group commented, "The Summer Institute has empowered me to go back to the whole language [advocates] with a deeper understanding of their position, and a more balanced view of where they are coming from. It will make me more diplomatic with them, and with legislators who always want research-focused programs. Now I can give them recent data and say 'Hey! This hasn't even been published yet, and you get a peak at it!' I've gotten a balanced view and a recent data view that you can't argue with."

A school administrator appreciated that the Institute allowed her "to confirm things that I'd learned from my training, and to get updated. [As a private school administrator,] one of my concerns is how to convince my parents, because these are paying clients. Many of them learned to read using a whole language approach, and I'm trying to shift mindsets so they can see that there's value added to direct instruction."

As a whole the group was eager to continue the dialogue between scientists and educators, and Haskins is excited to be on the forefront of this initiative.

Pattern Playback

PRESENTATION SUMMARIES

JULY 2019

Ben Powers, headmaster at The Southport School, Southport, CT and Co-Director of the Academic Center of Excellence at the Dyslexia Foundation, opened the Institute with a lecture entitled "Academic Research: Fact vs. Fiction", which discussed specific principles needed to evaluate the quality of scientific evidence. Using recent examples of sensationalized statistics (e.g., Low-dose aspirin prevents heart attacks) and spurious correlations (e.g., The divorce rate in Maine correlates near perfectly with the per capita consumption of margarine), Dr. Powers demonstrated how a basic understanding of statistics and scientific method is crucial for evaluating scientific-sounding claims about efficacy of educational techniques.

Ken Pugh, President and Director of Haskins Laboratories, introduced the neuroscience of reading with a comprehensive presentation outlining the distinct and shared neural substrate for reading and speech, the neural characteristics of the dyslexic reader, and new research seeking to identify the neural signature of those who resist vs. those who respond to intervention (RTI). A special treat was the presentation of not-yet-published data comparing effects of different treatment strategies (i.e., blending, rhyming, and sound elision), showing that training in 'peeling off sounds' (elision) leads to much greater activation in the visual-word-form areas of the brain.

Julie Washington, Professor of Educational Psychology and Special Education at Georgia State University, presented a fascinating talk describing the influence of gender and dialect on assessment and literacy attainment in African American children. Dr. Washington pointed to specific areas where dialectal variation leads to over-diagnoses of language deficits because of culturally-indiscriminate standardized testing. Discussion related to the connection between dialect-use and bilingualism, and the specific impact that home language variation may have for instruction. Dr. Washington also presented evidence suggesting that dialect-use had a more deleterious impact on 4th and 5th grade boys, despite identical effects for girls and boys in earlier grades.

Laurie Cutting, Professor of Special Education, Psychology, Radiology, and Pediatrics

at Vanderbilt University presented a talk entitled "The Cognitive and Neurobiological Processes of Reading: Role of Executive Function." Dr. Cutting presented not-yet-published neuroimaging data pointing to the importance of executive function in predicting reading comprehension, but that this role was much greater for expository texts than for narrative texts. Discussion centered around the impact that weak executive function may have for reading, and the possibility that executive training may yet play a role in reading remediation, despite the so-far-inconclusive evidence for its effectiveness.

Elena Grigorenko, Professor of Psychology and Director of the Human Genetics Lab at the University of Houston, spoke about the genetics of developmental language disorders, emphasizing that they are highly heritable, but that the means of transmission is not well understood. Contrary to ideas advanced in the popular scientific literature, Dr. Grigorenko noted that there is no evidence pointing to a language or grammar gene per se, but evidence does point to certain specific genes that are closely associated with language development. These genes appear to work together with environmental factors to determine language acquisition, and neuroimaging has linked them to specific properties of neural activation.

Don Compton, Professor of Psychology at the Florida State University Center for Reading Research, gave an entertaining, but critical, presentation of the 'Dyslexia as a superpower' movement, describing how the relationship between dyslexia and exceptionality can be evaluated scientifically at the population level (and even pointed the group to an online app for doing so!) As for individual level instruction, Dr. Compton went on to present a range of resources that all educators can access, including information from the Florida Center for Reading Research on 'Structured Literacy'. He concluded his talk with quotes from Margie Gillis, Haskins Affiliate and President of Literacy How, who discussed the difference between an intervention approach, such as Orton-Gillingham, and a structured reading program. An important take-home message from this discussion is that the uniformity of reading programs makes their efficacy easier to assess, compared to a less structured approach, which cannot be studied carefully because of its flexibility.

Fumiko Hoeft, Professor of Psychological Sciences, Psychiatry and Neuroscience at the University of Connecticut and the University of California, San Francisco, gave additional details regarding the neural basis of reading, describing how the coordination between particular areas of the brain is disrupted in dyslexic readers and how those with good comprehension despite poor decoding skill appear to have more grey matter in neural regions that control goal-directed behavior. Dr. Hoeft also reported as-yet-unpublished data showing that parent reading history predicts their child's cortical surface area, as well as their child's early reading performance.

Devin Kearns, Professor of Special Education at the University of Connecticut and Research Scientist at both Haskins and the Neag School's Center for Behavioral Education & Research (CBER), presented an interactive talk outlining six different causes of reading difficulty. Particularly compelling were his summary of evidence showing that reading difficulty is not a visual processing problem and his demonstration of how children with a poorly tuned phonological system will have difficulty distinguishing similar, but different, sounds.

Vincent Gracco, Vice President of Scientific Operations at Haskins and Professor of Speech, Language and Communication Disorders at McGill University, rounded out the presentations with an exciting discussion entitled "The Future of Neuroscience in the Classroom." Dr. Gracco enticed the group by summarizing recent research implementing EEG recording on a class-wide scale, which has been used to monitor classroom engagement and social dynamics. He further described how transcranial current stimulation are being used to correct imbalances between excitatory and inhibitory neurons in certain clinical populations (i.e., Parkinsons, Schizophrenia). His own recent work using these techniques to stimulate the entire speech network during speech motor learning suggests a future in which neural-based remediations could play a key role in stimulating underdeveloped reading networks.

To be added to the mailing list for information about future Summer Institutes, email communications@haskinslabs.org.

Shout Outs

HASKINS SCIENTISTS IN THE NEWS

Dr. David Lewkowicz joins Haskins' new Baby Lab

David Lewkowicz has recently accepted an appointment as a Senior Research Scientist at Haskins. He brings with him a recently funded NSF grant entitled "Development of Selective Attention to Multisensory Information in Human Infants," which will examine the mechanisms that underlie developmental changes in infant selective attention. He joins Dr. Richard Aslin, former Professor of Brain and Cognitive Sciences at University of Rochester, and Dr. Katarzyna Chawarska, Director of the Yale Social and Affective Neurodevelopment of Autism (SANA) Program, in conducting infant research at Haskins Baby Lab using state-of-the-art near infra-red spectroscopy (fNIRS) to examine brain activity, and dynamic eye-tracking and touchscreen interactions to monitor attention-driven gaze direction.

Drs. Nicole Landi and Dave Braze participate in Literacy Panel

The Literacy Coalition of Greater New Haven, in collaboration with the New Haven Free Public Library, hosted a forum on "*Reading Instruction and Interventions in School: Science, Policy, and Practice.*" Dave Braze, Coalition Board Member, moderated the panel, which also included Nicole Landi, Haskins Senior Scientst and UConn Associate Professor; Joanne R. White, Language Arts Consultant in the Academic Office at the Connecticut State Department of Education; and Waltrina Kirkland-Mullins, a classroom teacher at Davis Academy in New Haven. The October panel coincided with Dyslexia Awareness Month.

Dr. Philip Rubin appointed President-elect of FABBS

Philip Rubin, Chief Executive Officer and Senior Scientist emeritus, and current member of Haskins' Board of Directors, will serve as President-elect of the Federation of Associations in Behavioral & Brain Sciences (FABBS). FABBS is a coalition of scientific societies and related organizations that share an interest in advancing the sciences of mind, brain, and behavior for the betterment of society. FABBS helps to improve human well-being by promoting scientific research and training; educating the public about the contributions of research to individuals and society; fostering communication among scientists; and recognizing scientists who have made significant contributions to building knowledge.

Articulatory Phonology Workshop celebrates the life of Cathe Browman

A workshop was held in Pacific Grove, CA on July 11-14, bringing together 25 phonologists, phoneticians and other researchers who contributed to the theory of Articulatory Phonology (AP) over the last 35 years. The theory was initially developed at Haskins by Cathe Browman and Louis Goldstein, and is unique in incorporating articulatory gestures as the control units for both speech movement and distinguishing lexical items. This embodied approach provides a novel bridge between phonetics and phonology and enables concrete hypotheses about how to address articulatory disabilities through new patterns of articulatory coordination. The workshop celebrated the tremendous theoretical and clinical impact of AP, which grew out of Cathe's passion for finding new ways to look at the old problems of speech science. Sponsored by the National Science Foundation and the Cathe Browman Fund for Exploration, the workshop was organizaed by Senior Scientists Doug Whalen, Louis Goldstein, and Adamantios Gafos.

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85 years of Excellence in Speech and Language Research

Haskins Laboratories is a private, not-for-profit research institute founded in 1935, with a scientific mission to conduct cutting-edge research into the biological basis of speech, language, and reading, and their related disabilities. Together with long-standing collaborators from University of Connecticut, Yale University, and over 40 international partners, Haskins has pioneered the scientific theories that guide current clinical and educational remediations for speech and reading disabilities, including the motor theory of speech perception, the orthographic depth hypothesis, the phonological basis of dyslexia, and the neurobiological system that supports reading. The over-arching vision of the Laboratories is to leverage scientific innovation to enable those with language impairments to participate more fully in society.

Support our Mission

Haskins has been independently funded via governmental and foundation grants and contributions from individual donors for over 80 years. The generosity of our private donor base, made of up individuals who care passionately about evidence-based remediation, provides crucial support for the collection of pilot data and other outreach activities not fundable by government agencies. We encourage you to support our mission through your tax deductible contributions. For more information, visit haskinslabs.org/giving-haskins or contact Joseph Cardone, VP of Finance and Administration at cardone@haskinslabs.org.

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