ARiEALANNUAL REPORT**2022**

MESSAGE FROM THE DIRECTOR

**DR. IVONA KUČEROVÁ
ARIEAL DIRECTOR**

The year 2022 has been transformational in the Centre's efforts to define our research priorities and short- and long-term research goals. We have formulated our very first Vision, Values and Mission statements that will guide our research endeavors going forward. This collective exercise has clarified and confirmed the centrality of ARiEAL's full-cycle reciprocal approach to language sciences as the guiding principle of the Centre. These statements have also become pivotal in formulating our very first Strategic Research Plan that is going to steer the Centre's research activities for the next five years (2023-2028). In addition, our Plan has guided the process of forming our new Scientific Advisory Committee (expected to be announced in Fall 2023), shaped around research excellence intertwined with the values of equality, diversity, and inclusion. These achievements have benefited from the extensive feedback provided by an External Review Board committee that highlighted our successes and provided useful recommendations to further refine our training and research practices and provided guidance for a more financially sustainable future.

Despite the restrictions to research that we faced over the course of the COVID-19 pandemic, ARiEAL researchers secured ten new grants totaling more than $1.6 million dollars. Our researchers also gave close to 50 presentations, published 44 journal articles, 2 book chapters, 1 technical paper, and 4 proceedings papers, some of them co-authored and co-presented with our trainees. These achievements reaffirm the quality of the training they receive in our labs and the importance of their intellectual contribution.

Hand in hand with our pursuit of research excellence, the year 2022 also highlighted our commitment and our capacity to support local communities, underserved research communities and forcibly displaced scholars, in a meaningful and ethically responsible way. ARiEAL has become home to four forcibly displaced scholars from Ukraine, each fully integrating themselves in our research community: two graduate students (Olga Dvorova and Mariia Hryntus) and two postdoctoral fellows (Drs. Maiia Bulakh and Alina Dochu). Their tenures at ARiEAL have been generously supported by SSHRC, McMaster's Scholars at Risk Program, and the US-based Scholars at Risk Network – Ukraine Fellowship.

Our success at bringing in and integrating our Ukrainian scholars would have not been possible without the enormous efforts, ingenuity, and commitment of Chia-Yu Lin, the Centre's former manager, who was an instrumental figure at ARiEAL and its larger community since its inception. In July 2022, Ms. Lin was appointed to a managerial position at the Public Health Agency of Canada – an incredible opportunity and a well-deserved recognition of her exquisite knowledge translation skills and passion for equity, diversity, and inclusion. Over the years, Chia-Yu has become a mentor to many of our trainees and a tremendous colleague and a friend to all of us. We remain grateful for her contributions that extend well beyond the Ukrainian initiative.

The year of 2022 also saw us working towards our new International Visiting Scholar Program. We will welcome our program's first visitors from Nigeria, Ghana, Brazil, Bangladesh, and Spain in the academic year 2023-24. Moreover, we have continued to engage with pre-existing local community partners and created new community partnerships. To mention a few, Dr. Kuperman's Reading Lab has continued their highly innovative and socially impactful work with older adults; Dr. Moro's framework for the MELD has been instrumental in creating McMaster's new diploma in Indigenous language revitalization which recognizes community-based Indigenous language reclamation efforts; and Dr. Turkstra's lab embarked on a new line of research helping Canadian veterans suffering from post-traumatic stress syndrome.

As in previous years, our trainees have been central to our pursuits. They critically contribute to the research done in ARiEAL's labs, and their energy and organizational efforts brought back several in-person events. A special thanks goes to the ARiEAL Operational Team, under the guidance of the Centre's new research program manager, Dr. Maxime Dagenais (as of September 2022). It was instrumental in creating additional learning opportunities and social events for our trainees and other community members in our first academic year fully back in person since 2019.

As I write this message, I cannot but be grateful for the tremendous efforts that my colleagues and the Centre's trainees have made to fully return to in-person research activities and to rebuild our research community heavily impacted by the 2+ years of the pandemic. ARiEAL is yet again a bustling research community, fully committed to advancing our research excellence and doing so in an ethically responsible manner. I am confident that this year, the Centre will continue to growth and create impactful research, affirming our ambition to be a global leader in the full-cycle approach to language sciences.

Wishing you all a peaceful, healthy, and productive year.

Ivona Kučerová

RESEARCH HIGHLIGHTS

ARiEAL is a research centre that brings together a collaborative and interdisciplinary community of researchers ranging from undergraduate trainees to established scholars and enables them to excel in their problem-driven language science research in fundamental, experimental, and applied linguistics. Our work is grounded in principles of equity, diversity, and inclusion, and we believe in rigorous and integral scientific inquiry and the complementarity of fundamental and applied research. Highlighted in this report are the research, knowledge mobilization, and training activities for each of our laboratories for the year 2022.

READING LAB

The Reading Lab, directed by Dr. Victor Kuperman, targets a range of areas in psycholinguistics and corpus linguistics with research foci such as the cognitive and socio-demographic predictors of literacy and reading comprehension in adults across languages. The Reading Lab's research paradigms include eye-tracking, behavioural studies, large-scale norming studies, and quantitative analyses of written and spoken corpora.

In 2022, Dr. Kuperman published several articles in high impact journals, including *Behavior Research Methods, Journal of Experimental Psychology: Human Performance and Perception, Frontiers in Political Science,* and *Experimental Aging Research.* Dr. Kuperman was also the recipient of a Future of Canada Project research grant (supported by Chancellor Emeritus L.R. Wilson) for a project titled "Bringing hope and well-being to community-dwelling older Ontarians in the pandemic world through creative writing and digital literacy learning." With this research, Dr. Kuperman and his interdisciplinary team of McMaster researchers from the Faculties of Business, Social Sciences, Sciences, and Health Sciences seek to develop tools and practices that will allow older adults that suffer from social isolation to form social connections during periods of physical isolation (such as the recent Covid-19 Pandemic). These tools can help ensure their proper health and well-being. Dr Kuperman also received the International Initiatives Micro-Fund to support the project entitled "The language of trauma in testimonies of the Russia-Ukraine war" conducted in collaboration with partners in Ukraine.

In 2022, two PhD students (Gaisha Oralova co-supervised with John Connolly and Melda Coskun Karadag) and two MSc students (Megan Karabin and Kaitlyn Battershill) graduated from the Reading Lab.

DR. VICTOR KUPERMAN

MELD RESEARCH LAB

DR. ANNA MORO

The McMaster English Language Development (MELD) Programs and the MELD Bilingualism Lab are directed by Dr. Anna Moro, the Associate Director of ARiEAL. The MELD programs are intended for international students whose primary language is not English but who wish to improve their English proficiency to succeed in an English-speaking higher education environment. Since 2018, the MELD Programs have expanded their services from the MELD Diploma to also include McMaster English Readiness for Graduate Excellence (MERGE) and McMaster Office for the Development of English Language Learners (MODEL) to offer an even more comprehensive range of services to international students of all levels. Both MELD and MODEL incorporate problem-based learning and reflective practice in their curriculum and were offered virtually during the pandemic. A new pathway program, STEP (Summer Transition through English Prep) – a short-term program for students who almost meet language proficiency requirements for direct entry – developed in 2022, will launch in the summer of 2023.

The MELD Bilingualism Lab investigates the underlying linguistic mechanisms of bilingual phenomena and focuses on second language development. In 2022, along with research associate Dr. Daniel Schmidtke, Dr. Moro published two articles based on this research. The first appeared in *Applied Psycholinguistics* titled "Morphological knowledge in English learner university students is sensitive to language statistics: A longitudinal study" and the second in *Bilingualism: Language and Cognition* titled "Tracking reading development in an English language university-level bridging program: evidence from eye-movements during passage reading." Drs. Moro and Schmidtke also won a Social Sciences and Humanities Research Council (SSHRC) Insight Development Grant for a project titled "Beyond bridging: linguistic indicators of academic and literacy outcomes of international students in a Canadian university" (PI Dr. Schmidtke).

NEUROTECHNOLOGY & NEUROPLASTICITY LAB

Dr. Sue Becker is the director of the Neurotechnology & Neuroplasticity Lab, which uses computational modeling and empirical studies to investigate the neural bases of learning and memory and how it serves in episodic future thinking, planning, and decision-making. Dr. Becker's lab addresses research questions such as how the hippocampus codes episodic and spatial memories, and how stress, exercise, and neurofeedback affect hippocampal memory functions and intrinsic brain networks. This research can be applied to brain-computer-interfaces, sensory substitution for prosthetic limbs, and furthering our understanding of memory related disorders such as post-traumatic stress disorder.

In 2022, Dr. Becker's brilliant career as a researcher, professor, and member of the McMaster community was rewarded with a McMaster University Faculty Association Award for Outstanding Service. Her student, Hubert Banville, also received their doctorate this year. Congratulations Hubert! Dr. Becker and her team published several articles in high impact journals including *Brain and Cognition, Frontiers in Behavioural Neuroscience,* and *Translational Psychiatry*, and Dr. Becker was invited to contribute a chapter – titled "Memory for Space" – in *The Oxford Handbook of Human Memory*, published by the prestigious Oxford University Press.

DR. SUE BECKER

LANGUAGE, MEMORY & BRAIN LAB

The Language, Memory and Brain (LMB) Lab is co-directed by Drs. John Connolly and Elisabet Service. Dr. Service investigates the cognitive building blocks in language development and its relationship with working memory. Her basic research is on first and second language acquisition, spoken word processing, and other related cognitive processes. Much of this work is then applied in investigations of language disorders including dyslexia. Dr. Connolly's work uses EEG methods to study brain health and language functions.

In 2022, Dr. Service produced a book chapter for *The Cambridge Handbook of Working Memory and Language* titled "How measures of working memory relate to L2 vocabulary", published by Cambridge University Press. Dr. Service also published an article with ARiEAL researcher Dr. Daniel Pape titled "Short-term memory for auditory temporal patterns and meaningless sentences predicts learning of foreign word forms" in *Brain Sciences* and another with Dr. Pape and former ARiEAL trainee Dr. Fareeha Rana for *Interspeech*. Dr. Service also won a Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant for a project investigating the impact of temporal patterns on short-term memory for speech and on language learning. Finally, Fareeha Shahid Rana (supervised by Drs. Service and Connolly), Gaisha Oralova (supervised by Drs. Connolly and Kuperman), and Adianes Herrera-Diaz (supervised by Dr. Connolly) defended their doctoral dissertations in 2022. Netri Pajankar (supervised by Dr. Connolly) also completed their master's. Congratulations everyone!

DR. ELISABET SERVICE
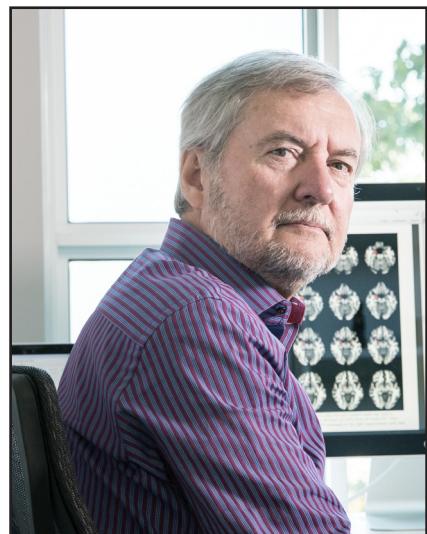
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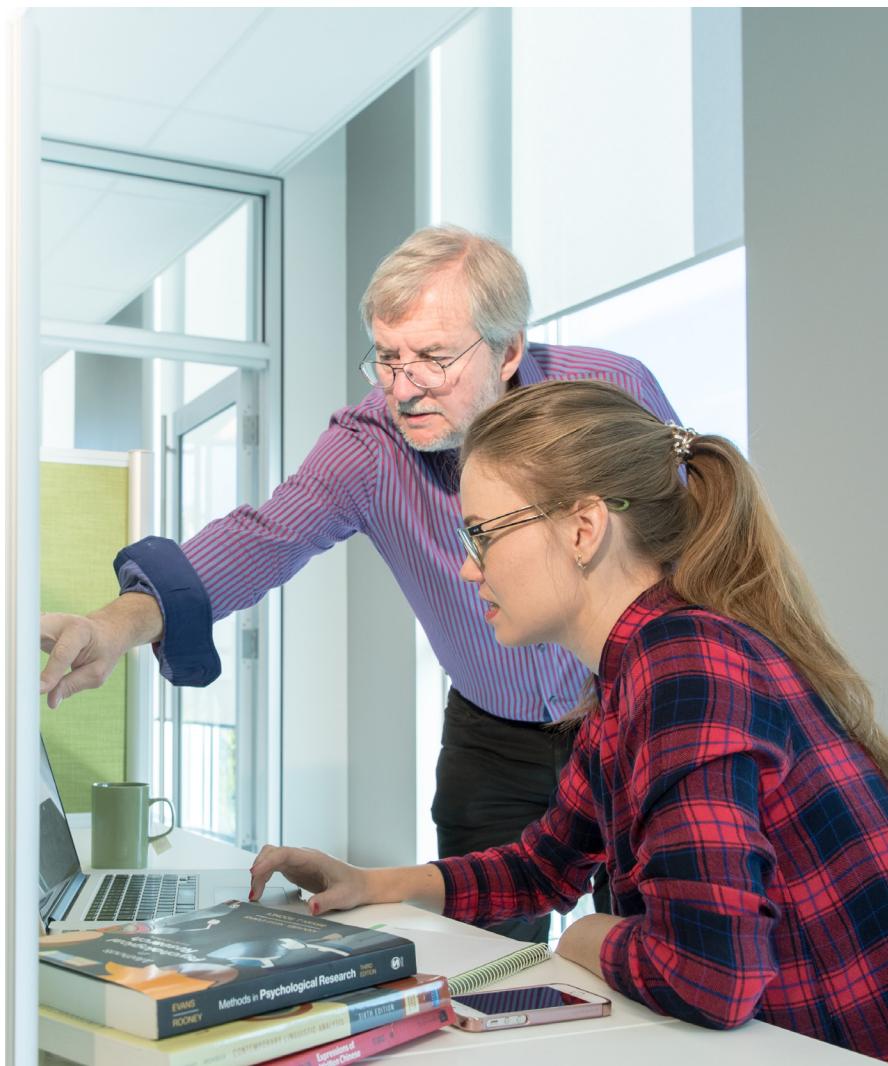
IMAGING PHYSICS & ENGINEERING, IMAGING RESEARCH CENTER

DR. MICHAEL NOSEWORTHY

Dr. Michael Noseworthy is a professor in Electrical and Computer Engineering and also the Associate Chair (Research) of Radiology. In addition, he is the director of Medical Imaging Physics and Engineering at the Imaging Research Centre at St. Joseph's Healthcare, Hamilton. Dr. Noseworthy's research interests focus on assessment of tissue microstructure and metabolism using multimodal medical imaging, such as the magnetic resonance imaging (MRI) and in vivo nuclear magnetic resonance (NMR) spectroscopy. His work considerably involves developing imaging hardware and software, and his research team studies physiological problems and diseases using advanced medical imaging techniques.

In 2022, Dr. Noseworthy and his team published over a dozen articles, including many in high impact journals, such as *European Journal of Sport Science, Brain Disorders,* and *Applied Physiology, Nutrition, and Metabolism.* Dr. Noseworthy also won a prestigious Canadian Institute of Health Research (CIHR) research grant for a project investigating "[t]he efficacy of soluble dietary fibre supplementation for the treatment of paediatric non-alcoholic fatty liver disease (NAFLD)." Several of Dr. Noseworthy's graduate students – Josh McGillivray, Thaejaesh Sooriyakumaran, and Neil MacPhee – received their master's, and Ethan Danielli and Paul Polak completed their doctoral studies in 2022. Congratulations to all!

PHONETICS LAB

Dr. Daniel Pape is the director of the Phonetics Lab. His research examines experimental phonetics and speech acoustics, the link between speech production and speech perception, and how individual and group differences (like accented speech and ASD) affect spoken speech communication. One current research stream examines production and perception differences of bilingual speakers with different degrees of proficiency in their two languages, more specifically Canadian English/French speakers. Other research in the lab examines how accented speech and the introduction of different noise sources influences speech perception and spoken speech comprehension.

In 2022, Dr. Pape won a postdoctoral research grant with SSHRC's Special Response Fund for Trainees (Ukraine), allowing Dr. Maiia Bulakh to join ARiEAL and the Phonetics Lab from Ukraine as a postdoctoral fellow. Together with fellow ARiEAL researcher Dr. Service and former ARiEAL trainee Dr. Fareeha Rana, Dr. Pape also published articles in *Brain Sciences* and *Interspeech*. Together with ARiEAL trainee Carla Weigel and researcher Magda Stroińska another journal paper was published in the *LACUS Forum*. Dr. Pape also presented a paper titled "The Effects of Different Voice Quality on the Perceived Personality of a Speaker" with his current doctoral trainee Sara Pearsell at the *International Conference on Laboratory Phonology*. Finally, Dr. Pape presented his research at various international conferences, including at *Interspeech 2022* in Incheon, South Korea and the *Annual Conference of Linguistic Associations of Canada and the United States (LACUS)* at Molloy College, New York, USA.

DR. DANIEL PAPE

GRAMMATICAL THEORY GROUP

DR. ALISON BIGGS

In 2022, we welcomed a new researcher and lab at ARiEAL: Dr. Alison Biggs and the Grammatical Theory Group. An assistant professor in the Department of Linguistics and Languages at McMaster University, Dr. Biggs' research focuses on the formal characterization of speaker knowledge of language. Her main area of investigation is syntax and its interfaces with morphology, semantics, and the lexicon. Her research also examines linguistic variation, both cross-linguistic (the possible and impossible ways in which languages and dialects can vary from each other) and inter-individual variability.

In 2022, Dr. Biggs published an article in *Linguistic Inquiry* titled "On the event-structural properties of the English get-passive." In this article, Dr. Biggs presents an analysis of get-passives centred on the proposal that they contain additional event structure (realized as get) relative to their be counterparts, an analysis that offers new insight into the role of event structure in the derivation of semantic and pragmatic aspects of argument interpretation. Dr. Biggs also won a Partnered in Teaching and Learning seed grant from the Office of the Provost and Vice-President (Academic) for building accessible and flexible learning tools for linguistic analysis, and she presented her cutting-edge research on comparison class and adjective classifiers at the *Canadian Linguistic Association*'s annual conference. Dr. Biggs also gave two invited seminars at the University of Massachusetts, Amherst and the University of Pennsylvania and began working on a new research project on argument structure (unaccusatives and passives) in Teochew languages.

SONNADARA LAB

DR. RANIL SONNADARA

Directed by Dr. Ranil Sonnadara, the Performance Science Lab aims to understand the science and art behind human performance. More specifically, the lab investigates how individuals learn complex skills, how information flow across the motor and perceptual systems changes with practice, and how feedback and assessment can be effectively implemented to support skill acquisition. Much of the lab's current work focuses on education of health professionals, musicians, and athletes.

In 2022, Dr. Sonnadara published an article in *Journal of Aging Studies* with ARiEAL researcher Dr. Kuperman. Titled "Personhood and aging: Exploring the written narratives of older adults as articulations of personhood in later life," Dr. Sonnadara and his team consider the experiences of aging more generally to better understand how non-cognitively impaired older adults construct personhood through narrative writing. Dr. Sonnadara was also a co-applicant on Dr. Kuperman's team that won a Future of Canada Project research grant (supported by Chancellor Emeritus L.R. Wilson) to develop tools and practices that will allow older adults that suffer from social isolation to form social connections during periods of physical isolation. These tools can help ensure their proper health and well-being.

SYNTAX LAB

Dr. Ivona Kučerová, director of the Syntax Lab and ARiEAL, investigates syntactic structures, with a specific focus on the syntax-semantics interface. More specifically, the lab is investigating if, and how semantic information can modulate syntactic derivation. Both traditional fieldwork and experimental methods are used to collect data from cross-linguistically diverse languages, including Indigenous languages of Canada. The goal of this research is to identify and model universal and language-specific structural properties of human languages. The primary focus of the work currently conducted in the Syntax Lab is on modelling features at the syntax-semantics interface.

In 2022, Dr. Kučerová and her team won a prestigious New Frontiers in Research Fund (NFRF) exploration grant for a project titled "Language revitalization in infants: Lullabies as a tool to promote intergenerational mobility, Indigenous health and community well-being." Dr. Kučerová also published an article with the *Canadian Journal of Linguistics* and presented her research at various international conferences and guest lectures, including at New York University, the University of Maryland, the *Fifth Montréal-Ottawa-Toronto- Morphology Meeting (MoMOT 5)* at l'Université du Québec à Montréal, and the *24th Indigenous Knowledge Symposium: Indigenous Language Revitalization* at Queen's University (Kingston, ON). Dr. Kučerová also welcomed Dr. Alina Dochu — a postdoctoral fellow from Ukraine — to her lab. Dr. Dochu's research centers on the revitalization of Crimean Tatar, an endangered and indigenous language to Ukraine, specifically in the domain of language policies. Finally, Kurtis Commanda also completed their master's degree in 2022, under Dr. Kučerová's supervision. Congratulations Kurtis!

DR. IVONA KUČEROVÁ

TURKSTRA LAB

Dr. Lyn Turkstra is the director of the Turkstra Lab, which focuses on the links between cognitive function and social communication in individuals with traumatic brain injury (TBI). The Lab conducts both experimental and translational research on communication in adolescents and adults and collaborates on development of practice standards to translate research findings into improved clinical practice and long-term patient outcomes.

In the past year, Dr. Turkstra and her research team have received two major research grants; the first from the Canadian Institutes of Health Research (CIHR) to investigate symptom-targeted rehabilitation for cognitive complaints after COVID (STAR-C3) and the second from Atlas Institute for Veterans and Families to investigate symptom-targeted cognitive rehabilitation for Canadian veterans with TBI and post-traumatic stress syndrome. Dr. Turkstra and her team also published their research in several high impact journals,

such as *Canadian Journal of Speech-Language Pathology and Audiology, Quality of Life Research, International Journal of Language & Communication Disorders, Neuropsychological Rehabilitation, Journal of Head Trauma Rehabilitation*, and *American Journal of Speech-Language Pathology*. Dr. Turkstra also presented research at several international conferences, including at the *American Congress of Rehabilitation Medicine, North American Society of Head Injury Associations, Neuropsychology Association of North America*, and the *Centre of Excellence for Canadian Veterans with Chronic Pain*. Two of Dr. Turkstra's undergraduate students – Imad Ali and Adam Clarke – also completed their honour's theses this year. While Imad Ali investigated the influence of Emojis on text message interpretation in adults with and without TBI, Adam Clarke considered resilience and outcomes from cognitive rehabilitation in service members and veterans with mild TBI.

DR. LYN TURKSTRA
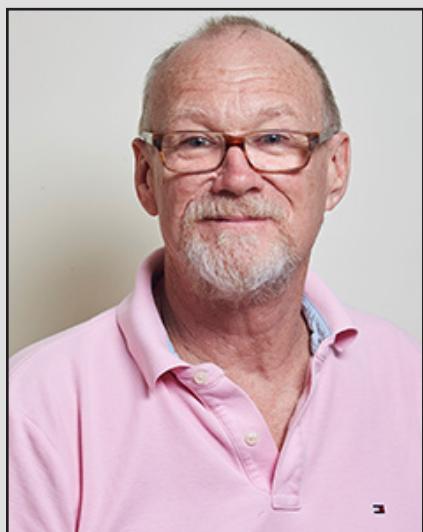
DR. JIM REILLY

THE REILLY LAB

Dr. Jim Reilly is an internationally renowned researcher in the field of signal processing. His work focuses on the application of machine learning and signal processing to problems in neuroscience and psychiatry. His work has been applied to improving diagnosis and treatment of psychiatric illness, prognosis for coma outcome, and assessment of infant motor movement relating to neurological deficit.

In 2022, Dr. Reilly and his collaborators published research resulting from their machine learning approach in identifying

self-harm and suicidal ideation among military and police veterans in the *Journal of Military, Veteran and Family Health*. They also published research on longitudinal changes in sleep in *The Journal of Clinical Psychiatry* and on predictive error responses to unexpected sound omission in adults in the *European Journal of Neuroscience*. Jane Klavir, an undergraduate student that Dr. Reilly co-supervised, also completed their research project on the detection of apnea using cell phone accelerometer data. Congratulations!

BY THE NUMBERS

Knowledge mobilization remains a central tenant of the mission, values, vision, and strategic planning at ARiEAL. We not only strive to produce interdisciplinary, collaborative, and ethical research, but we also strive to produce research that impacts academic knowledge and has societal benefits. In 2022, our researchers have been very active disseminating their ground-breaking research by publishing articles and book chapters and presenting at academic conferences and as guest lecturers. Our researchers have also secured prestigious research grants, awards, and funding for future research projects and collaborations.

PUBLICATIONS

In 2022, ARiEAL researchers have published over **50 texts**, including 44 journal articles, 2 books chapters, 1 technical report, and 4 in conference proceedings. These publications highlight the breath of the research being done at ARiEAL. Broadly speaking, publication topics include bilingualism and second language development, personal experiences, social media, and the Russia-Ukraine War, traumatic brain injury, speech language pathology, and memory. These publications speak to the tremendous impact that our researchers had in their respected fields as they have all published in several high impact publications.

JOURNAL ARTICLES

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Biggs, A. & Embick, D. (2022). On the event-structural properties of the English get-passive. Linguistic Inquiry, 53(2), 211−254.

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Jaggers, K., Gillett, J., **Kuperman, V.**, Kyröläinen, A.-J. & **Sonnadara, R.** (2022). Personhood and aging: Exploring the written narratives of older adults as articulations of personhood in later life. Journal of Aging Studies, 62, 1-9.

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Kakonge, L., Charron, V.P., Vedder, J., Wormald, K. & **Turkstra, L. S.** (2022). A mapping review of adolescent identity after TBI: what clinicians need to know. Neuropsychological Rehabilitation, 32(8), 1868-1903.

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JOURNAL ARTICLES (CONT)

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Manoranjan, B., Scott, T., Szasz, O. P., Bzovsky, S., O'Malley, L., Sprague, S., [...] & **Turkstra, L. S.** (2022). Prevalence and perception of intimate partner violence-related traumatic brain injury. Journal of Head Trauma Rehabilitation, 37(1), 53-61.

McCarron, S. P. & **Kuperman, V.** (2022). Effects of year of post-secondary study on reading skills for L1 and L2 speakers of English. Journal of Research in Reading, 45(1), 43-64.

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Shaw, S.B., Levy, Y., Mizzi, A., McKinnon, M.C., Heisz, J. & **Becker, S.** (2022). Combined aerobic exercise and neurofeedback lead to improved task-relevant intrinsic network synchrony. Frontiers in Behavioural Neuroscience, 16, 1-13.

Siegelman, N., Schroeder, S., [...] & **Kuperman, V.** (2022). Expanding horizons of cross-linguistic research on reading: The multilingual eye-movement corpus (MECO). Behavior Research Methods, 54, 2843-2863.

Slyepchenko, A., Minuzzi, L., **Reilly, J.** & Frey, B.N. (2022). Longitudinal changes in sleep, biological rhythms and light exposure from pregnancy to postpartum and their impact on perinatal mood and anxiety. The Journal of Clinical Psychiatry, 83(2), 1-11.

Tajik, M. & **Noseworthy, M.D.** (2022) A review of molecular and genetic factors for determining mild traumatic brain injury severity and recovery. Brain Disorders, 8, 1-10.

Watts, D., Librenza-Garcia, D., Ballester, P., Passos, I., Kessler, F., Gea, L., **Reilly, J.**, Kapczinski, F. & Chaimowitz, G. (2022). Predicting criminal and violent outcomes in psychiatry: a meta-analysis of diagnostic accuracy. Translational Psychiatry, 12(470), 1-11.

Watts, D., Pulice, R.F., **Reilly, J.** et al. (2022) Predicting treatment response using EEG in major depressive disorder: A machine-learning meta-analysis. Translational Psychiatry, 12(332), 1-18.

Wild, H.A., Kyröläinen, A.-J. & **Kuperman, V.** (2022). How representative are student convenience samples? A study of literacy and numeracy skills in 32 countries. PLOS One, 17(7), 1-22.

Whyte, J., Van Stan, J., & **Turkstra, L. S.** (2022). For the rehabilitation treatment specification networking group of the American Congress of Rehabilitation Medicine. Specifying aphasia therapies. Letters to the Editor. Archives of Physical Medicine and Rehabilitation, 103(6), 1242-1244.

Zasiekin, S., **Kuperman, V.**, Hlova, I. & Zasiekina, L. (2022). War stories in social media: Personal experience of Russia-Ukraine war. East European Journal of Psycholinguistics, 9(2), 160-170.

CONFERENCE PROCEEDINGS

Cahill, P. T., Ng, S., Dix, L., Ferro, M. A., **Turkstra, L. S.** & Campbell, W. N. (2022). Determining impact following service delivery model transition: Contemporary outcomes practices for school-based speech-language therapy services. 29th Annual Conference of the International Society for Quality of Life. Research Quality of Life Research, 31(Suppl 2), 79.

Eranovic, J., **Pape D.**, Stroińska, M., **Service E.** & Matkovski, M. (2022). Effects of noise on speech perception and spoken word comprehension. Proceedings of the International Speech Communication Association Interspeech, Incheon, Korea, 3103-3107.

Rana F., **Pape, D.** & **Service E.** (2022). The effect of increasing acoustic and linguistic complexity on auditory processing: an EEG study. Proceedings of the International Speech Communication Association Interspeech, Incheon, Korea, 4048-4052.

Becker, S., Dhindsa, K., Mousapour, L. & Al Dabagh, Y. (2022). BCI illiteracy: Its us, not them. optimizing BCIs for individual brains. Proceedings of the 10th International Winter Conference on Brain-Computer Interface, Gangwon-do, South Korea, 1-3.

BOOK CHAPTERS

Becker, S. (2022). Memory for space. In M.J. Kahana & A.D. Wagner (Eds), The Oxford Handbook of Human Memory. Oxford, UK: Oxford University Press.

Service, E. & Simard, D. (2022). How measures of working memory relate to L2 vocabulary. In Wen, Z. & Schwieter, J. (Eds.), The Cambridge Handbook of Working Memory and Language (Cambridge Handbooks in Language and Linguistics, pp. 529-549.) Cambridge, UK: Cambridge University Press.

TECHNICAL REPORTS

Wild, H.A. & **Kuperman, V.** (2022). Technical report on using in-house English-speaking assessments to place Mohawk College students in communication classes. McMaster University.

PRESENTATIONS

Researchers have presented over 50 academic papers, posters, and invited talks over the course of 2022. Our researchers have presented their cutting-edge research in numerous high profile international conference and academic institutions, which speaks to the global impact that our researchers and laboratories have on their respected fields.

51 PUBLICATIONS

44 Journal Articles

2 Book Chapters

1 Technical Report

4 Conference Proceedings

50+ PRESENTATIONS

Becker, S. (2022, February). BCI Illiteracy: It's us, not them. Optimizing BCIs for individual brains. BCI2022: 10th IEEE International Winter Conference on Brain-Computer Interfaces. High1 Resort, Gangwon, South Korea.

Biggs, A. (2022, June) Formal approaches to slavic linguistics. 31st Formal Approaches to Slavic Linguistics (FASL 31) Conference. McMaster University, Hamilton, Canada.

Danielli, E., Simard, N., Doughty, M. & **Noseworthy, M.D.** (2022, March). Quantifying lasting regional microstructural and functional abnormalities in aging retired professional football players. Imaging Network of Canada ImNO-2022. London, Canada (Poster).

Danielli, E., Padrela, B., Doughty, M., Petr, J., Mutsaerts, H.-J. & **Noseworthy, M.D.** (2022, May). Novel arterial spin labelling (ASL) brain injury symmetry assessment in retired professional athletes: a preliminary study. International Society for Magnetic Resonance in Medicine (ISMRM). London, United Kingdom. (Poster).

Danielli, E., Padrela, B., Doughty, M., Petr, J., Mutsaerts, H.-J. & **Noseworthy, M.D.** (2022, February). Personalized regional and symmetry assessment of normalized spatial coefficient of variance (sCoV), based on cerebral blood flow, in retired Canadian Football League players. Traumatic Brain Injury Conference. Toronto, Canada.

Danielli, E., Ulmer, S., Simard, N. & **Noseworthy, M.D.** (2022, September). Brain injury burden based on MRI assessment of regional cerebral blood flow (rCBF) in former professional football players. 5th Swiss Federation of Clinical Neuro-Societies Congress. Basel, Switzerland.

Eranovic, J., **Pape, D.**, Stroínska, M., **Service, E.** & Matkovski, M. (2022, September). Effects of noise on speech perception and spoken word comprehension. 23rd Interspeech Conference. Incheon, Korea.

PRESENTATIONS (CONT)

Ho, R.A., Shaw, S.B., Bock, N.A., DeMatteo, C., **Noseworthy, M.D.** & Hall, G.B. (2022, May) Dynamic resting state connectivity of the default mode, salience and central executive networks in adolescents with concussion. International Society for Magnetic Resonance in Medicine (ISMRM). London, United Kingdom. (Poster Presentation)

Kučerová, I. (2022, October). Agreement asymmetries arise from the order of Merge and Agree (joint work with Alan Munn). New York University, New York City, United States.

Kučerová, I. & Munn, A. (2022, November). Agreement is morphology but there is no morphology without syntax. MoMOT (Morphology at Montreal, Ottawa and Toronto). Université du Québec à Montréal, Montréal, Canada.

Kučerová, I. & Munn, A. (2022, May) What has labelling ever done for us? MayFest. University of Maryland, College Park, United States.

Kuperman, V. (2022, August). A cross-linguistic study of spatial parameters of eye-movement control during reading. Presentation at the European Conference for Eye Movements. Leicester, United Kingdom.

Kuperman, V. (2022, August). The impact of story-telling in isolation on older adults. International Federation of Aging Global Cafe. Toronto, Canada.

Kuperman, V. (2022, July). Linguistic distance affects literacy and health of immigrants in Canada. Presentation at the Scientific Studies of Reading. Newport Beach, United States.

McGillivray, J., Kumbhare, D.A. & **Noseworthy, M.D.** (2022, May). Differentiating skeletal muscle fiber composition using a bi-Fractal model of resting-state muscle BOLD. International Society for Magnetic Resonance in Medicine (ISMRM). London, United Kingdom. (Poster)

McGillivray, J., Kumbhare, D.A. & **Noseworthy, M.D.** (2022, May) Estimating muscle fiber composition via Resting-state muscle BOLD signal complexity. Imaging Network of Canada ImNO-2022. London, Canada.

Moro, A. & Schmidtke, D. (2022, November) Phonological similarity judgements among moderately proficient adult English language learners. 63rd annual meeting of the Psychonomic Society. Boston, United States.

Moro, A. & D. Schmidtke. (2022, March). Tracking reading development in a second language: perspectives from a university bridging program. Presentation (virtual) to ARiEAL research center community. Hamilton, Canada.

Nowikow, C.E., Polak, P. & **Noseworthy, M.D.** (2022, May). Variability in brain sodium total sodium content (TSC) mapping quantification methods. International Society for Magnetic Resonance in Medicine (ISMRM). London, United Kingdom. (Poster)

Pape, D. (2022, April). Voicing perception of intervocalic velar plosives examined in a biomechanical modelling study: Results from (Canadian) English and cross-linguistic comparisons. University of Toronto, Department of Linguistics, Toronto, Canada. (Invited talk)

Pearsell, S. & **Pape, D.** (2022, June). The effects of different voice quality on the perceived personality of a speaker. Proceedings of the International Conference on Laboratory Phonology (Labphon18). Hanyang University, Seoul, South Korea.

Owusu, B. & **Service, E.** (2022, November). Can rhythmic stimulation benefit verbal memory? NeuroMusic 18th Annual Conference, McMaster University, Ontario, Hamilton.

Radadia, N., Jamal, M., Begum, H., Huang, C., Radford, K., Lavigne, N., Farncombe, T., Konyer, N.B., Marriott, C., **Noseworthy, M.D.**, Priel, E., Nair, P., Shargall, Y. & Svenningsen, S. (2022, May) Prevalence and clinical relevance of ventilation heterogeneity and luminal cellular inflammation in lung cancer patients prior to lung resection: An interim Analysis. American Thoracic Society (ATS). Sans Francisco, United States. (Poster)

Rana, F., **Pape, D.** & **Service, E.** (2022, September). Effects of noise on speech perception and spoken word comprehension. 23rd Interspeech Conference. Incheon, Korea.

Rana, F. S., **Pape, D.** & **Service, E.** (2022, September). The effect of increasing acoustic and linguistic complexity on auditory processing: an EEG study. Interspeech 2022. Incheon, Korea.

Rana, F.S., **Pape, D.** & **Service, E.** (2022, March). The effect of increasing acoustic and linguistic complexity on auditory processing: an EEG study. 2022 Montreal-Ottawa-Toronto Phonology/Phonetics Workshop (MOT). Carleton University, Ottawa, Canada.

Schmidtke, D., Rahmanian, S. & **Moro, A.** (2022, July). Tracking reading development in an English language bridging program: evidence from eye-movements during passage reading. Society for the Scientific Study of Reading (SSSR) Annual Meeting 2022. Newport Beach, United States.

Sharma, B., Dematteo, C., **Noseworthy, M.D.** & Timmons BW. (2022, March). Resting-state brain activity in pediatric concussion: A sex-based analysis. Imaging Network of Ontario ImNO-2022. London, Canada. (Poster).

Sharma, B., Dematteo, C., **Noseworthy, M.D.** & Timmons BW. (2022, May) Sex-differences in resting-state brain activity in children with concussion in comparison to matched healthy controls. International Society for Magnetic Resonance in Medicine (ISMRM). London, United Kingdom.

Simard, N., Kumbhare, D.A., Ulmer, S. & **Noseworthy, M.D.** (2022, July). Using complexity analysis of resting state functional magnetic resonance imaging (rs-fMRI), and machine learning to detect functional damage in patients with concussion. International Neurotrauma Symposium. Berlin, Germany. (Poster)

Simard, N., Kumbhare, D.A., Ulmer, S. & **Noseworthy, M.D.** (2022, July). Using magnetic resonance imaging (MRI) and big data machine learning to detect structural damage in patients with concussion. International Neurotrauma Symposium. Berlin, Germany. (Lightning Talk & Poster)

Simard, N., Kumbhare, D.A., Ulmer, S. & **Noseworthy, M.D.** (2022, September). Using magnetic resonance imaging (MRI) and big data machine learning to detect structural damage in patients with concussion. Swiss Federation of Clinical Neuro-Societies Congress. Basel, Switzerland. (Poster)

PRESENTATIONS (CONT)

Simard, N., **Noseworthy, M.D.** & Danielli E. (2022, February). Using magnetic resonance imaging (MRI) to detect structural and functional damage in the cerebellum of patients with a history of mild traumatic brain injury (mTBI). Traumatic Brain Injury Conference. Toronto, Canada. (Poster)

Simard, N. & **Noseworthy, M.D.** (2022, May). Age and sex contributions to variance in resting state fMRI (rs-fMRI) temporal complexity analysis. International Society for Magnetic Resonance in Medicine (ISMRM). London, United Kingdom. (Poster)

Sooriyakumaran, T. & **Noseworthy, M.D.** (2022, May). Investigation of graph signal processing applications to muscle BOLD. International Society for Magnetic Resonance in Medicine (ISMRM). London, United Kingdom. (Poster)

Tajik, M., Danielli, E., Fahnestock, M. & **Noseworthy, M.D.** (2022, February). Bioinformatic analysis of genetic changes following mild traumatic brain injury). Traumatic Brain Injury Conference. Toronto, Canada. (Poster)

Turkstra, L.S. (2022, January). Cognitive rehabilitation update. Speech and Hearing Association of Alabama Annual Conference. Birmingham, United States.

Turkstra, L.S. (2022, January). Co-morbid pain and cognitive impairments in patients with traumatic brain injury: Challenges and recommendations. Centre of Excellence for Canadian Veterans with Chronic Pain. Hamilton, Canada.

Turkstra, L.S. (2022, September). Current best practices in cognitive rehabilitation: What, when, and for whom? University of Alabama at Birmingham. Rehabilitation Rounds. Birmingham, United States.

Turkstra, L.S. (2022, October). Executive functions: Last in, first out, and most easily damaged. Center for Brain Injury Research and Training. Eugene, United States.

Turkstra, L.S. (2022, March). Principles of universal access and design within juvenile justice partnerships. North American Society of Head Injury Associations. New York City, United States.
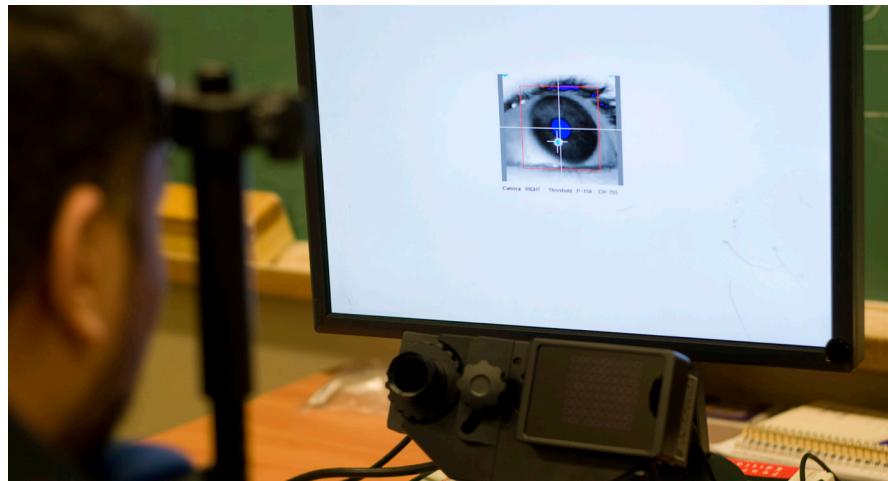
Turkstra, L.S. (2022, November). Rehabilitation Treatment Specification System (RTSS) and clinical reasoning: Educational resources for academic and clinical Settings. American Congress of Rehabilitation Medicine. Chicago, United States.

Turkstra, L.S. (2022, July). Rehabilitation treatment specification users forum. American Congress of Rehabilitation Medicine Workshop. Chicago, United States.

Turkstra, L.S. (2022, March). Social cognition and communication in acquired brain injury in adolescents and adults. Neuropsychology Association of North America. New Orleans, United States.

Turkstra, L.S. (2022, February). Social communication after acquired brain injury: What does it take to succeed (and are women better than men)? BrainSTEPS. Colorado, United States.

Turkstra, L.S., Bosch, J. & Kho, M. (2022, December). Everyday cognitive complaints of adults with long COVID: Survey results and clinical considerations. COVID Network of Networks. Ontario, Canada.

Ulmer, S., Palla, A., Fuchs, C., Simard, N. & **Noseworthy, M.D.** (2022, July). Beyond conventional MRI: improving sensitivity in mTBI imaging of individual patients - a case-control-study. International Neurotrauma Symposium. Berlin, Germany. (Poster)

Ulmer, S., Palla, A., Fuchs, C., Simard, N. & **Noseworthy, M.D.** (2022, September). Improving sensitivity in mTBI imaging of individual patients – beyond conventional MR imaging. A case-control-study. Swiss Federation of Clinical Neuro-Societies Congress. Basel, Switzerland. (Poster)

VanEvery-Albert, K. & **Kučerová, I.** (2022, November). Adult immersion consortium. Talk presented at the 24th Indigenous Knowledge Symposium: Indigenous Language Revitalization. Queen's University, Kingston, Canada.

Zhu, C., Doyle, T. & **Noseworthy, M.D.** (2022, May) Quantifying operator and hardware variability in diagnostic ultrasound using principle component analysis and k-means clustering. European Society of Radiology (ESR). Vienna, Australia.

Żygis, M., Lorenc, A., **Pape, D.**, Mik, L. & Soskuthy, M. (2022, June). On the necessity of exploring individual variation. Proceedings of the International Conference on Laboratory Phonology (Labphon18). Hanyang University, Seoul, South Korea.

GRANTS

2022 was another big year for ARiEAL researchers as we have secured more funding for our research, knowledge mobilization, and training activities. ARiEAL researchers have won **10 new research grants**, for a total of more than **$1.65 million dollars**, as Principal Investigator and co-applicants from both internal and external sources. Funding sources include McMaster University, Canadian Institute of Health Research (CIHR), Natural Sciences and Engineering Research Council of Canada (NSERC), Social Sciences and Humanities Research Council (SSHRC), Atlas Centre for Veterans and Families, New Frontiers in Research Fund (NFRF), as well as various institutions.

Biggs, A. Building accessible and flexible learning tools for linguistic analysis. McMaster University Partnered in Teaching and Learning Seed Grant, $4,000, 2022.

Kučerová, I., Gonzalez, A., Orr, E. & DeCaire, R. Language revitalization in infants: Lullabies as a tool to promote intergenerational mobility, Indigenous health and community well-being. New Frontiers in Research Fund, Exploration Grant, $248,546, 2022-2024.

Kučerová, I. Undergraduate summer students funding. McMaster University, Associate Vice President Research Support for Research Centres and Institutes, $6,000, 2022.

Kuperman, V., Detlor, B., Gillett, J., **Sonnadara, R.** & Vrkljan, B. Bringing hope and well-being to community-dwelling older Ontarians in the pandemic world through creative writing and digital literacy learning. Future of Canada Project Research Grant (supported by McMaster Chancellor Emeritus L.R. Wilson), $140,000, 2022-23.

Schmidtke, D. & **Moro, A.** Beyond bridging: linguistic indicators of academic and literacy outcomes of international students in a Canadian university. Social Sciences and Humanities Research Council, Insight Development Grant, $53,369, 2022-2023.

Pai, N., Morrison, K., Steinberg, G., **Noseworthy, M.D.**, Thabane, L., Gutierrez, C., Obeid, J., Tibelius, S., Hutton, E., Punthakee, Z., Wahi, G., Gunn, E. & Hill L. The efficacy of soluble dietary fibre supplementation for the treatment of paediatric non-alcoholic fatty liver disease (NAFLD). Canadian Institute of Health Research, Project Grant, $707,625, 2022-2027.

Pape, D. & Bulakh, M. Postdoctoral research grant with the initiative Special Response Fund for Trainees (Ukraine). Natural Sciences and Engineering Research Council of Canada, $45,000, 2022.

Service, E. The impact of temporal patterns on short-term memory for speech and on language learning. Natural Sciences and Engineering Research Council of Canada, Discovery Grant, $140,000, 2022-2027.

Turkstra, L.S. & Bosch, J. Symptom-targeted cognitive rehabilitation for Canadian veterans with TBI and PTSD. Atlas Institute for Veterans and Families, $73,000, 2022.

Turkstra, L.S., Bosch, J., Davis, H., Décary, S., Fitzgerald, M.L., Guardascione, E., Kho, M.E., Loncke, J.M., Pergolotti, M. & Wei, Y. Symptom-targeted rehabilitation for cognitive complaints after COVID (STAR-C3). Canadian Institute of Health Research, Project Grant, $240,000, 2022-2023.

IMPACT

Every year, ARiEAL strives to produce ethically conscious research that engages with a diverse global scientific community and that impacts our broader society. Our trainees have particularly been at the forefront of ARiEAL's research output as several of our undergraduate, graduate, and postdoctoral trainees published articles in high impact journals, presented their work at international conferences, and won prestigious research grants and awards. In 2022, we also responded to the humanitarian crisis caused by the war in Ukraine and hosted four Ukrainian nationals that were displaced from their homes and home institutions. We also began working on a new strategic plan that further highlights ARiEAL's future direction and reaffirms our commitments to support ethical and collaborative research with marginalized and underrepresented communities. Finally, 2022 saw the return of our in-person speaker and learning events. Though many retained a hybrid format, it was great to see the return of our researchers and trainees at ARiEAL.

VIRTUAL ENGAGEMENT

In 2022, ARiEAL moved away from our plone-based website and we are now on a WordPress platform. This change will allow our website to grow as a resource hub as it will allow greater flexibility with the type of media and content we can include and will provide a more seamless integration with the other Faculty of Humanities websites. During 2022, our official Twitter handle reached over 45,000 impressions, with 206 tweets and retweets, 587 likes, 115 retweets by our followers, and exceeded 2,600 engagement counts. Our Instagram account, now with 519 followers, has continued to foster engagement, specifically with former and current undergraduate and graduate students. In 2022, we had over 50 posts, 1293 likes, and over 100 comments. One of our most popular series of posts on ARiEAL Instagram is the Spotlight Series where our researchers, trainees and staff were featured to share their research and fun facts about themselves! These have given us the opportunity to learn more about the terrific research and individuals at ARiEAL and helped create a greater sense of community. Though 2022 has seen the return of more in-person work, a virtual platform continues to provide a meaningful way to engage with our researchers (past and present) and the broader academic and non-academic community.

TRAINEE SPOTLIGHT:
HARSHDEEP DHALIWAL

Research Interests: reading proficiency

Harshdeep Dhaliwal (she/her) is a third-year undergraduate student in the Honours Biology and PNB program at McMaster. She is a student research assistant in the Reading Lab and is interested in the effect distracters have on reading proficiency. Fun Fact: In her free time, Harshdeep writes blogs for GirlUpMcMaster and McMaster's Mental Health Student Support Network, and loves learning new languages!

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Centre for **Advanced Research** in Experimental & Applied Linguistics

SPEAKER & LEARNING SERIES

As we return to campus after the Covid-19 pandemic, the year 2022 saw the return of more in-person events at ARiEAL. We continued our tradition to invite world renown researchers, such as Dr. Catherine Best, Dr. Steve Majerus, Dr. Elisangela Teixeira, and our very own Dr. Anna Moro and Dr. Daniel Schmidtke, to share their vast wealth on knowledge. This year, we also encouraged our own community of researchers and trainees to share their work-in-progress in a new Brown Bag series. This series provides trainees and faculty members with a casual setting where they can present and workshop work-in-progress for some constructive feedback from our team at ARiEAL. We also provided various opportunities for trainees of all levels to develop and refine their skills with the ARiEAL Learning Series. For instance, Audrey Ho hosted a workshop on effective presentations that was attended by many of our trainees. Nadia Lana, Mikayla Schuett, Evonne Syed, and Sophia Yang also provided great advice to our trainees that are thinking of applying to speech language pathology programs. Our trainees have played an important leadership role in our Learning Series.

LEARNING SERIES

Nadia Lana, PhD Candidate, Cognitive Science of Language, Department of Linguistics and Languages, McMaster University; Mikayla Schuett, MSc student, Speech Language Pathology, University of Western Ontario; Evonne Syed, MSc student, Speech-Language Pathology, McMaster University; Sophia Yang, MHSc student, Speech Language Pathology, University of Toronto. Applying to speech language pathology programs workshop. November 22, 2022.

Audrey Ho, MSc Student, Cognitive Science of Language, Department of Linguistics and Languages, McMaster University. Effective presentations workshop. November 3, 2022.

Dr. Arig al Shaibah, Associate Vice-President, Equity and Inclusion, University of British Columbia. Applying an EDI lens in research. March 30, 2022.

Hans Wijgh, Founder and CEO of Creative Commercialization. Applying your language research skills outside of academia. March 3, 2022.

SPEAKER SERIES

Dr. Elisangela Teixeira, Director, Laboratory of Cognitive Sciences and Psycholinguistics, Federal University of Ceará, Brazil. Language acquisition and language processing studies in Brazilian Portuguese. June 17, 2022.

Dr. Steve Majerus, Research Professor & Director, Psychology & Neuroscience of Cognition Research Unit, University of Liège, Belgium. The boundaries of linguistic determinants of verbal working memory. April 4, 2022.

Dr. Anna Moro, Director, MELD, McMaster University; Dr. Daniel Schmidtke, Postdoctoral Fellow, MELD, McMaster University. Tracking reading in a second language: Perspectives from a university bridging program. March 21, 2022.

Dr. Catherine Best, Chair, Psycholinguistic Research, Western Syndey University, Australia. Attunement to native speech in year 1 provides grounding for recognition of familiar words across unfamiliar regional accents in year 2. February 7, 2022.

Woodland Cultural Centre. Mohawk Institute Residential School virtual tour and debrief. January 10, 2022.

BROWN BAG SERIES

Dr. Ivona Kučerová, Director of ARiEAL & Associate Professor, Department of Linguistics and Languages, McMaster University. Indigenous language revitalization: University-lab-based perspective. November 11, 2022.

Dr. Gemma Repiso Puigdelliura, Assistant Professor, Department of Linguistics and Languages, McMaster University. The production of Spanish rhotics by Spanish heritage speakers: variation and development. October 12, 2022.

ARiEAL Speaker Series: *Brown Bag Lunch*

Indigenous Language Revitalization: University-Lab-Based Perspective

Friday, November 11, 2022

12:00-1:00 pm
Join us for an informal 45-50 minute "brown bag" (bring your own lunch) Speaker Series!

Abstract: Language Revitalization efforts have taken many shapes within Indigenous communities over the years. Adult immersion is an area of less focus. Working in partnership with three Haudenosaunee adult immersion programs in the Six Nations, Oneida of the Thames, and Tuscarora New York communities to identify best practices in Haudenosaunee adult immersion, Dr. Kučerová and her team are investigating the areas of curriculum, methodology, justification, and how a university-based language science lab can contribute to successful language reclamation. In this presentation, she will share the evolution of their partnership, research, and desired outcome.

Presented by: Dr. Ivona Kučerová

L.R. Wilson Hall 4018

BRIGHTER WORLD | mcmaster.ca

Any inquiries can be addressed to arieal@mcmaster.ca

Centre for Advanced Research in Experimental & Applied Linguistics

UKRAINE

From a global perspective, 2022 was another difficult year for research and researchers. Particularly, the war in Ukraine created uncertainty and hardship for fellow displaced researchers.

Responding to the humanitarian crisis caused by the war in Ukraine, ARiEAL – with the support of McMaster's Scholar-at-Risk program – has hosted four Ukrainian nationals that were displaced from their homes and home institutions. These include: Mariia Hryntus, Dr. Alina Dochu, Dr. Maiia Bulakh, and Olga Dvorova. Each arrived at ARiEAL between March and September 2022 and the result has been a productive and collegial research environment enabling these scholars to continue their research.

All have become incredible additions to our research, knowledge mobilization, and training activities. Since their arrival, they have participated in numerous research and knowledge mobilization activities, such as workshops, speaker events, and Brown Bags; they have developed research collaborations and exchanged relevant scientific with researchers and trainees; and they have helped organized in-person and online research workshops and other knowledge mobilization activities. Importantly, thanks to the supervision provided by our members, they have received relevant research expertise and connections to North American researchers.

(Photo by Colin Czerneda c/o McMaster University)

DR. ALINA DOCHU

(Photo by Georgia Kirkos c/o McMaster University)

OLGA DVOROVA

OUR TRAINEES' IMPACT ON ACADEMIA

Our researchers are not the only ones that are producing ground-breaking and innovative research, but our trainees are as well. In 2022, several of our trainees, from undergraduate to postdoctoral, have published their research in several high impact journals, presented at numerous local and international conferences and community events, and won several prestigious awards.
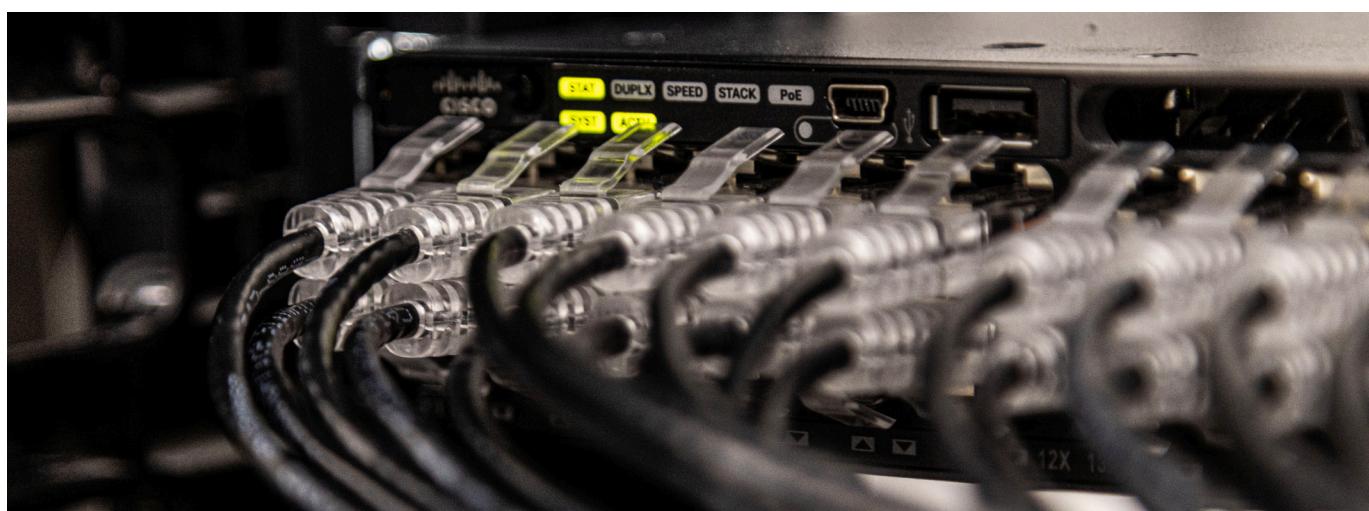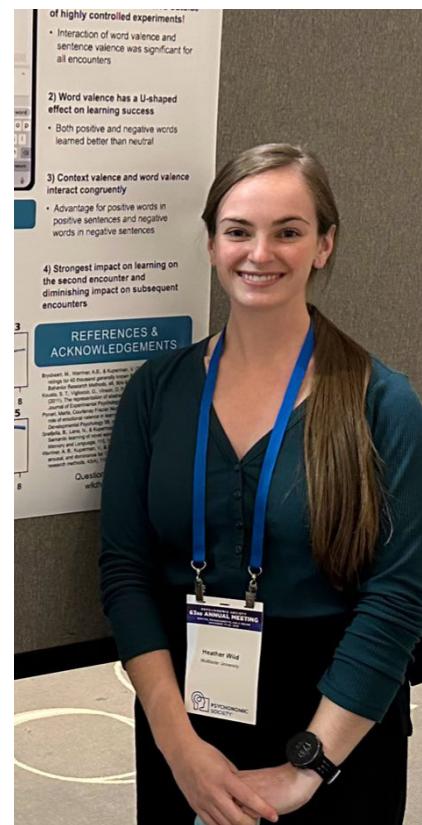
PUBLICATIONS:

Cermak, C., Scratch, S., Reed, N., **Kakonge, L.** & Beal, D. (2022). Effects of pediatric traumatic brain injury on verbal IQ: A systematic review and meta-analysis. Journal of the International Neuropsychological Society, 28(10), 1091-1103.

Kakonge, L., Charron, V. P., Vedder, J., Wormald, K. & Turkstra, L. S. (2022). A mapping review of adolescent identity after TBI: What clinicians need to know. Neuropsychological Rehabilitation, 32(8), 1868-1903.

Jethava, V., Kadish, J., **Kakonge, L.** & Wiseman-Hakes, C. (2022). Early attachment and the development of social communication: A neuropsychological approach. Frontiers in Psychiatry, 13, 838950.

Nenadić, F., Podlubny, R.G., **Schmidtke, D.**, Kelley, M.C. & Tucker, B.V. (2022). Semantic richness effects in isolated spoken word recognition: Evidence from massive auditory lexical decision. Journal of Experimental Psychology: Learning, Memory, and Cognition. Advanced Online Publication.

Owusu, B., Dhanoa, J., Hylton, A., Ing, E., Mappanasingam, A., Patel, A., Pavlakos, R. & de Bie., A. (2022). Student voices from the classroom: Concluding reflections on cultivating an environment where learning deeply matters. In A. de Bie, S. Baptiste, C. A. Grisé (Eds.). Where learning deeply matters: Reflections on the past, present, and future of teaching at McMaster University, 1(1): 1-19.

Mighty, J., Braithwaite, A., Deng, J., Huang, S., Leacock, B., Lopes, V., MacDonald, M., Pérez, R. N., **Owusu, B.** & Toulouse, P. (2022). Misalignment, negotiation, and compromise: The challenging process of pursuing equity, diversity, and inclusion in higher education. Invited chapter in J. Christensen Hughes, J. Mighty, D. Stockley and L. Young (Eds.). Taking Stock 2.0: Transforming Teaching and Learning in Higher Education.

Saly, L., Marshall, S. A., Mallory, K. D., Hunt, A. W., **Kakonge, L.**, Provvidenza, C., Hickling, A., Stevens, S. A., Bennett, S. & Scratch, S. E. (2022) Pediatric acquired brain injury resources for educators: A multi-year scan of Canadian-relevant internet resources. Brain Injury, 37:4, 337-351.

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Rana, F., Pape, D. & Service E. (2022). The effect of increasing acoustic and linguistic complexity on auditory processing: an EEG study. Proceedings of the International Speech Communication Association Interspeech, Incheon, Korea, 4048- 4052.

Wild, H. A., Kyröläinen, A.-J. & Kuperman, V. (2022). How representative are student convenience samples? A study of literacy and numeracy skills in 32 countries. PLOS One, 17(7), 1-22.

Wild, H.A. & Kuperman, V. (2022). Technical report on using in-house English-speaking assessments to place Mohawk College students in communication classes. McMaster University.

PRESENTATIONS:

Bekhet, M., Lana, N. & Pape, D. (2022, March). Accent or expectation? Investigating the relationship between accented English and psychological valence perception. Montreal-Ottawa-Toronto Phonology/Phonetics Workshop (MOT) 2022. Virtual. (Poster presentation)

Kakonge, L. (2022, May). Adolescent identity after traumatic brain injury. The Brain Injury Canada Conference. Virtual

Lana, N. (2022, March). Writing plain language abstracts. Words in the World Partnership. Virtual.

Owusu, B. & Service, E. (2022, November). Can rhythmic stimulation benefit verbal memory? NeuroMusic 18th Annual Conference. McMaster University, Ontario, Hamilton.

Schmidtke, D., Rahmanian, S. & Moro, A. (2022, July) Tracking reading development in an English lan- guage bridging program: Evidence from eye-movements during passage reading. Twenty- Ninth Annual Meeting of the Society for the Scientific Study of Reading. Newport Beach Marriott Hotel & Spa, Newport Beach, USA.

GRANTS & AWARDS:

Campbell, J. Harry Lyman Hooker Sr. Fellowship, McMaster University, 2022.

Kakonge, L. School of Rehabilitation Science Publication Award, McMaster University, 2022.

Lana, N. Mary Keyes Award for Out-standing Leadership and Service to McMaster. Graduate Student Recognition Awards, McMaster University, 2022. (Nominee).

Lana, N. Ontario Graduate Scholarship (OGS), 2022.

Lana, N. & Bekhet, M. ARiEAL Research Explained. McMaster University Paul R. MacPherson Institute for Leadership, Innovation, and Excellence in Teaching Grant, 2022.

Lana, N. & Lin, C.-Y. Expanding the reach: Developing an engaging and interactive resource hub for effective community outreach. McMaster University Paul R. MacPherson Institute for Leadership, Innovation, and Excellence in Teaching Grant, 2022.

Owusu, B. Faculty of Health Sciences Plenary Graduate Student Leadership Award, McMaster University, 2022.

Schmidtke, D. & Moro, A. Beyond bridging: linguistic indicators of academic and literacy outcomes of international students in a Canadian university. Social Sciences and Humanities Research Council Insight Development Grant, 2022.

Yau, A. Dean's Honour List, McMaster University, 2022.

EDI IN RESEARCH DESIGN AND PRACTICE

ARiEAL has always been committed to equity, diversity, and inclusion in both research design and research practice. However, there is always room to grow, and we can always do better as a research center. In 2022, we have reaffirmed our commitments to support ethical and collaborative research with marginalized and underrepresented communities and support research that is guided by, for, and benefits marginalized and underrepresented communities.

We took important steps in the creation of our new EDI-conscious Scientific Advisory Committee (SAC). We created an EDI taskforce of ARiEAL members, researchers, and trainees to assist in this process. The taskforce has met established guidelines for the composition, role, and size of the SAC as well as a search criterion to guide our selection process. We hope to select our new SAC by Fall 2023. As mentioned above, in light of the humanitarian crisis caused by the war in Ukraine, we expanded our International Scholar Award Program to include early career researchers and trainees from Ukraine. Included is Dr. Alina Dochu is a Crimean Tatar, a member of a Muslim nation that underwent several rounds of violent displacement and cultural genocide in Crimea/Ukraine. Our researchers have also continued to support collaborative research with marginalized and underrepresented communities, including with Six Nations and other Indigenous communities, such as the Mohawk, Oneida, Tuscarora, and Seneca people, people with disabilities, and researchers from institutions that are from underrepresented nations in academic settings.

A NEW STRATEGIC VISION

In 2022, we started working on a new mission, value, vision, and strategic plan that highlights ARiEAL's future direction. Engaging in numerous discussions, town hall meetings, and workshops with our members, researchers, and trainees about ARiEAL, we developed a new vision and new goals for our research program, our knowledge mobilization activities, and training and mentoring responsibilities. Focusing on our strengths, the strengths of our researchers and trainees, and the recommendations made by the recent ERB report, our new mission, value, vision, and strategic plan reaffirms our commitments to the type of research and research activities that have made ARiEAL a world-class research center, but they also demonstrate our willingness to grow and expand as a research centre.

While we remain fully committed to our full-circle reciprocal approach, where fundamental research both informs applied research, and is grounded in the knowledge generated from the applied research, we aim to: 1. enhance our community and Indigenous-based research and deepen our role as an effective and collaborative ally, 2. enhance our global research and knowledge mobilization collaborations, 3. provide more training, mentorship, and research opportunities to undergraduate and graduate students, postdoctoral fellows and early career researchers at ARiEAL, including international early career researchers and trainees from underserved countries and war-zone countries, 4. support ethical and collaborative research with marginalized and underrepresented communities.

OPERATIONS TEAM

In 2020, ARiEAL established a trainee-based operations team known as the ARiEAL Operations Team (hereafter referred to as AOT). First working collaboratively with former ARiEAL manager, Chia-Yu Lin, and now with new manager, Dr. Maxime Dagenais, the AOT supports our center's knowledge mobilization and learning activities, social media engagement, and event planning. The AOT operates on a one-year renewable term and provides hands-on opportunities for undergraduate and graduate trainees to not only participate but also lead the endeavours in knowledge mobilization and the planning of various events. ARiEAL was able to continue expanding its reach through LinkedIn, Twitter, and Instagram with the leadership and creativity demonstrated by Nadia Lana and Siyuan Huang (Knowledge Mobilization Coordinator and Office Assistant, respectively). Fiza Ahmad and Fan Yang (Learning Series Coordinators) organized valuable learning events on key topics such as effective presentations, applying an EDI lens in research, and applying your language research skills outside of academia. And while Monika Krizic (Speaker Series Coordinator) played a major getting our new Brown Bag series off the ground, Harshdeep Dhaliwal and Catherine Bosyj (Social Coordinators) helped organize some much-needed, light-hearted breaks from our research and work, including our first in-person winter party in years.

DR. MAXIME DAGENAIS

FAN YANG

NADIA LANA

MONIKA KRIZIC

HARSHDEEP DHALIWAL

SIYUAN HUANG

SCIENTIFIC ADVISORY COMMITTEE

In 2022, we took important steps in the creation of our new EDI-conscious Scientific Advisory Committee (SAC). We created an EDI taskforce of ARiEAL members, researchers, and trainees to assist in this process. The taskforce has met established guidelines for the composition, role, and size of the SAC as well as a search criterion to guide our selection process. We will select our new SAC in 2023.

THE CENTRE

Founded in late 2016, ARiEAL celebrated its sixth full calendar year since its inception in 2022. We are proud of the mentorship demonstrated by our researchers and our amazing trainees of all levels and the incredible and important research that they are creating.

DIRECTOR
(from July 1, 2021 onwards)

Dr. Ivona Kučerová
(Department of Linguistics and Languages, McMaster University)

FOUNDING DIRECTOR

Dr. John Connolly
(Department of Linguistics and Languages, McMaster University)

ASSOCIATE DIRECTOR

Dr. Anna Moro
(Department of Linguistics and Languages, McMaster University)

MEMBERS

Dr. Sue Becker
(Department of Psychology, Neuroscience & Behaviour, McMaster University)

Dr. Alison Biggs
(Department of Linguistics and Languages, McMaster University)

Dr. Victor Kuperman
(Department of Linguistics and Languages, McMaster University)

Dr. Michael Noseworthy
(Department of Electrical and Computer Engineering, McMaster University)

Dr. Daniel Pape
(Department of Linguistics and Languages, McMaster University)

Dr. Jim Reilly
(Department of Electrical and Computer Engineering, McMaster University)

Dr. Elisabet Service
(Department of Linguistics and Languages, McMaster University)

Dr. Ranil Sonnadara
(Department of Surgery, McMaster University)

Dr. Lyn Turkstra
(School of Rehabilitation Science, McMaster University)

INTERNATIONAL COLLABORATORS:

Basque Center on Cognition Brain and Language, San Sebastián, Spain

Bundled Arrows Inc., Niagara Falls, NY, United States

Centro de Ciencia Cognitiva (C3), Madrid, Spain

Haskins Laboratories, New Haven, Connecticut, USA

Khovd State University (Department of Foreign Languages and Culture Studies, School of Social Sciences and Humanities), Khovd, Mongolia

Lesya Ukrainka Volyn National University, Lutsk, Ukraine

Onkwawenna Kentyohkwa, Ohsweken, ON, Canada

National Academy of Sciences of Ukraine (O. O. Potebnia Institute of Linguistics), Kyiv, Ukraine

Tilburg University (Department of Cognitive Science & Artificial Intelligence at the School of Humanities and Social Sciences), Tilburg, Netherlands

Twatati Oneida Language Committee, Southwold, ON, Canada

University of Turku (Department of Psychology and Speech-Language Pathology), Turku, Finland

Words in the World (WoW), Partnership Grant funded by the Social Sciences and Humanities Research Council of Canada (SSHRC), Canada

OPERATIONS SUPPORT

MANAGER, DEVELOPMENT & RESEARCH

Chia-Yu Lin (until June 2022)

RESEARCH PROGRAM MANAGER

Dr. Maxime Dagenais
(from September 2022)

OFFICE ASSISTANTS

Vidhi Patel (January 2022 – April 2022)

Siyuan Huang
(October - December 2022)

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Nadia Lana
(January 2022 – December 2022)

Mariam Bekhet
(January 2022 – April 2022)

LEARNING SERIES COORDINATORS

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(January 2022 – April 2022)

Fiza Ahmad
(January 2022 – April 2022)

Fan Yang
(April 2022 – December 2022)

SOCIAL COORDINATORS

Catherine Bosyj
(January – April 2022)

Harshdeep Dhaliwal
(April 2022 – December 2022)

SPEAKER SERIES COORDINATOR

Monika Krizic
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Laura Schwalm
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Dr. Maiia Bulakh
(Supervised by Dr. Daniel Pape)

Dr. Alina Dochu
(Supervised by Dr. Ivona Kučerová)

Dr. Daniel Schmidtke
(Supervised by Dr. Anna Moro)

Dr. Bhanu Sharma
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*COMPLETED PROGRAM IN 2022

McMaster University

Produced & Designed by Maxime Dagenais, Siyuan Huang, and the Underground

Many thanks to all ARiEAL members and trainees for their contributions to this report

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