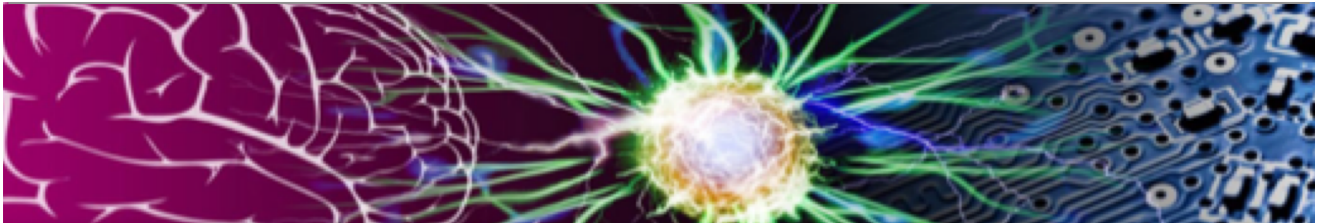# INSTITUTE OF COGNITIVE SCIENCE

Newsletter | Fall | 2017

SIDNEY D'MELLO

As Associate Professor **Sidney D'Mello** enters his first winter in Boulder, he reflects on the Chalk Talk presented as a part of his interview in order to officially join ICS. By nature, the talks are informal, more discussion than lecture, and has burgeoned into an outline of what he was excited to embark upon through the Institute.

"The reason I moved here was to rediscover and to try new things," D'Mello explained. "I recently thought of the exciting things I listed a year ago—how many am I actually doing now that I'm here?"

His answer? All of them.

D'Mello and his colleagues continue unpacking "distributed cognition" – cognition that extends beyond the individual to collections of interacting individuals and the environment. In one study, they investigate distributed attention and intention while groups of 2-4 engage in visual search, with the caveat that communication is based entirely on shared eye-gaze.

D'Mello also mentions shifting some of his focus from student learning to teacher learning. This work adopts a discourse analytics approach to provide teachers with formative, non-punitive feedback on the quality of their classroom discourse.

Another item from D'Mello's Chalk Talk was his interest to "scale-up" his research. Along these lines, in one study, they are tracking 100,000 students over the course of the year. Though it brings on a new set of challenges, D'Mello explains that scaling-up also offers previously untapped opportunities, such as being able to spot changes and trends within a large school district.

Through ICS, D'Mello has taken his original aspirations and expanded upon them. ICS looks forward to the research coming out of the D'Mello Lab.

Institute of Cognitive Science
UNIVERSITY OF COLORADO **BOULDER**

LETTER FROM THE DIRECTOR
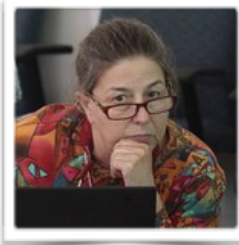
Dear Colleagues,

We have accomplished a lot in 2017! We began the year with three "resolutions" and our community made significant progress on all of them. First, we set out to strengthen our research portfolio and impact. This year, ICS and our research partners received over $20 million in new sponsored research awards, including new NIH awards to study the influence of cannabis on pain, inflammation and cognition, and new NSF and IES awards to expand our research on learning and education. As you will see in the stories in this newsletter, our research directly impacts 10's to 100's of thousands of K-12 students in Colorado and across the nation.

Second, we began the process of changing how we work together, creating new opportunities for rich scientific discussions and interdisciplinary research collaborations. These opportunities took many forms, such as the Cognitive Neuroscience Roadmapping Workshop and the Learning Technologies Meet-Up. Feedback from these events has been very positive. At the last faculty meeting we discussed how to encourage more of these events, and came up with an interesting idea for developing our collective knowledge about a new topic: themed series of colloquia talks. You can read about our inaugural series - the Human Sensing Series - to take place this spring elsewhere in this newsletter. If you have ideas for an interesting and collaborative community event, please come see me and let's make it happen!

And finally, we wanted to grow our community and encourage broader participation and leadership within our Institute. We welcomed new tenure track faculty, research professors, fellows, and staff this year and had several colloquia with standing room only. Keep this in mind for next year: the early bird gets the good lunch pickings and also a chair! Our Executive Committee provided excellent leadership in revamping and carrying out our annual merit review process for tenure track faculty last spring and we plan to extend this approach to research professors in 2018.

2018 will also be a busy and important year for us. We will be preparing for the Academic Review and Planning Advisory Committee's (ARPAC) review of our Institute, which will take place in spring 2019. While this sounds like a long time from now, we have lots to do and will be asking for your guidance and participation at various points along the way. Central to this process is a self-study of key aspects of our strategy and operations, i.e., our strategic plan, research productivity, educational programs, climate and morale, finances, etc. Our self-study will take place this year. This is a great opportunity to examine what we do with fresh eyes and come up with creative ways to improve our processes and community functioning. It's also a good time to outline to the University administration the resources that we need moving forward to raise our research and educational programs to the next level. So, give this some thought and come prepared to discuss our options. I will be working with our Executive Committee to plan two community-wide membership meetings, one in spring semester and one in fall. These will be scheduled during our normal colloquium slot on Fridays from 12 - 2pm, with the dates to be announced later.

I will keep you updated as I learn more about the process. However, there are a few things that you can do right now to help out and get this process off to a strong start.

#1: Update your CV! As you can imagine, a significant part of the self-study is documenting what we have all done since the last review in 2012. The simplest way to do this is to pull this information out of your CV. At some point in the near future, we will be sending around a request for CV's to begin this compilation process and we will be asking everyone, including graduate students, to share their accomplishments.

#2: Release your 2017 FRPA to the Institute of Cognitive Science. It is particularly important that all ICS faculty and fellows (our members from our affiliated departments) remember to do this. It is a lot of work to put together these annual evaluations so let's make the most of it and use this information for multiple purposes.

Finally, before closing, I would like to acknowledge the wonderful contributions of our community supporters, donors, and volunteers. We have been working with our development office over the past few weeks to make sure that all donations were processed in time for this tax year. It is particularly gratifying to see our alumni stepping up and giving back to support the next generation. Thank You!

Cheers, Tammy Sumner

ICS PUBLICATIONS

Albers Szafir, Danielle. (2018). "Modeling Color Difference for Visualization Design." IEEE Transactions on Visualization and Computer Graphics.

Albert, D., Nussbaumer, A., Kuo, B., **Foltz, P. W**., & Hu, X. (2017). Competence-based Knowledge Structures and Current Challenges for E-Assessment, In R. Sottilare, A. Graesser, X. Hu, & G. Goodwin (Eds.), *Design Recommendations for Intelligent Tutoring System*s: Volume 5 - Assessment. Orlando, FL: U.S. Army Research Laboratory.

Bowles, A. R., & **Healy, A. F**. (2017). Training and transfer of word identification: Foreign language speech rate. *Journal of Applied Research in Memory and Cognition, 6,* 253-259.

Diaz, Catherine, Walker, Michael, **Albers Szafir, Danielle**, **Szafir, Daniel** (2017). "Designing for Depth Perceptions in Augmented Reality." In the Proceedings of the IEEE International Symposium on Mixed and Augmented Reality (ISMAR). Pp. 111-122.

D Quigley, JL Ostwald, **T Sumner**. S*cientific modeling: using learning analytics to examine student practices and classroom variation*. LAK, 329-338

Foltz, P. W. & Rosenstein, M. (2017). Data mining large scale formative writing. In G. Siemens, C. Lang & D. Gasevic (Eds), *Handbook of Learning Analytics and Educational Data Mining.* Society for Learning Analytic Research.

INC Studies the Young Brain

Nicole Speer, ICS's Director of Operations for the Intermountain Neuroimaging Consortium details INC's latest work: INC has been staying busy this summer and fall as we work to support a handful of newer studies as well as the longitudinal, intervention, and developmental studies that have been running for 2-3 years. INC researchers continue to be focused on the concepts of brain health (how do behaviors such as exercise impact brain function, how do various treatments for chronic pain influence pain perception), as well as brain development (how does the brain change with puberty and adolescence, how does poverty impact newborn infants' brain structure).

Kendra Huber, who works primarily at the Brain Imaging Center at Anschutz, joined INC on-call MRI staff over the summer to assist with weekend scanning. With the large increase in studies collecting data on infants, children, adolescents, and working adults there has been an accompanying increase in weekend scanning. We are thrilled to have Kendra on board and appreciate her additional work for our center!

INC has continued its outreach work this year with tours of the facility for K-12 and college students and lessons in local elementary schools. Be on the lookout for Brain Awareness Week 2018 events during the middle of March.
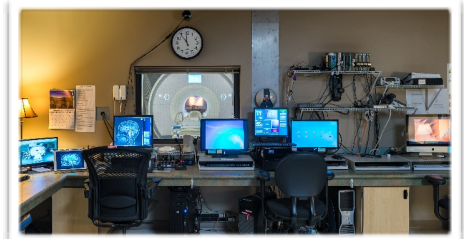
The INC research facility.
Photo by Teryn Wilkes

ICS FELLOW AWARDS

ICS Fellow Dr. **Danielle Szafir** was named on the Forbes Science "30 Under 30" list for 2017.

Szafir also won a Best Paper Award for "Modeling Color Difference for Visualization Design" at the IEEE Visualization Conference.

Szafir develops interactive visualization systems and techniques for exploring large and complex data in domains ranging from biology to the humanities. Her work focuses on increasing the scalability and comprehensibility of information visualization by quantifying perception and cognition for design. She also explores how vision science might inform more effective visual interfaces for graphical technologies, including mobile devices and augmented reality.

ICS CONGRATULATES

ICS would like to congratulate Assistant Research Professor **Cinnamon Bidwell** and Assistant Professor **McKell Carston** on their reappointments and comprehensive reviews. Carston continues his "brain-centered approach to characterizing social effects on decision making." Bidwell continues her exciting work with CU REACH as well as studying "the direct neurobiological effects of drugs of abuse, including high potency marijuana and cannabinoids in psychiatric and medical populations and the direct physiological and behavioral effects of cannabinoids as they pertain to both their abuse potential and potential therapeutic effects in observational as well as double-blind, placebo controlled human laboratory studies."

ICS congratulates promoted Associate Research Professor **Jennifer Jacobs**. Jacobs' primary research interests are in classroom teaching, teacher and student learning, and teacher professional development. Most recently, Jacobs has helped to develop and study the impact of two mathematics professional development programs, both supported by the National Science Foundation.

Congratulations to **Martha Palmer**, named as one of the 2017 Professors of Distinction by the College of Arts and Sciences in recognition of their exceptional service, teaching and research. Honorees of this award hold this title for the remainder of their careers in the College of Arts and

NEW ICS FELLOW

ICS welcomes Computer Science Assistant Professor **Chenhao Tan**. Tan obtained his PhD degree in the Department of Computer Science at Cornell University and bachelor's degrees in Computer Science and in Economics from Tsinghua University (Beijing Shi, China). His research interests include natural language processing and computational social science.

ICS VISITING SCHOLARS

Dr. **Ahmed Mohamed Fahmy Yousef** is a Fulbright scholar who holds a PhD from RWTH Achen University, Germany. He joined The University of Colorado Boulder on The Core Fulbright Scholar Program Award for academic year 2017-2018. His research focuses on learning technologies and instructional design in computer science education.

Dr. **Jonas Tesarz** visits from the Heidelberg University, where he works as a senior physician and assistant professor at Department of General Internal Medicine and Psychosomatics. His research goals are directed toward the understanding of the interactions between emotional stress and pain processing. His scientific work now encompasses the role of psychosocial factors in the development and maintenance of chronic back pain. Tesarz is invited to conduct research on establishing neurophysiological markers of the underlying mental processes.

ICS WELCOMES

Yasko Endo will be joining ICS for a short-term, part-time appointment from January through June 2018. Endo will be helping the Institute to improve our communications, marketing and outreach. Endo has been working in the Department of Computer Science at CU for the past 6 years, managing and co-directing the Scalable Game Design project which pioneered new methods for introducing children to programming.

Katie Bershenyi is the new administrator in the ICS Muenzinger office. Bershenyi graduated from CU and comes from a background of teaching High School English and Spanish. She is excited to be a part of the ICS team.

ICS welcomes Assistant Research Professor **Katie Van Horne**. Van Horne's research areas include learning sciences theory and developing new methodologies for studying how youth pursue interest-related activities and learning during out-of-school time. She is partnering with other researchers to develop new computational methods for studying connected learning at scale.

ICS PUBLICATIONS

Hinojosa, Leighanna. *Encountering and Becoming Role Models Underrepresented in STEM.*

Lai, E. R., DiCerbo, K. E., & **Foltz, P.W.** (2017). Skills for Today: What We Know about Teaching and Assessing Collaboration. Partnership for 21st Century Skills.

Rafael Frongillo and Jens Witkowski. "A Geometric Perspective on Minimal Peer Prediction." *ACM Transactions on Economics and Computation (TEAC) (2017)*

Graesser, A.C., **Foltz, P.W.**, Rosen, Y., Shaffer, D.W., Forsyth, C., and Germany, M. (2017). Challenges of assessing collaborative problem solving. In E. Care, P. Griffin, and M. Wilson (eds.), *Assessment and Teaching of 21st Century Skills: Research and Applications*. Springer Publishers.

Raymond, W. D., & **Healy, A. F.** (2017). Breaking into the mind: George A. Miller's early work in the *American Journal of Psychology. American Journal of Psychology, 130*, 269-282.

Rus, V., Olney, A. M., **Foltz, P. W.**, & Hu, X. (2017). Automated Assessment of Learner-Generated Natural Language Responses, In R. Sottilare, A. Graesser, X. Hu, & G. Goodwin (Eds.), *Design Recommendations for Intelligent Tutoring System*s: Volume 5 - Assessment. Orlando, FL: U.S. Army Research Laboratory.

Wind, S. A., Wolfe, E. W., Engelhard Jr, G., **Foltz, P. W.**, & Rosenstein, M. (2017). The Influence of Rater Effects in Training Sets on the Psychometric Quality of Automated Scoring for Writing

GRADUATE STUDENT AWARD

ICS graduate student, **Rick Parker**, was selected to receive the annual Ralph Slutz award for 2017.

The Ralph J. Slutz Student Excellence Award in Computer Science was established in 2010 through a gift made by one of Dr. Slutz' former students, Dr. Xiaodong Zhang (MS CompSci '85, PhD '89) to annually recognize students in Computer Science who have established a record of academic excellence and/or technical research and innovation.

Each year, two outstanding graduate students are selected to receive the Ralph J. Slutz Student Excellence Award for their outstanding achievements in their academic career.

ICS THANKS OUR VOLUNTEERS

ICS would like to thank Michael Wright and Russ Rew for their generous volunteer work on behalf of the Institute.

Wright has contributed to several projects in ICS, including developing a website to support Inquiry Hub, our Research + Practice Partnership with Denver Public Schools.

Both Wright and Rew annotated training data for the TalkBack project, which is developing machine learning models capable of automatically identifying important instructional moves during mathematics instruction.

ICS PRESENTATIONS

Caccamise, Donna, **Littrell-Baez, Megan**. (Fall, 2017). *The Boulder Reading Intervention (BRAVO) curriculum for middle school students*. Workshop: Curriculum Study Commission California Council of Teachers of English (CCTE), Pacific Grove, California.

D'Mello, S. K. (October, 2017). *Generation 3 Affect Detection: In the Wild and at Scale*. Keynote at 2nd International Workshop on Automatic Sentiment Analysis in the Wild (WASA 2017) held in conjunction with the 8th International Conference on Affective Computing & Intelligent Interaction (ACII 2017), San Antonio, TX.

Lalchandani, L., & **Healy, A. F.** (2017, November). *On-the-job training of working memory*. Poster presented at the 58th Annual Meeting of the Psychonomic Society, Vancover, British Columbia.

CU REACH

With support from ICS, researchers from across campus convened last fall to begin planning a new multidisciplinary center: the **CU Center for Research and Education Addressing Cannabinoids and Health (CU REACH)**. Center faculty are diverse, examining the effects of Cannabis at the genetic, molecular, neural, behavioral, and dynamic social systems levels of analysis. As noted by ICS **Assistant Research Professor Cinnamon Bidwell**, the "ultimate objective of our research is to provide empirical data that will improve lives." ICS faculty Bidwell and **ICS fellow Hutchison** have recently received several large NIH grants to study the influence of cannabinoids on pain, anxiety, and inflammation. Specific research questions being studied by center faculty and fellows are:

- Can Cannabis play a positive role in solving the opiate epidemic?
- Is Cannabis an effect approach to pain management? And if so, in what forms and what doses?
- What is the impact of Cannabis use in individuals with PTSD and other psychological disorders?
- How is information about Cannabis spread through social systems?
- Deep characterization of cannabinoids and Cannabis plant genetics
- Understand the risks and side effects of Cannabis - which routes of administration, combination of cannabinoids, and doses are least risky?

The Center faculty got off to a terrific start by co-authoring a white paper for the campus's Academic Futures exercise (The full paper is available at: https://www.colorado.edu/ics/2017/11/30/cu-reach-academic-futures-white-paper). This paper highlights the huge potential of this nascent center to conduct outstanding research and discusses several barriers and solutions to streamlining the conduct of research using cannabis. At the direction of Dean Terri Fiez, this spring Center faculty and fellows will begin working with CU legal and research compliance officers to streamline campus policies to reflect a new Colorado state law (HB17-1367) that takes effect on July 1, 2018 that aims to significantly reduce barriers on state campuses for a broad range of cannabis-related research. Also, the Center will be launching a new, monthly colloquium series in 2018 to showcase cannabis-related research on campus. If you are interested in participating in CU REACH, please contact Cinnamon Bidwell (lcb@colorado.edu). If you would like to learn more about the new colloquium series, please contact Brian Keegan (brian.keegan@colorado.edu).

ICS PUBLICATIONS

Goldin, I., Narciss, S., **Foltz, P. W** & Bauer, M. (2017) New directions in formative feedback in interactive learning environments. *International Journal of Artificial Intelligenceand Education*.27(3), doi:10.1007/s40593-016-0135-7

Graesser, A.C., Cai, Z., Hu, X., **Foltz, P.W.**, Greiff, S, Kuo, B-C. Liao, C-H. , and Shaffer, D.W. (2017). Assessment of collaborative problem solving. In R. Sottilare, A. Graesser, X. Hu, & G. Goodwin (Eds.), *Design Recommendations for Intelligent Tutoring System*s: Volume 5 - Assessment. Orlando, FL: U.S. Army Research Laboratory.

D Quigley, C McNamara, J Ostwald, **T Sumner**. *Using Learning Analytics to Understand Scientific Modeling in the Classroom*. Frontiers in ICT 4, 24.

Graesser, A.C., Forsyth, C.M., & **Foltz, P. W.** (2017). Assessing conversation quality, reasoning, and problem solving performance with computer agents. In B. Csapo, J. Funke, and A. Schleicher (Eds.), *On the nature of problem solving: A look behind PISA 2012 problem solving assessment* (pp. 275-297). Heidelberg, Germany: OECD Series.

Healy, A. F, **Jones, M.**, **Lalchandani, L.**, & Tack, L. A. (2017). Timing of quizzes during learning: Effects on motivation and retention. *Journal of Experimental Psychology: Applied, 23,* 128-137.

Hinojosa, Leighanna. *Citizen Science Identity: Becoming Citizen Scientists in a Museum-based Genetics of Taste Program* (first author) to be presented in a Roundtable discussion titled: *Navigating Affect and Constructing Identity in the Learning Sciences*.

WORLD CAFE on the ETHICS of GENETIC ENGINEERING

Earlier this year, over 200 high school students from Denver Public Schools participated in a World Cafe to discuss the ethics of gene editing technologies such as CRISPR (a genetic engineering tool that sequence of DNA and its associated protein to edit the base pairs of a gene) and their potential uses in medicine, human longevity, agriculture, and ecosystems management. The World Cafe is a "social technology" for engaging diverse people in deliberative dialogue about challenging or controversial topics. Students helped facilitate the World Cafe, and the participants were their peers, parents, teachers, and community members. The key ideas emerging from these lively debates were beautifully captured in a visual summary. The World Cafe was a culminating event in their final biology unit on Genetics and gave students an opportunity to showcase their knowledge and their ideas for future policies. It is also a way for students to integrate knowledge of science with the practice of civic dialogue.

With support from Inworks, ,an initiative of the University of Colorado Denver Anschutz Medical Campus for interdisciplinary innovation, the World Cafe was held at CU Denver and included a tour of the campus and the Inworks design and rapid-prototyping space. Researchers from CU's Anschutz Medical Center and volunteers from Denver BioLabs, the local biohacker community, contributed two short keynote presentations to set the stage for the debate and mingled with students at the round tables during the debate period.

The World Cafe approach was adapted and integrated into a new high school biology curriculum being co-developed by the Inquiry Hub, which is currently being tested by 3,000 students in Denver Public Schools. Inquiry Hub is a long-term Research + Practice partnership between researchers from ICS and the School of Education, and teachers and administrators from Denver Public Schools. This partnership has been conducting educational research, and developing new teaching and learning tools and curriculum since 2008. Other partners contributing to the high school biology curriculum include researchers from Northwestern University and BSCS (Biological Sciences Curriculum Study), a
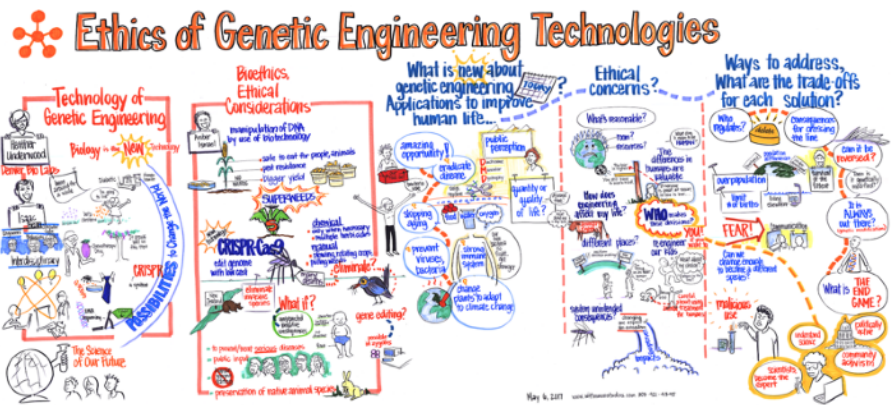
ICS CONTRIBUTES to ACADEMIC FUTURES

This fall semester kicked off one of the most comprehensive "visioning" exercises that CU has ever embarked upon. This process - designed to engage all faculty, staff and students - included surveys, town halls, visits to departments and other units, and a request for white papers all centered on the broad topic of Rethinking the University – the futures of learning and discovery.

ICS faculty and fellows collaborated with other Institutes and Departments across campus to co-author two white papers on topics important to our future research and training mission. Please take the time to read these papers and think about how we can work together to enact the goals and ideas they discuss!

INTERDISCIPLINARY GRADUATE EDUCATION (**Sumner**, **Caccamise**, and **Townsend**)

The authors outline six attributes of a model for an effective interdisciplinary model of graduate education.

CU REACH: Expanding Research and Education on Cannabinoids and Health (**Bidwell et al**)

The authors put forward a proposal to create a multi-disciplinary research center for studying the health effects of Cannabis in order to impact scientific understanding, public policy and public health issues related to the legalization of the drug in Colorado and across the nation.

ICS WORLDWIDE

ICS Fellow, **Rob Rupert** (PHIL), continues his European adventures. In October, he gave a keynote talk at Trends in Interdisciplinary Studies III: Social Cognition, in Lublin, Poland. In December, Rupert will give lectures at the Universities of Edinburgh and Stirling in Scotland (the latter one is part of his ongoing participation in a three-year project, Knowledge Beyond Natural Science, funded by the Templeton Foundation). And, in January, Rupert will be a guest presenter at Josef Perner's winter school in cognitive neuroscience in Salzburg.

ICS Research Professor, **Peter Foltz,** continued to serve as Content Lead for framework development for the OECD Programme for International Student Assessment (PISA) 2015 Collaborative Problem Solving Assessment and 2018 Reading Literacy Assessment, and new Literacy Assessment for developing countries. The results of the Collaborative Problem Solving Assessment were released this November.

Dr. **Marie Banich** gave a series of three talks in Padua, Italy and another talk in Verona, Italy this September. Banich presented "Inhibitory Control as a Critical Component of Executive Function? Conceptual Formulations and Neurobiological Mechanisms,""Implications of neural models for executive function for development and Psychopathology" and "The neural underpinnings of individual differences in executive functions as indexed by anatomical variation and resting-state brain organization." Additionally, Banich co-led a symposium entitled "Symposium 1: Control processes in working memory" and presenting a talk entitled "Clearing the contents of working memory" at the International Control Processes meeting in Amsterdam this October.

ICS Fellow Prof. Martha Palmer co-organized a workshop with researchers from the University of Florence, Italy on "Linking Data, Ontologies and Distributional Models for the Representation of Lexical Meaning". Professor Palmer opened the workshop with a far reaching talk on "Blocks World Redux: Merging the Generative Lexicon and VerbNet." The workshop brought together researchers from across Italy working on fundamental advances in natural language processing as well as those working on cutting edge applications. The closing talk was given by ICS Director Tamara Sumner who described how natural language processing techniques are being used to create new approaches to teacher professional development and training.

ICS PRESENTATIONS

Mike Mozer, Angela Yu, and Brenden Lake. (2017). *Cognitively Informed Artificial Intelligence: Lessons from Natural Intelligence*. Workshop: Neural Information Processing Systems (NIPS 2017) held in Long Beach, CA.

Schneider, V. I., **Healy, A. F**., **Carlson, K. W**., **Buck-Gengler, C. J**., & Barshi, I. (2017, November). *How much is remembered as a function of presentation modality*? Poster presented at the 58th Annual Meeting of the Psychonomic Society, Vancouver, British Columbia, Canada.

Tao, L., & **Healy, A. F.** (2017, November). *Function words in text processing*. Poster presented at the 58th Annual Meeting of the Psychonomic Society, Vancouver, British Columbia, Canada.

Young, A. P., **Healy, A. F**., **Jones, M.**, & **Curran, T.** (2017, November). *Facilitating voluntary self-testing through an automated question-generation educational application*. Poster presented at the 58th Annual Meeting of the Psychonomic Society, Vancouver, British Columbia, Canada.

Young, A. P., **Healy, A. F**., **Jones, M.**, & **Bourne, L. E., Jr.** (2017, May). *Different distributed practice effects when acquiring verbal and motor memories*. Poster presented at the 13th Context and Episodic Memory Symposium (CEMS), Philadelphia, PA.

Young, A. P., **Healy, A. F.**, **Jones, M.**, & **Bourne, L. E., Jr.** (2017, May). *Spacing benefits the acquisition of motoric but not verbal learning*. Poster presented at the 29th APS Annual Convention, Boston, MA.

Healy, A. F. (2017, October). *What cognitive psychology says about learning: 21 training principles*. Faculty Teaching Excellence Program, University of Colorado Boulder.

Kole, J.A., **Schneider, V. I.**, **Healy, A. F.**, & Barshi, I. (2017, November). *Training, retention, and transfer of data entry perceptual and motoric processes over long retention intervals*. Poster presented at the 58th Annual Meeting of the Psychonomic Society, Vancouver, British Columbia, Canada.

ICS Grant Award Activity

BANICH	Willcutt/Banich CLDRC Project III (Wilcutt, PI)	NIH
BIDWELL	Novel approaches to understanding the role of cannabinoids and inflammation in anxiety	NIH
	An observational study of the influence of edible cannabis and its constituent cannabinoids on pain, inflammation, and cognition	NIH
CACCAMISE Foltz & Littrell-Baez	Fostering Reading Comprehension and Knowledge-Building in Middle-School Students	IES
D'MELLO	A Theory and Data Driven Approach for Identifying Evidence of Collaborative Problem Solving Skills	IES-ETS
	Precision Education: The Virtual Learning Lab	Dept of Ed- Uni of FL
	Comprehensive Approach to Modeling Job Performance via Unobtrusive, Continuous, Multimodal Sensing	IARPA-Notre Dame
	Collaborative Research: Interpersonal Coordination and Coregulation during Collaborative Problem Solving	NSF
	A Big Biodata Approach to Mindsets, Learning Environments and College Success	Raikes-Stanford
	Measuring Character	Walton-UPenn
	Adaptive Learning Innovation Impact	INTEL
	Exploring adaptive cognitive and affective learning support for next-generation STEM learning games	IES
	EXP: Attention Award Cyberlearning to Detect and Combat Inattentiveness During Learning	NSF
	EXP: Collaborative Research: Cyber-enabled Teacher Discourse Analytics to Empower Teacher Learning	NSF
EISENBERG	Paper Mechatronics: Advancing Engineering Education Through Computationally-Enhanced Children's Papercrafts	NSF
	Collaborative Research: Debugging By Design: Developing a Toolset for Debugging with Electronic Textiles to Promote Computational and Engineering Thinking in High School	NSF
	Cyberlearning EXP: Catlyzing Scientific Inquiry and Engineering through Intesubjective Sensation Devices (Shapiro, PI)	NSF
MOZER	NSF-FO: COLLABORATIVE RESEARCH: Operationalizing Students' Textbook Annotations To Improve Comprehension and Long-Term Retention - Awarded an REU Supplement	NSF
MUNAKATA	Developing Inhibitory Control	NICHHD
SEDEY	Universal Newborn Hearing Screening	UCD
SUMNER Jacobs & Penuel	Collaborative Research: SchoolWide Labs: Using a School-Based Sensing Platform and Targeted Teacher Professional Development to Support Computational Thinking Integration and Promote Student Science Interest and Learning Outcomes	NSF
WAGER	Meta-Analysis and Machine Learning: Towards Neuromarkers of Craving and Relapse	NIDA-Yale
	Computational and brain predictors of emotion cue integration (Graber, PI)	NIH-Stanford
	Open-label Placebo Treatment for Back Pain	STE Foundation

NON GRANT FUNDS

SUMNER	Curriculum Co-Design for Heredity and Genetics & Summer Institute PD	Denver Public School
WAGER	Psychophysiologic Disorders Association Gift Fund	PPDA
VAN HORNE	Service Agreement Design & Lead Series of Science Formative Assessment Professional Developments in Collaboration with Oklahoma State Dept of Ed.	OSDE

ICS PhD GRADUATES

Brett D. Roads: Combined Ph.D. in Computer Science and Cognitive Science

Laura E. Michaelson: Combined Ph.D in Psychology & Neuroscience and Cognitive Science

CALL for COLLABORATORS

Are you an instructor who wants to improve your students' study skills? If so, consider participating in this Open Science investigation designed to teach students, through a brief online experience, that self-testing is a more effective study strategy than is restudying. Students often engage in study strategies that do not align with the recommendations of psychological research.

This investigation seeks to ameliorate this suboptimal study strategy problem through the use of a novel online intervention. In brief, students are exposed to the testing effect (the memory benefits of practice testing) online and are guided through the process of incorporating self-testing behaviors into their study routines.

We seek instructors who are enthused by the prospect of improving student study strategies to empirically validate its educational effectiveness in the Spring 2018 semester. Involvement on your end is minimal and would be incredibly helpful in validating this important educational tool. The deadline for getting involved is February 1st. For more information, please see the Open Science Foundation page at https://osf.io/6mdur/ or contact **Adam Young** at adam.p.young@colorado.edu.

LOST & FOUND

ICS has accumulated many water bottles and thermoses. If you have left a water bottle or thermos in any of the ICS conference rooms, please check in with the office, D414.

HUMAN SENSING SERIES

This year, based on suggestions from faculty, the Institute is going to try a little something new with the colloquia: themed talks. The basic idea is to plan a series of talks that look at the same topic from different perspectives, with the aim of enhancing our learning and professional development with an in depth look at a cutting edge area of research. To try out this new approach, our spring colloquia will feature three talks on Human Sensing that examine how innovative sensor technologies, data mining, and machine learning approaches can be combined to provide novel insights into human behavior and cognition "in the wild."

Please join ICS for its Colloquia Human Sensing Series.

Sidney D'Mello	**January 26th**
Mike Eisenberg	**February 16th**
Nate Rose	**March 9th**

All colloquia take place on Friday from 12:00 to 2:00 pm (unless otherwise noted) in Room D428 and D430 on the fourth floor of the Muenzinger Psychology Building. If you have questions, please call the ICS Office at 303-492-5063

EARLY-BIRD DONORS

ICS would like to thank the following October and November donors for their generous contributions to the Institute:

Ms. Abigail Studdiford

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