CABI NEWSLETTER

VOLUME 3, ISSUE 1

Georgia State University/Georgia Tech Center for Advanced Brain Imaging

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Featured Research

Researchers Identify Neural Signature of Tunnel Vision

"Many people have a feeling that we get lost in the story while watching a good movie and that the theater disappears around us," said Matt Bezdek, a Georgia Tech postdoctoral psychology researcher. "Now we have brain evidence to support the idea that people are figuratively transported into the narrative. "

Matt Bezdek, a Georgia Tech postdoctoral psychology researcher who led the study where the participants lay in an MRI machine and watched scenes from 10 suspenseful movies, including Hitchcock's "North by Northwest" and "The Man Who Knew Too Much," as well as "Alien" and "Misery." As the movies played in the center of the screen, a flashing checker board pattern appeared around the edges. The researchers discovered an ebb and flow of brain activity in the calcarine sulcus: the first brain area to receive and process most visual information.

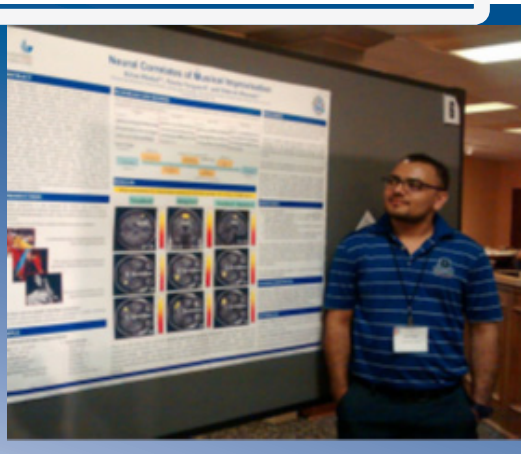
Essentially, when suspense is the greatest, our brains shift activity in the calcarine sulcus to increase processing of critical information and ignore the visual content that doesn't matter. "It's a neural signature of tunnel vision," said Eric Schumacher, Director of the Center for Advanced Brain Imaging and an Associate Professor in the School of Psychology. "During the most suspenseful moments, participants focused on the movie and subconsciously ignored the checker boards. The brain narrowed the participants' attention, steering them to the center of thescreen and into the story."

The checker board pattern was used because neurons in the calcarine sulcus are typically attracted to that type of movement. By presenting the checker boards at all times, the researchers tested the idea that suspense temporarily suppresses the neuron's usual response. The calcarine sulcus wasn't the only part of the brain sensitive to changes in suspense. The same was true for areas involved in higher-order visual areas involved in grouping objects together based on their color and how they're moving.

Recent News

Neural Correlates of Musical Improvisation

This study led by Mukesh Dhamala's and his team consisting of faculty collaborator Dr. Martin Norgaard and students Kirena Dhakal and Kristy Yun, examines the neural underpinnings in advanced jazz improvisers while they engage in covert improvisation.The brain activity during improvisation was higher and involving more regions than the pre-learned conditions, both in vocalization and imagine conditions. This suggests that musical improvisation is a complex creative behavior that may recruit a larger network of brain regions.



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SCIENTIST SPOTLIGHT

Dobromir(Doby)Rahnev, Ph.D.

Dr. Rahnev was recently hired as an Assistant Professor in the Geogia Tech School of Psychology. He received his PhD in 2007 from Columbia University, and completed post-doctoral training at UC Berkeley. His work is primarily in the field of perceptual decision-making. He is especially interested in the influence of the prefrontal cortex in modulating perceptual processes.

Sharee Light, Ph.D.

Dr. Light was recently hired as an Assistant Professor in the Psychology department at Georgia State. She received her PhD in 2013 from the University of Wisconsin-Madison. Her work is primarily in the field of affective neuroscience and clinical neuropsychology. She is especially interested in the influence of the prefrontal cortex in modulating emotional experience.Dr. Light uses fMRI,EEG and EMG Techniques.

Publications

Bezdek, M.A., Gerrig, R.J., Wenzel, W.G., Shin, J., Pirog Revill, K., & Schumacher, E.H. (2015). Neural evidence that suspense narrows attentional focus. Neuroscience, 303, 338-345.

Brewster, R., King, T.Z., Burns, T., Drossner, D., & Mahle, W.T. (2015). White matter integrity dissociates auditory attention span and verbal memory in emerging adults with congenital heart disease. Journal of the International Neuropsychological Society, 21, 22-33.

Fani, N., King, T.Z., Brewster, R., Srivastava, A., Stevens, J.S., Glover, E., Norrholm, S.D., Ressler, K.J., & Jovanic, T. (2015). Fear potentiated startle during extinction is associated with white matter microstructure and functional connectivity. Cortex, 64, 249-259.

Jayakar, R., King, T.Z., Morris, R., & Na, S. (2015). Hippocampal volume and auditory attention on a verbal memory task with adult survivors of pediatric brain tumor. Neuropsychology, 29(2), 303-319.

King, T.Z., Wang, L., Mao, H. (2015). White Matter Integrity Disruption in Normal Appearing White Matter: Correlates with long-term intellectual outcomes of childhood brain tumor survivors. PLoS One, 10(7): e0131744. journals.plos.org//plosone/article?id=10.1371/journal.pone.0131744

Highlights

"The Wiley Handbook on The Cognitive Neuroscience of Memory"

Professor Audrey Duarte has written a new book that will present a comprehensive overview of the latest, cutting edge neuroscience research being done relating to the study of human memory and cognition.

Upcoming Events

MR Technology Meetings (3:00pm - 4:00pm): 9/11, 10/2, 11/13, 12/4
New meeting to discuss acquisition and data analysis in detail

CABI Users Meetings (9:30am -10:30am) 9/17, 10/15, 11/19
Monthly meeting of CABI Users to discuss neuroimaging issues

Callosum Neuroscience Meetings (4:00pm -5:30pm) 10/6, 11/3, 12/1
New meeting and social for GSU and GT neuroscientists and students

Message From The Director

Over the past semester, I have met with many of our current and new users. I have heard from each of them what they liked about CABI and what they felt needed improvement. In response to this feedback, we have initiated many positive changes at CABI. First, we have initiated a call for proposals to fund new projects in neuroscience research and neurotechnology and analysis. Second, we are now offering analysis office hours and workshops to help current users with their MRI analysis issues. Third, we have taken a number of steps to build the neuroscience community around CABI. Our monthly "users meeting" will now be focused around a discussion of neuroimaging issues and papers. The new monthly MR Technology meeting will bring together Atlanta neuroscientists with interests and expertise in data acquisition and analysis. The new Callosum meeting and social will connect neuroscientists and students across the GSU, GT and the Atlanta community. Please see the CABI website (cabiatl.com) for more information about these and other initiatives. I hope these and our other efforts will improve both the quality and the quantity of the work produced at CABI.

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