November 29th, 2006

Dear Friends,

Thanksgiving has come and gone, and a winter chill is in the air again. Time to gear up for the holidays!

The summer and fall have made for exciting times here at the Aphasia Center, as we have several new faces around the lab. First and foremost, we’d like to welcome Carolyn Benjamin, our new chief of speech pathology. She is joining us from John Muir Medical Center in Concord, and has already been a tremendous help with her expertise in aphasiology, laryngectomy, and voice. Second, we would like to welcome our new post-doctorate researcher Analia Arevalo. She is joining us after completing her PhD program at UC San Diego and in Milan, Italy, and studies how the brain processes meaning in language. Last but not least, we would like to introduce our intern Patty Phaneuf. She has greatly enjoyed her clinical work in the CREC as well as her contributions to the research studies we have going on at our center.

We have recently finished the first stage of a new cognition and naming treatment study, with very promising results! We hope that the therapies currently being tested can be of future help to those with naming problems as a result of their aphasia.

In other news, congratulations to Sharon and Steve Willock for the birth of their baby boy Lukas! He was born on July 24th at 5:23 a.m., weighing in at 7 lbs. 15 oz. He is growing fast and we are eagerly looking forward to having Sharon back with us in January.

We hope to see you at our annual Holiday Party, which will be on Wednesday Dec. 20th, from 12:30-2:30. If we don’t see you there, we hope you have a wonderful holiday season and a Happy New Year!

Sincerely,
Nina Dronkers, Ph.D., Director
Center for Aphasia and Related Disorders
In this issue of our newsletter, we would like to update you on some current issues in neuroscience research. From experimental to rehabilitative studies, there is a lot of interesting work going on aimed at determining how brain processes influence behavior. In our last issue, we shared with you the methods of neuroscience. Now, we will share with you some of its recent fruits.

**Neurochip reroutes neural information in monkeys**

The re-routing of neural networks in the brain is considered to be a basic feature of learning. Recent findings by Andrew Jackson et al. at the Department of Physiology and Biophysics and Washington Primate Research Center show that a small implant can affect the flow of information between brain areas.

Researchers implanted a small electronic device implanted in the brain of a monkey that picked up neuron impulses from the motor cortex when the monkey moved its arm. These “spikes” of brain cell activity were then rerouted to an adjacent brain area by a microelectrode which stimulated the new area. The researchers found that after a 24-hour conditioning period, the artificially induced flow of information between the two areas altered the way the stimulated area controlled the monkey’s movements.

This method is still in its very early stages, but could eventually prove useful in rehabilitative therapies for people. For example, connections between brain areas that have been severed due to stroke or injury could potentially be restored. These findings were published in the Nov. 2006 issue of the journal Nature.

**Study of Language Use in Children Suggests Gender Influences How Brain Processes Words**

Boys and girls tend to use different parts of their brains to process some basic aspects of grammar, according to the first study of its kind, suggesting that sex is an important factor in the acquisition and use of language.

Michael Ullman and Joshua Hartshorne, two neuroscientists from Georgetown University Medi-

cal Center, discovered that boys and girls use different brain systems when they make mistakes like "Yesterday I holded the bunny". Girls mainly use a system that is for memorizing words and associations between them, whereas boys rely primarily on a system that governs the rules of language.

“Sex has been virtually ignored in studies of the learning, representation, processing and neural bases of language. This study shows that differences between males and females may be an important factor in these cognitive processes," said the lead author, Michael Ullman, PhD, professor of neuroscience, psychology, neurology and linguistics. One potential underlying reason for the findings is that the hormone estrogen affects brain processing.

**Why the Young Learn More Easily**

"Old dogs" may really find it hard to learn new tricks, a study of how memories form has suggested. University of Oxford scientists say that adults may find learning more difficult than children because their brains store memories differently. The study, in the journal Neuron, looked at nerve cell activity - the basis of learning and memory - in rats. Experts said younger brains may learn things more easily, but older brains may store information more efficiently.

The researchers, backed by the Medical Research Council and the Wellcome Trust looked at the nerve cell processes in young and old rats. Nerve cells communicate by sending signals though synapses, junctions between the cells. But some synapses are "silent" and are not activated when chemical signals are passed between cells.

The team used highly detailed laser imaging, which looked at images one micron wide - a 100th the width of a human hair, to look at how synapses behave. They focused on electrical activity and the movement of molecules called calcium ions. They found that silent synapses are more prevalent in young brains, and are called on when new memories are laid down. When this happens, key receptors - which detect stimuli - are called to the surface of the cell, transforming it into an active synapse. The re-
searchers observed that there were fewer silent synapses in the older brains, thus concluding that they have been “used up”.

**Myelin to Blame for Many Neuropsychiatric Disorders**

Conventional wisdom holds that myelin, the sheet of fat that coats a neuron's axon - a long fiber that conducts the neuron's electrical impulses - is akin to the wrapping around an electrical wire, protecting and fostering efficient signaling. The recent research of UCLA neurology professor George Bartzokis, M.D., has shown that myelin problems are implicated in diseases that afflict both young and old - from schizophrenia to Alzheimer's.

Now, in a report published in the journal Biological Psychiatry and available online, Bartzokis argues that the miles of myelin coating in our brain are the key "evolutionary change that defines our uniqueness as a species" and, further, may also be the cause of "our unique vulnerability to highly prevalent neuropsychiatric disorders." The paper argues that viewing the brain as a myelin-dependent "Internet" may be key to developing new and novel treatments against disease and aid in assessing the efficacy of currently available treatments, including the use of nicotine (delivered by a patch, not smoking), which may enhance the growth and maintenance of myelin.

**A Special Few Can "Taste" a Word Before They Can Say It**

Having a word stuck on the tip of the tongue is enough to activate an unusual condition in which some people perceive words as having different tastes, according to a new study. When people with the inherited condition, called synesthesia, looked at pictures of objects that come up infrequently in conversation, they perceived a taste before they could think of the word.

Some researchers believe synesthesia is an extreme version of what happens in everyone's mind. If so, the result suggests that all abstract thoughts are associated with specific perceptions, says neuropsychologist Julia Simner of the University of Edinburgh, co-author of the report. "The extent to which abstract thought is truly abstract--that's really what the question is."

Simner and her colleague Jamie Ward of University College London tested six synesthetes by showing them pictures of 96 uncommon objects such as a gazebo, sextant, catamaran, artichoke or castanets. Out of 550 trials in total, Simner and Ward induced 89 tip-of-the-tongue states. In 17 of these "um, um" moments, the synesthete reported perceiving a taste while still trying to conjure the word. In short, the word's meaning alone elicited the taste. To confirm that these reports were truthful, the researchers called the participants out of the blue a year later and retested them. The synesthetes consistently associated the same tastes with the same words, the researchers report in the November 22 Journal Nature.

**Stressed Mice Cast Doubt on Sleep's Ability to Produce New Neurons**

New results challenge the view that a good night's sleep can leave behind a dense bloom of brain cells in the morning. Prior studies had found that sleep-deprived rodents grow fewer new neurons than well-rested animals, suggesting that sleep somehow promotes the birth of brain cells, called neurogenesis. But that might not be the case: researchers called the participants out of the blue a year later and retested them. The synesthetes consistently associated the same tastes with the same words, the researchers report in the November 22 Journal Nature.

If you have questions about any of these research findings, please contact Fedor: 925-372-2000 ext. 5064, or fedor.v.petrenko@dartmouth.edu.
### Recommended Reading: Stroke Stories, Mindful Living, and Brain Mysteries

Many of these titles can be found at your local bookstore and online at Amazon.com

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<tr>
<th>Title</th>
<th>Summary</th>
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<tr>
<td>Merry-Go-Sorry: A Memoir of Joy and Sadness by Richard G. Cuddihy</td>
<td>Her sense of humor and beautiful prose are a true inspiration for more compassionate, peaceful living.</td>
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<td></td>
<td>This is the story of an internationally known environmental researcher who suffered a stroke with accompanying aphasia at 48 years old. In this autobiography, he gives a vivid and moving account of the stroke’s debilitating effects and his struggle towards recovery. Above all, Cuddihy provides a poignant tale of negotiating between acceptance of his disability and his determination to move forward, a challenge faced by many stroke survivors.</td>
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<td>A Stroke of Genius: Messages of Hope and Healing From A Thriving Stroke Survivor by Sandy Simon</td>
<td>The author, founder of the Stress Reduction Clinic at the University of Massachusetts Medical Center, is perhaps the best-known proponent of using meditation to help patients deal with illness. Kabat-Zinn focuses on mindfulness, a concept that involves living in the moment, paying attention, and simply “being” rather than “doing.” While you can practice anything “mindfully,” from taking a walk to cleaning your house, Kabat-Zinn presents several meditation techniques that focus the attention most clearly, whether it's on a simple phrase, your breathing, or various parts of your body.</td>
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<td>The Best of the Stroke Connection: A Collection of Personal Stories by Stroke Survivors and Caregivers by Pat Kasell</td>
<td>In this collection of personal stories by stroke survivors and caregivers, you will find stories that inspire and stimulate conversation. They are written by persons who had a stroke, witnessed a stroke, or cared for someone who had a stroke.</td>
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<td>A Man Without Words by Susan Schaller</td>
<td>This fascinating account of a deaf man who never learned to communicate with words or sign language. Above all, this book poses and explores the question, “What is it like to be without language?” and touches upon linguistic, philosophic, and educational ramifications of such a condition.</td>
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<td>The Places That Scare You by Pema Chodron</td>
<td>This neuroscientist has seen countless patients suffering from anosognosia, phantom limb pain, blindsight, and other brain disorders, and he brings a remarkable mixture of clinical intuition and research savvy to bear on their problems. An illustrated, captivating read, his book provides valuable insight into the brain’s structure and function and how the organ’s circuitry establishes a “self”. The writing is equal parts medical mystery, scientific adventure, and philosophical speculation—funny, lucid, and accessible.</td>
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Stroke Support Group
Annual Holiday Party!

When: Weds., December 20th, 12:30–2:30 p.m.

Where: Room E8A&B on 1st Floor of AB21 (tallest building at the VA)

What to bring: A dish or drink to share, if you are able, and a wrapped ornament to exchange

Questions: call Juliana (925) 372-4649
How many legs does the elephant have?

Can you count the black dots?

Do you see a face or an Eskimo?

Look at the chart and say the **COLOUR** not the word

**YELLOW**  **BLUE**  **ORANGE**
**BLACK**  **RED**  **GREEN**
**PURPLE**  **YELLOW**  **RED**
**ORANGE**  **GREEN**  **BLACK**
**BLUE**  **RED**  **PURPLE**
**GREEN**  **BLUE**  **ORANGE**

Your left brain is so accustomed to automatically reading a word that this reflex overrides or conflicts with the attempt to say the actual color!

Are the lines sloping or horizontal? Look closely...

Can you see two different animals here?

These illusions demonstrate that rather than perceiving things objectively, or “as they are” the brain uses certain organizational principles to make sense of what we see. For example, in the Face/Eskimo picture, the brain has a bias to organize the visual information into a Gestalt or “whole”, making it easier for most people to see the face than the Eskimo.
Season's Greetings!

VA NORTHERN CALIFORNIA HEALTH CARE SYSTEM
Contributors

Thanks to:
Nina Dronkers
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We would also like to thank the members of the Stroke Support Group and their families, the Speech Pathology staff, and the East Bay Institute for Research and Education.

Newsletter Information

If you would like to receive this newsletter or have comments/suggestions, call Juliana Baldo at (925) 372-4649 or email her at juliana@ebire.org, or write to:

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We welcome your comments and questions!

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