**Fast ForWord**  
(Continued from Page 2)  
and processing rate and sequencing—the cognitive skills essential for learning and reading success.

Individual success stories abound, such as a 10th grader who read at 1st grade level, assigned to remedial and special ed classes to no avail, until 3 weeks of training for 60 minutes a day with a personal coach and Fast ForWord software propelled him into the realm of “Reader” with a capital R. Today at 20, in college and on the road to becoming a teacher, he says, “I love reading now. Used to be, if you put a book in my hand, I’d say, ‘Take it back.’”

Now, a new TDLC research project is using archival Fast ForWord data, such as time series analysis and machine learning, to identify possible relationships between the timing of training sessions and changes in learning performance. The team, led by TDLC’s Eduardo Mercado, Assistant Professor and Director, Neural and Cognitive Plasticity Lab at University at Buffalo, SUNY, hopes that the project will contribute to the development of sophisticated techniques for adaptively controlling the timing and structure of training to meet the real-time needs and capabilities of individual learners.

Efforts to spread Fast ForWord information to teachers, parents and students in need include SLC’s Brain Fitness Seminars, Summits and Webinars. For more information, you can visit www.scilearn.com.

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**Brain Trivia**  
Which part of the brain is essential for the encoding of new declarative memories?  
a) Cerebellum  
b) Pons  
c) Broca’s Area  
d) Hippocampus

Look for the answer in the next newsletter, or log on to tdlc.ucsd.edu

Answer to last issue’s Trivia Question: B, Pons

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**ON Time**  
*Issue 02  February 2009*

**Where Have they Gone**  
Former TDLC Trainees Tackling New Opportunities

- **Heather Flowe**, Post-Doc/UCSD is now a Lecturer at University of Leicester, U.K.
- **Alex Foss**, BA/Yale, is now a Research Assistant at Children’s Hospital of Philadelphia.
- **Janet Hsiao**, Post-Doc/UCSD is now Assistant Professor, University of Hong Kong.
- **Eric Alvarez**, PhD/Yale, is a Research Assistant in Loren Frank’s lab at UCSD.
- **Christine Shin**, BA/Yale, is now a Research Assistant at Children’s Hospital of Philadelphia.
- **Alan Wong**, PhD/Vanderbilt, is now an Assistant Professor, Chinese University of Hong Kong.
- **Lingyun Zhang**, PhD/UCSD, is now a Scientist at ID Analytics, Inc. in San Diego.
- **Shantanu Jadhav**, PhD/Berkeley, is now a postdoctoral researcher in Loren Frank’s lab at UCSF.
- **Jonathan Nelson**, Post-Doc/UCSD is now a Research Scientist at Max Planck Institute, Germany.
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- **TDLC All Hands Meeting**  
  *February 20* & *21*  
  San Diego, CA

- **NSF Site Visit**  
  *June 10* & *11*  
  San Diego, CA

- **TDLC Trainee Bootcamp**  
  *August 10* – *22*  
  San Diego, CA

- **Brains ‘R Us II**  
  *Fall 2009 (Date: TBD)*  
  San Diego, CA

**Our Mission**

The Temporal Dynamics of Learning Center (TDLC) will develop a science of the temporal dynamics of learning that treats time as a crucial element in the learning process. We will integrate the study of learning dynamics across multiple time scales - from milliseconds, to life-long learning. This new science will inform educational practices and result in better learning outcomes.

**New ‘Educator’s Network’ Announced**

*Eyes, Mouth, or Nose?*

Quick, visualize the face of your favorite movie star?

Ok, what features come most readily to mind – eyes, mouth, or maybe even the nose? Vision scientists have long believed that the eyes play a bigger role in facial recognition than any other features.

But now it seems this may not be true for everyone, as a recent study by TDLC researchers Jim Tanaka and Robert Shultz has shown.

**Developing Face-like Expertise with Novel Objects**

For decades, scientists have debated whether faces are special because we have evolved a brain system dedicated to face recognition or become special through extensive practice recognizing faces. One way that faces are not recognized like most other objects is that we treat them more “holistically”. For example, we find it almost impossible to attend to only one part of a face and ignore the rest. Look at the face in the figure. Ignore the mouth. (Continued on Page 3)

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**TDLC Announces New ‘Educators Networks’**

Plans for development of The Educators Networks are in progress, according to the networks’ director, Doris Alvarez. The Purpose of The Educators Networks will be to work with TDLC scientists to translate findings from neuroscience research into the classroom. Alvarez indicates that there will be two levels of the Network: The Teacher Educator Network and the Educator Executive Network. The Teacher Educator Network will be made up of exemplary classroom teachers who will advise and provide information to TDLC scientists on areas that are ripe for research in the classroom. In the beginning, plans are to focus on mathematics instruction in light of the subsequent research resulted in interventions. These observations and interventions can be used to create interactive learning interventions. These observations and subsequent research resulted in formation of Scientific Learning Corporation and development of an...
Dr. Paula Tallal co-founded Scientific Learning Corp., and its reading intervention program, Fast ForWord

We asked Paula about the program’s early roots and future goals.

Dr. Tallal remains a Director of Scientific Learning Corporation, is a TDLC Executive Committee member and Co-Director of TDLC Education and Outreach, as well as Board of Governors Chair of Neuroscience and Co-Director of the Center for Molecular and Behavioral Neuroscience at Rutgers University. A world-recognized authority on “Fit Brains Learn Better.”

language-learning disabilities, she says, “I got interested in literacy by way of my long-term interest in language and the brain. My first experience was working with adult patients who had lost their language as a result of brain damage. I was absolutely horrified that you could lose the ability to communicate, to express yourself, or even understand what other people said.” Later in graduate school Dr. Tallal became interested in children with difficulty developing the ability to talk although otherwise developing normally and discovered through research a high incidence of these children also developing difficulty in reading, writing and spelling. At that point, she explains, she became interested in the entire continuum between oral and written language, what we could learn by studying children who are struggling. My particular interest was how the brain does it.”

Then, under the maxim “Fit Brains Learn Better,” Scientific Learning Corporation and Senior VP of Product Development William Jenkins brought in her expertise in learning-based brain plasticity, behavioral algorithms and internet technology. And so began development of a range of programs that build foundational reading and language skills by developing brain processing efficiency. They accomplish this through intensive, adaptive exercises that correlate both the word and the sound of letters and words and on to sentences and paragraphs. Fast ForWord supports existing classroom curricula in developing and strengthening memory, attention.

Let’s Face It! program.

discovered that children with autism spectrum disorder (ASD) perceive faces based on both eye and mouth features.

During testing children were shown two faces identical except for eyes or mouth. Typically developing children exhibited the usual eye bias and were more accurate in spotting differences in the eye area. Strikingly, children with ASD performed just as well in their ability to detect differences in the mouth area but not well in the eye area.

Searching for a reason for this apparent impairment in face processing, it seems plausible that if eyes seem socially threatening to individuals with ASD, they would look more at the lower, mouth region of the face.

Figure: Specific impairment of face processing abilities in children with autism spectrum disorder using the Let’s Face It! Skills Battery.

It is hoped that the group’s findings may provide valuable clues for developing effective interventions to enhance the face processing skills of these children, such as TDLC’s NSF-funded Let’s Face It! program.
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While working on the skills needed to learn to read, children who are struggling also develop the ability to understand the written word. Scientific Learning recently expanded their early intervention program Fast ForWord to include a reading intervention for children on the Autism Spectrum.

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Trainee Committee Awards

In response to a call for proposals announced in October, 2008, the TDLC training committee awarded $7,000 in small grants to support trainee research and collaboration. Below is a list of awardees and funded projects:

<table>
<thead>
<tr>
<th>Trainee</th>
<th>Institution</th>
<th>Project</th>
<th>PI</th>
<th>Sponsor</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olivia Cheung</td>
<td>Vanderbilt University</td>
<td>Overlap in processing mechanisms between faces and objects of expertise</td>
<td>Jean M. Vettel</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Brock Kirwan</td>
<td>UCSD</td>
<td>Cross-network collaboration to study the temporal and semantic factors of multimodal integration</td>
<td>Christopher Kanan</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Paula Kiefer</td>
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</tr>
<tr>
<td>David Peterson</td>
<td>UCSD</td>
<td>TDLC Director Gary Rutelius Awarded 2009 Paul F. Welder Medal</td>
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<td>-</td>
<td>-</td>
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</tbody>
</table>

Trainee Awards

The popular Brains ‘R’ Us II event has been rescheduled in order for organizers to develop a new, more interactive format for the event. We plan to establish BRU2 as a Fall event so that it will coincide with the beginning of the academic year. This will provide teachers and educators a better opportunity to immediately develop and apply in the classroom the brain-based learning concepts they take home from the event.

Let’s Face It!

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Fast ForWord

(Continued from Page 2)

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But now it seems this may not be true for everyone, as a recent study by TDLC re-
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(Continued on Page 3)

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For decades, scientists have debated whether faces are “special” be-
cause we have evolved to treat them more
familiarly. For example, we know faces are “special” be-
cause we recognize them holistically. For ex-
ample, we can recognize a face even when
some features are missing or altered.

One way that faces are
recognized is that we
notice or become special
features. For ex-
ample, we notice the
eyes play a bigger role in facial recognition than any other features.

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For more information, please contact Doris Alvarez
dalvarez1@cox.net.

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work and the Educator Executive Network. The Teacher Educator Net-
work will be made up of exemplary classroom teachers who will advise and
provide information to TDLC scientists on areas that are ripe for
research in the classroom. In the beginning, plans are to focus on
mathematics instruction in light of the difficulty many students have when
they commence the study of algebra. Two mathematics teachers have been
recruited thus far, Dr. David Weber from The Preuss School and Joan
Hanley from Mt. Carmel High School. In the ensuing months at least three
more math educators will be invited to
join the network.

Alvarez indicates she also hopes to recruit another group of educators to be
-called The Educators Executive Network who are well known in the
field of education and would provide advice and vision on a macro level.

These educators will be change
agents - superintendents, entrepren-
eurs in education, and reform minded
educational leaders, for example. Alvarez would welcome any sugges-
tions for names of individuals to make
up this group.

For further information about the
groups, please contact Doris Alvarez
dalvarez1@cox.net.

Fast ForWord: Not Just a Slogan

By Carolan Gladden

Some thirty years ago, TDLC’s Paula
Talal, along with other noted research
scientists Michael Merzenich, William
M. Jenkins and Steven Miller,
established several key findings and
began a collaboration that led in 1997
to creation of Fast ForWord. Among
other things, they observed that
cognitive and linguistic abilities could
be improved through intensive
intervention and that computers could
be used to create interactive learning
interventions. These observations and
subsequent research resulted in
formation of Scientific Learning
Corporation and development of an