

# BRAIN



## **BRAIN RESEARCH AND INSTRUCTION**

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I hope everyone had a wonderful summer and that your semester has started off well.

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### **HOT OFF THE PRESS!!**

A study just published in the Journal of Child Psychology and Psychiatry (vol. 48, issue 8 page 840-847, August 2007) has found that white noise can be beneficial when studying ---for those with Attention-Deficit-Hyperactivity-Disorder (ADHD). The consensus has been that noise is detrimental to cognitive tasks, but that some level of noise can actually benefit thinking. Based on the model that dopamine levels affect the level of noise that is necessary for the best thinking performance, researchers studied children with and without ADHD and different levels of noise on both verbal and memory tasks. The noise consisted of “white noise” which is similar to an air conditioner running or ocean waves or such. This background noise improved cognitive performance in those with ADHD while decreasing it in the control group. Researchers concluded that ADHD students needed more noise than controls. This is based on the phenomenon of stochastic resonance (SR) meaning that *moderate* noise can improve cognitive performance. Since it is based on dopamine levels, those with lower dopamine levels (ADHD) would perform better with more white noise compared to controls.

I might add a note of my own here: slowing a heart rate to normal (60-80 beats per minute) can improve cognitive performance. This can be done with certain music (think Mozart and most Baroque music). Since those with ADHD may have brain waves that operate at a different speed, it may be that the noise, which has an inherent tempo, may facilitate them, while impairing others. So unless you are working strictly with ADHD students, it is best to use music that we have recommend (see below). You can buy white noise machines, and you may want to suggest this to parents to put near where an ADHD child studies and let them see for themselves whether it helps or not.

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While we are on the subject of music, Dan Kern sent in some information about prepackaged music that is quite appropriate for the classroom. I like the selection from the Sound Health Series by Advanced Brain Technologies. You can find their selections by searching on Amazon for Sound Health Series. I also like *Music for Accelerated Learning* by Steve Halpern. There is a CD on Amazon called *Music for Thinking* featuring music by Beethoven. I go into the music stores and ask for functional music and buy prepackaged sets that I know will be at the right tempo so as not to overstimulate or create a dual task paradigm (with words, etc.).

## WORKING MEMORY IN STUDENTS WITH DYSLEXIA

In a study entitled *Working Memory Processing in Normal Subjects and Subjects with Dyslexia*, by Bowyer, S.M., Lajiness-O'Neill, R., et al, Using MEG imaging, researchers concluded that memory is processed differently in those with dyslexia compared to normal readers. Those with dyslexia had weaknesses in verbal, but not nonverbal working memory. Verbal working memory is more dominant in the left hemisphere and spatial memory is more dominant in the right. However, encoding and storage may be processed more in the left hemisphere. The researchers suggest that interventions should address auditory attention and working memory along with the traditional methods (most commonly consisting of addressing phonological deficits). Recall in some workshops that you took a spatial memory test. Dyslexics may perform better on tasks such as that. Can you capitalize on that when teaching? Can you put what you teach into spatial memory as opposed to verbal? Remember our human sentences and so forth?

Recall that in my research on the neuroanatomy of dyslexia, we found that dyslexics had 11% larger prefrontal lobes, particularly in the superior region where the dorsolateral prefrontal cortex is located, responsible for working memory. How all this fits together remains to be seen.

What is one way to improve working memory? Same as with other learning: practice. Meditation has been shown to improve memory and attention as well.

## FOOD FOR THOUGHT

A typical brain weights about 3 pounds. What percentage is that of your total body weight (Stop! We don't want to think about that!!! ☺). Yet, the brain consumes 20% of the energy. And where does it get that energy from? Your diet! Complex carbohydrates keep blood sugar stable and provide a steady stream of energy to your brain. High fructose corn syrup (check labels -in almost everything) can cause disruptions in blood sugar. You want slow burning carbs. Those come from brown rice, whole grains, and oats (buy steel cut and yes, it takes longer to cook – but you have fifteen minutes don't you?). Some fruits are better for this than others. Apples are ideal and keep blood sugar stable.

Speaking of oatmeal...oatmeal is high in zinc. Did you know that zinc levels are 30% lower in those with ADHD and that zinc levels have been shown to be more effective than some ADHD medications. But be careful, too much zinc is toxic. Why don't you check with your doctor or, better yet, a nutritionist, if you have a child with ADHD. Good sources of zinc are oatmeal, beans, nuts, lean meat and oysters. One great way to get children to get more zinc, is to make them a hot "oatmeal cookie" breakfast, as I think I have mentioned before. Add some peanut butter and a little chocolate to their hot oatmeal, and they won't be able to resist.

## Research Update

I am preparing a research protocol for Post Traumatic Stress Disorder (PTSD), using mindfulness meditation as an intervention with Vietnam Veterans with PTSD. Eventually, I will be looking at the relationship between stress and learning and ways to intervene. I am also becoming familiar with the role of meditation and improvement in cognition, attention, and memory. I will share this information with you as the research proceeds.

## BOOK OF THE SEMESTER

Do you have a book club at your school or in your department? It is a great experience when the faculty pick a book to read during the semester and, even informally, can share thoughts and insights throughout the semester. Here is a great one to pick: *Thinking About Teaching and Learning: Developing Habits of learning with First Year College and University Students* by Robert Leamson. This book was recommended to me by Gayle Nolan and it is so wonderful! I am on my second reading. I think high school teachers would find it worthwhile, as well. It is a short book and reads quickly, but is full of new insights and applications from brain research. There were moments when I said, "hey, did he go to *my* talk!" because I had thought some of my insights were original. I guess many of us studying the research are coming to the same conclusions, such as *experience first, then name it*.

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## LINKS – Bilingual Education

Check out <http://newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/1/hi/1> Being bilingual protects the brain.

In a study done at York University in Canada, researchers found that those who were fluent in more than one language were mentally sharper than those who spoke only one language. This study was published in the journal of Psychology and Aging.

*Thanks to Nora Fabela for sending in this information.*

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## WEB PAGE: [janetzadina.com](http://janetzadina.com)

I hate to tell you this, but the web page *still* hasn't been updated since Hurricane Katrina (two years ago as I write this) but...I have found a person here in Florida who can do that, so check the site once in a while and you should soon find it updated with new information.

## FROM THE FIELD

I love to hear from you. The following have given me permission to use their letters:

- > Janet
- >
- > I enjoyed the session and, as you suggested,
- > have passed on information about the brain to my students. Today, one
- > student told me he wants to get an MRI of his brain to see if he can
- > better understand his own learning/information processing difficulties!
- >
- > I look forward to learning more about brain research.
- >
- > --Cindy Hardy
- > Developmental English
- > University of Alaska Fairbanks

### FROM THE FIELD (CONTINUED)

Hi Cindy,

- > Thanks. You may want to mention to him that brain scans do not reveal
- > learning differences. Our research is across groups and we don't even
- > know what those differences mean and we speculate in very general
- > terms. You can't diagnose learning differences with a brain scan, only tumors or
- lesions.
- > Can we use this email in an upcoming newsletter so that we can remind
- > all the teachers about this fact?
- > Best
- > Janet

Hi Janet:

I was an attendee at the first workshop you gave at Cypress College. I got so much from that workshop and always learn from your newsletters.

I am teaching Career Technical Education now and my students are age 16 to adult. Many are young military wives due to our proximity to Camp Pendleton Marine Corp base. I teach Healthcare Essentials and Medical Insurance Billing. I was reading your newsletter before I prepared my orientation Power Point for the first day of my classes. I am unconventional in my approach to teaching, we do OK, and everyone learns. I like to talk about how we are all different learners from the beginning, about how we help each other learn, and about how students tend to gravitate into "work groups" in my class.

I had just read this from the Zurich conference in your newsletter:

*" ONE OF THE MOST INTERESTING PRESENTATIONS WAS A POSTER DESCRIBING SUBTYPES OF DYSLEXIA. GREEK SCIENTISTS MEASURED BRAIN WAVES AND FOUND THAT ONE SUBTYPE OF DYSLEXIA COULD BE DESCRIBED AS "BRAIN FATIGUE". THE READER WOULD GET TIRED VERY QUICKLY, AFTER A FEW MINUTES, AND HIS/HER BRAIN WOULD JUST SHUT DOWN. THIS IS THE STUDENT THAT WE MAY NOTICE IS NOT PAYING ATTENTION, DISTURBING OTHERS, FIDDLING AROUND, RESTING HIS HEAD ON THE DESK, ETC. WE THINK IT IS ATTITUDINAL, BUT IT MAY ACTUALLY BE, LIKE SO MANY OTHER THINGS, BRAIN WIRING. THIS PERSON CAN ONLY WORK IN VERY SHORT BURSTS. WHAT CAN WE DO ABOUT THIS? THAT IS UNCLER. I SUGGEST MEDITATION, SINCE STUDIES SHOW THAT IT INCREASES ATTENTION, RESTS THE BRAIN, AND INCREASES GRAY MATTER. IT ALSO MEANS THAT WE CAN HAVE MORE COMPASSION FOR THESE STUDENTS. WE WOULDN'T GET ANGRY WITH SOMEONE WHO COULDN'T KEEP UP PHYSICALLY, BUT WE OFTEN GET FRUSTRATED WITH SOMEONE WHOSE ATTENTION "CAN'T KEEP UP".*

First, I was amazed by that information. My gosh, I've had one of those students in every class I've taught. I thought they were rude.

So, I started out both of my orientation Power Points with the title of the class and the next three slides were pictures of brains with the statement, "We are all wired differently." I welcomed the students and started my talk by showing them each slide and saying, "We are all wired differently" When I came to the third slide I said, "Surely you know this brain?" (It was Homer Simpson's) and I said, "We are all wired differently."

### FROM THE FIELD (CONTINUED)

Then I told them that the reason I was starting out this way was because we are all wired differently and we all learn differently. Some learn by seeing, others by hearing, others by doing. I talked a little about how some learn fast and some slow, we don't criticize our classmate or brag, we appreciate the differences. I told the students that I had taken a workshop with a great brain researcher and read in her recent newsletter about the kind of student that after a short time in class puts his or her head down on the desks, fiddles around, etc., and that they are finding that this student's brain shuts down in a very short time. Would it be fair for me to yell at this student? Would it be fair for them to give this student a bad time? What if one of them is this student? I had 55 students in the classroom at the time. This really broke the ice. The next to the last slide in the orientation Power Point had one more slide with a very colorful brain that said, "We really are all wired differently."

*Kris Cerone, RHIT*

Kris Cerone, RHIT, CPHQ  
Instructor  
El Camino High School, Career Technical Education  
Oceanside Unified School District

### SOMETHING NEW FOR YOU!

As of January 1<sup>st</sup>, a workbook will be available based on my talk: *Six Weeks to a Brain Compatible Classroom*.

The workbook contains illustrations of the brain, information about the brain, a glossary of terms and web links. But the most important part, is the "workbook" section that reminds you of what has been taught and helps you think about it and implement it. The workbook can be used for professional development meetings as points of discussion, or by yourself to think through what you learned (and remind you of what you learned) in my presentation. This workbook will guide you toward implementing information from my presentations. Every "week" you will have options, so that you can select activities that fit in with *your* style, subject matter, and interests. Finally, some schools are using the workbook so that teachers can gain credits toward continuing education. I guide the administrator as to what pages they can collect as representation that the teacher has done X hours of work. The cost is only \$10, as wanted to keep it as low as possible. It will cost \$2.50 for shipping and handling, so the cost is \$12.50. If you wish to pre-order and get your copy as soon as it is ready, simply email me and I will send you the mailing address.

### WOULD YOU LIKE TO HAVE INPUT?

I know you have been discovering exciting ways to implement the principles and strategies in your classroom. Would you like me to include in the new workbook your ideas or even worksheets helping the reader puzzle it out (☺) ? If so, please send it in an email to me at [jzadina@uno.edu](mailto:jzadina@uno.edu). I would, of course, credit you and your school if you like.

*CONFERENCE SCHEDULE, FALL 2007*

Conference	Location	Dates	Presentation	Contact
On the Right Track 5 Symposium	Orange County, CA	October 1	Keynote: Using Brain Research to Enhance and Energize Instruction	Linda Slayton <a href="mailto:LSlayton@cde.ca.gov">LSlayton@cde.ca.gov</a>
Arkansas TESOL	Conway, AR	October 5	Keynote and Breakout: Using Brain Research to Enhance and Energize Language Instruction	Judith Hobson <a href="mailto:jhobson@sdale.org">jhobson@sdale.org</a>
FDEA: Florida Developmental Education Assoc. Conference	Orlando, FL	October 18	Keynote at Opening Session: Using Brain Research to Enhance and Energize Instruction with a focus on developmental education at the college level	<a href="http://www.valenciacc.edu/fdea">www.valenciacc.edu/fdea</a> or <a href="http://www.fdea.net">www.fdea.net</a> or 407.582.3219 or Erin Smith <a href="mailto:esmith81@valenciacc.edu">esmith81@valenciacc.edu</a>
National Indian Education Association	Honolulu, HI	October 29	Keynote: Using Brain Research to Enhance and Energize Language Instruction	VerlieAnn Malina-Wright <a href="mailto:vmalinawri@aol.com">vmalinawri@aol.com</a>
CRLA: College Reading and Learning Association	Portland, OR	Nov. 2	Session: Anxiety and the Brain: Hidden Triggers for Stress in the Classroom Also: Lunch with a Mentor	CRLA.net

In addition, I will be conducting workshops for school systems and colleges in various states for faculty. I will primarily be in CA, TX and FL the rest of this year.

## WORKSHOP TOPICS

### SOMETHING NEW FOR ESL PRE-SERVICE AND IN-SERVICE PROFESSIONAL DEVELOPMENT

CONTACT ME FOR INFORMATION ABOUT AN EXCITING MENU OF OPTIONS FOR PREPARING YOUR TEACHERS TO BE MORE EFFECTIVE IN THE INSTRUCTION OF STUDENTS FOR WHOM ENGLISH IS NOT THEIR FIRST LANGUAGE. INFORMATION ON THIS IS NOT INCLUDED BELOW. *CONTACT* [JZADINA@UNO.EDU](mailto:JZADINA@UNO.EDU)

*The following topics can be presented as keynote, concurrent session or half-day or all-day workshop:*

#### **Using Brain Research to Enhance and Energize Instruction**

This lively presentation, peppered with humor, music, and audience participation, engages and empowers educators by providing a foundation in research and theory on language learning in the brain and strategies for applying the research. Take a tour of a real brain via MRI brain scan and see how learning takes place in the brain through amazing visuals. See brain scans illustrating learning differences. Learn principles for instruction based on brain research and acquire strategies for addressing learning differences. Experience what it feels like to use alternative pathways in the brain. In addition, you will participate in activities that illustrate the principles and see how they can be applied. Participants will leave this session energized and excited about trying these new approaches to teaching and learning!

*Suitable for: all instructors*

#### **Using Brain Research to Enhance and Energize Language Instruction**

This lively presentation, peppered with humor, music, and audience participation, engages and empowers educators by providing a foundation in research and theory on language learning in the brain and strategies for applying the research. Take a tour of a real brain via MRI brain scan and see how learning takes place in the brain through amazing visuals. You will gain a basic understanding of language processes in the brain, including second language processes, which will give you insight into the difficulties language learners have. Learn principles for instruction based on brain research and acquire strategies for addressing second language *and* learning differences. Experience what it feels like to use alternative pathways in the brain. In addition, you will participate in activities that illustrate the principles and see how they can be applied. Participants will leave this session energized and excited about trying these new approaches to teaching and learning!

*Suitable for: all instructors who work with second-language learners*

### **Brain Research and Instruction: What Administrators Need to Know**

This lively presentation, peppered with humor, music, and audience participation, engages and empowers educators. Take a tour of a real brain via MRI brain scan and see how multiple pathways are involved in learning. Learn how knowledge is constructed in the brain with implications for classroom practices. Learn principles for instruction based on brain research and acquire strategies for addressing learning differences. Experience what it feels like to use alternative pathways in the brain. Learn how you can make your school more brain-compatible to enhance learning. Participants will leave this session energized and excited about trying these new approaches to leading, teaching, and learning!

*Suitable for principals, superintendents, curriculum developers, school board members, etc.*

### **Brain Research and Instruction: What Adjuncts Need to Know**

This lively presentation, peppered with humor, music, and audience participation, engages and empowers educators. Learn what brain research tells you about classroom management, emotion, and learning differences. Take a tour of a real brain via MRI brain scan and see how multiple pathways are involved in learning. Learn how knowledge is constructed in the brain with implications for classroom practices. Learn principles for instruction based on brain research and acquire strategies for addressing learning differences. Experience what it feels like to use alternative pathways in the brain. Participants will leave this session energized and excited about trying these new approaches to leading, teaching, and learning!

*Suitable for adjuncts and college faculty (often through the university Division of Teaching and Learning)*

### ***NEW TALK***

### **ANXIETY AND THE BRAIN: OVERCOMING HIDDEN STRESS TRIGGERS**

You know that high stress impedes learning. But do you know which subtle factors in the classroom increase stress? Learn hidden triggers and a strategy that improves attitude, behaviors, and stress. Topics include neuroanatomy of stress, priming, cognitive load, arousal, environmental factors, mirror neurons, modeling and Coping Self Efficacy theory.

*Suitable for any educator.*

*Length: 1 hour*

### ***Is It All In Their Head?***

### **How Brain Research Informs Our Understanding of Learning Differences**

A neuroscientist, former community college reading/English instructor, will bridge the gap between brain research and education, with a focus on how brain research helps us understand learning differences. Using Power Point illustrations of brain scans, this talk, presented in an entertaining and understandable manner, is designed to provide educators with tools for understanding brain research on learning and for understanding why and how students may differ in the way that they learn.

*Suitable for keynote or, combined with above talk, as a workshop, for anyone working with students, including tutoring center personnel, adjuncts, and counselors.*

### **Understanding Neural Processes of Reading and Dyslexia.**

(1 – 3 hours) Primarily for reading teachers and rather technical, this session explains how the brain reads, describes subtypes and theories of dyslexia, presents a neurobiological model of reading, and illustrates how individuals may vary in their processing of reading. This session does not provide specific classroom strategies. It is a background on research and theory.  
*Suitable for reading teachers.*

### **Keynote or session: Using Music to Enhance Learning.**

(1 hour) This lively presentation describes how music affects the brain and body, how musicians' brains are different, and discusses types of music and how they can be used effectively in the classroom. The overall purpose is to make sure that we are using music as the powerful *tool* that it is, and not use it carelessly in ways that might actually impede learning.  
*Suitable for all instructors, especially as a fun keynote or to have some variety in Featured Presentations.*

### **The Mystery of Attention: How the Brain Pays Attention**

Effective instruction begins with capturing students' attention. However, there is more to attention than you may realize. An educational neuroscientist shows how the brain pays attention with an amazing interactive experience. Learn about types of attention, the role of arousal and emotion, effect on retention, and strategies for enhancing attention.

### ***Announcing the Brain Research and Instruction Team!***

Many of you have requested a second-day workshop after having my full-day workshop in which teachers could explore the material in more specific, hands-on ways. Some of you have requested that I come back with a follow-up for this at another time. Due to my research demands and tight schedule, this has not generally been possible. Furthermore, my content expertise is primarily in the Language Arts field. Therefore, I have put together a team of teachers that can meet your needs in many ways, including:

- ❖ second-day or follow-up hands-on workshop
- ❖ total package conference, in which I present the keynote and my team and I present the breakouts - ideal for symposia or small conferences or professional development over the entire year
- ❖ options for Featured Presenters at a conference at which I am a keynoter so that the information can be broken down by content areas and the keynote followed up on in several ways
- ❖ for Professional Development for school systems to maintain and reinforce the learning from my workshop throughout the year or over a period of years

With one exception, each topic is an individual presenter, so you would include as many presenters as you wish to have topics and concurrent sessions. Sessions could then be repeated as necessary as well, in order to have small group participation and to address individual interests.

Contact me at [jzadina@uno.edu](mailto:jzadina@uno.edu) and [jzadina@msn.com](mailto:jzadina@msn.com) and I will send you information about the menu of options from the presentation team.

I would love to hear from you! Please drop me an email and share your successes! Due to the circumstances, it is best to use more than one of the following emails.

Until next time, I wish you a great semester!

**Janet Zadina, Ph.D.**  
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