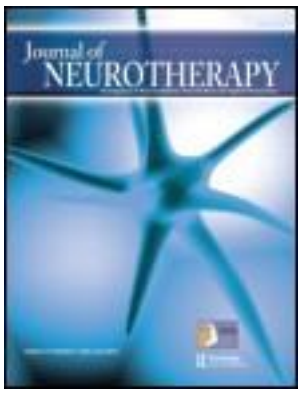

Journal of Neurotherapy: Investigations in Neuromodulation, Neurofeedback and Applied Neuroscience

News from Other Journals and Websites

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NEWS FROM OTHER JOURNALS AND WEBSITES

David A. Kaiser, PhD, Editor

Although the current roster of functional neuroimaging tools such as fMRI and PET can show where information processing occurs, they cannot describe how it occurs. For this, we need assessment tools with high temporal resolution. Fortunately, they already exist.

Authors are encouraged to submit recent reprints or preprints for review in this section and everyone is encouraged to submit reviews and website recommendations. Contact David Kaiser at dakaiser@skiltopo.com

RECENT MUST-READ PAPERS

Baumeister, A. A., & Hawkins, M. F. (2001). Incoherence of neuroimaging studies of attention deficit/hyperactivity disorder. *Clinical Neuropharmacology, 24*, 2-10.

Baumeister and Hawkins (2001) collate structural and functional neuroimaging studies of ADHD populations. Among others this includes five investigations into caudate nucleus size and morphology, six structural studies of the corpus callosum, nine functional studies of the frontal lobe, and seven of the temporal lobe. They conclude that not a single finding is consistently observed across this patient population. In fact, the power and promise of neuroimaging tools appear to undermine their current applications: researchers are drawing conclusions

they would be unlikely to make had less capable assessment tools been used.

Ironically, Baumeister and Hawkins are themselves not immune to this disease. Despite conclusions otherwise, many of the studies do appear to confirm each other. In structural imaging of the corpus callosum, for instance, the splenium is found to be smaller in ADHD patients compared to controls in half the studies. Studies of the genu, isthmus, and other corpus callosum sections show only a scattering of significant differences amid negative results, but of these eight differences (from 42 comparisons), all were in the same direction, smaller areas for ADHD patients relative to controls. Eight out of eight is convincing (and significant using a sign test). So despite all the noise inherent in a meta-analysis of six independent studies–from the diversity of subjects, the variations in diagnoses and comorbidities, not to mention differences in methodology–ADHD was often associated with smaller sections in the corpus callosum. A similar pattern is seen for the caudate nucleus: only 5 of 13 comparisons were significant, but all were smaller for ADHD. And the vast majority of functional frontal lobe findings were likewise in the same direction (i.e., lower compared to controls).

The authors are not blind to these patterns; they are simply underwhelmed by reports to date. Where is the compelling evidence for biological mechanisms of ADHD, they ask? Would non-biological hypotheses be allowed to thrive on such a nest of contradictory results? The authors call it "biologic tunnel vision"–neuroimaging tools obscuring non-biological contributions. Perhaps that is the take-home message from this thought-provoking paper.

Stern, E., & Silbersweig, D. A. (2001). Advances in functional neuroimaging methodology for the study of brain systems underlying human neuropsychological function and dysfunction. *Journal of Clinical and Experimental Neuropsychology*, *23*, 3-18.

Stern and Silbersweig (2001) review the strengths and weaknesses of functional neuroimaging, notably functional MRI, and the promising technique of integrating or co-registering such data with EEG or MEG (magnetoencephalography). Data reduction is a constant issue with neuroimaging, with fMRI being the current champ at devouring hard drives (single sessions can occasionally crest the one gigabyte mark). Although fMRI is non-invasive and provides superior spatial localization, it is also indirect: neuronal activity is presumed from changes in blood oxygenation. And although fMRI measurements may be recorded every 100 ms or so for limited areas, which theoretically allows

event-related fMRI, vascularization and oxygenation lags behind electrochemical activity by as much as eight seconds, making temporal correspondences problematic. So it seems that fMRI or positron emission tomography (PET) can provide the *where* but EEG or MEG must provide the *when*.

EEG AND NEUROIMAGING

Diego, M. A., Field, T., & Hernandez-Reif, M. (2001). CES-D depression scores are correlated with frontal EEG alpha asymmetry. *Depression and Anxiety*, *13*, 32-37.

Center for Epidemiological Studies Depression scale scores were negatively correlated with frontal EEG alpha asymmetry scores and positively correlated with left frontal EEG alpha power.

Kaiser, J., Perelmouter, J., Iversen, I. H., Neumann, N., Ghanayim, N., Hinterberger, T., Kubler, A., Kotchoubey, B., & Birbaumer, N. (2001). Self-initiation of EEG-based communication in paralyzed patients. *Clinical Neurophysiology*, *112*, 551-554.

Two paralyzed patients learned to regulate their slow cortical potentials in the absence of continuous feedback. This skill enables them to turn the communication device on and off without assistance.

Knott, V., Mahoney, C., Kennedy, S., & Evans, K. (2000). Pre-treatment EEG and its relationship to depression severity and paroxetine treatment outcome. *Pharmacopsychiatry*, *33*, 201-205.

In 70 patients EEG slow wave (theta) activities were positively correlated with depression ratings prior to treatment and post-treatment improvements were negatively related to delta and theta activity and positively related to frontal beta activity.

Pfurtscheller, G. (2001). Functional brain imaging based on ERD/ERS. *Vision Research*, *41*, 1257-1260.

The pioneer in the ERD paradigm reviews how spatial mapping of event-related desynchronization and synchronization may be used to study the dynamics of cortical activation patterns and he provides examples of each.

Pizzagalli, D., Pascual-Marqui, R. D., Nitschke, J. B., Oakes, T. R., Larson, C. L., Abercrombie, H. C., Schaefer, S. M., Koger, J. V., Benca,

R. M., & Davidson, R. J. (2001). Anterior cingulate activity as a predictor of degree of treatment response in major depression: Evidence from brain electrical tomography analysis. *American Journal of Psychiatry, 158*, 405-415.

Depressed patients who responded better to nortriptyline treatment showed hyperactivity (higher theta activity) in the rostral anterior cingulate (Brodmann's area 24/32) as measured by EEG tomography.

Posner, M. I., & DiGirolamo, G. J. (2000). Cognitive neuroscience: Origins and promise. *Psychological Bulletin, 126*, 873-889.

The authors trace critical developments in the fields of cognitive psychology, neuropsychology, and brain imaging related to the development of cognitive neuroscience.

Sutton, S. K., & Davidson, R. J. (2000). Prefrontal brain electrical asymmetry predicts the evaluation of affective stimuli. *Neuropsychologia, 38*, 1723-1733.

Frontal resting activity was associated with word-pair choice; those with relatively greater left-sided anterior activity predicted more pleasant pairs.

Yordanova, J., Kolev, V., & Polich, J. (2001). P300 and alpha event-related desynchronization (ERD). *Psychophysiology, 38*, 143-152.

Alpha ERDs may be specifically guided or modified by internal events indexed by P300.

MENTAL HEALTH AND NEUROLOGICAL DISORDERS

Committee on Children With Disabilities. American Academy of Pediatrics: Counseling families who choose complementary and alternative medicine for their child with chronic illness or disability. *Pediatrics, 107*, 598-601.

Use of complementary and alternative medicine is especially evident among children with autism and related disorders.

Kolk, A., Beilmann, A., Tomberg, T., Napa, A., & Talvik, T. (2001). Neurocognitive development of children with congenital unilateral brain lesion and epilepsy. *Brain Development, 23*, 88-96.

Children with congenital epilepsy have notable cognitive dysfunction, especially in language, visuo-perceptual and memory tasks, and

they have a high risk of developing attention, phonological, visuo-perceptual, and memory deficits

Lisanby, S. H., & Belmaker, R. H. (2000). Animal models of the mechanisms of action of repetitive transcranial magnetic stimulation (RTMS): Comparisons with electroconvulsive shock (ECS). *Depression and Anxiety, 12,* 178-187.

Repetitive transcranial magnetic stimulation (rTMS) can induce a seizure when given at high enough doses, but at subconvulsive levels it may act as an anticonvulsant.

Madhusudanan, M. (2000). First unprovoked seizure–to treat or not to treat? *Journal of the Association of Physicians India, 48,* 519-524.

Discusses whether treatment may be indicated even after a single seizure.

Shaw, K., Mitchell, G., & Hilton, D. (2000). Are stimulants addictive in children? What the evidence says. *Australian Family Physician, 29,* 1202-1204.

Despite the increasing use of stimulants in younger and younger children, few studies have examined this important issue, not enough to conclude stimulants are not addictive.

Speer, A. M., Kimbrell, T. A., Wassermann, E. M., D. Repella, J., Willis, M. W., Herscovitch, P., & Post, R. M. (2000). Opposite effects of high and low frequency rTMS on regional brain activity in depressed patients. *Biological Psychiatry, 48,* 1133-41.

As with neurofeedback, the effects of rTMS are frequency-dependent. In fact, opposite effects were found for high and low frequency rTMS on local and distant regional brain activity.

Willcutt, E. G., & Pennington, B. F. (2000). Psychiatric comorbidity in children and adolescents with reading disability. *Journal of Child Psychology and Psychiatry, 41,* 1039-1048.

Reading disability is not associated with symptoms of aggression, delinquency, oppositional defiant disorder, or conduct disorder, but it is associated with symptoms of anxiety and depression.

Willoughby, M. T., Curran, P. J., Costello, E. J., & Angold, A. (2000). Implications of early versus late onset of attention-deficit/hy-

peractivity disorder symptoms. *Journal of the American Academy for Children and Adolescent Psychiatry, 39*, 1512-1519.

Early onset of ADHD symptoms is associated with worse clinical outcomes with combined subtype of ADHD.

ONLINE RESOURCES

Recent media articles about neurofeedback:

Scientific American Frontiers (10 min video, Mar 27, 2001)
www.pbs.org/saf/1107/video/watchonline.htm

Time (Europe)
www.time.com/time/europe/webonly/europe/2000/09/stagefright.html

National Post (*Canada*)
www.nationalpost.com/search/story.html?f=/stories/20010405/523878.html

NPR's *The Infinite Mind (*"*The Electric Brain"*)
lcmedia.com/mind163.htm

Neurofeedback in the Media link repository
groups.yahoo.com/group/nfinthemedia

Chat transcripts:

ADHD: Brainwave Biofeedback for Focus and Concentration with Thomas Brod, M.D.
my.webmd.com/content/asset/chat_transcript.526881

"Treating ADD Naturally" with David F. Velkoff, M.D.
my.webmd.com/content/article/1707.50168

Neurotherapy domains:

Although many neurofeedback clinics and companies are already online, that doesn't mean all the good domain names are taken. Here is a small sample of available domains:

aboutneurofeedback.com	bestneurofeedback.com
familyneurofeedback.com	interactiveneurofeedback.com
myneurofeedback.com	neurofeedbackdirect.com
neurofeedbackinternational.com	neurofeedbackservices.com
neurofeedbacksolutions.com	neurofeedbackinformation.com
personalneurofeedback.com	quickneurofeedback.com

These domains are also available in .net and .org (e.g., aboutneurofeedback.net), and for terms eegbiofeedback, brainwave, and neurotherapy (e.g., aboutneurotherapy.com). Check networksolutions.com for current availability.

Generic terms (neurofeedback, neurotherapy) immediately inform the public about your work, but they don't always make the most memorable names. Yahoo and Google are two examples of popular internet brands with non-generic names. (Though it's arguable whether any term associated with neurotherapy is familiar enough to the public to be called "generic.") Adding one's locale–city, state, or country–to a generic term lets the public know your focus and location in one punch (e.g., newyorkneurofeedback.com, which is available). Or using a related term like "mind" or "brain" can give your site an interesting slant, such as optimalbrain.com and braincare.com (both taken).

There are three priorities to consider when choosing a domain name:

Priority #1: Do I like the name?

Priority #2: Will people remember it?

Priority #3: Will people be able to find my site?

A corollary to #3 is "Can I say the name over the phone (or in person) without spelling any part of it or having to repeat it multiple times?"

Priority #3 comes into play especially for hyphenated names and .net and .org domains. Prepare for people to misplace or forget the hyphen. Although neurotherapy-clinic.com is available, neurotherapyclinic.com is taken and some people will certainly look for you there. Likewise, if the all-important .com domain is taken (e.g., neurofeedback.com), shy away from the .org or .net domains (e.g., neurofeedback.org) unless you don't mind funneling traffic to someone else's site.

Domains cost $35 or less a year to register and can be hosted for as little as $7 a month. Altogether, not a high barrier of entry. But then again, creating interesting content that people will want to view and read–well, that costs a little more.