The Learning Enhancement Center

1705 14th Street, # 313, Boulder CO 80302

Phone: 303-449 1969, Fax: 303-449 0747

Crossinology's - Brain Integration Technique

Susan McCrossin, AP

The Brain Integration Technique for the Correction of Learning Difficulties

- for improving brain and body functioning

There are a number of muscle testing and acupressure techniques that can help reintegrate brain function at the electromagnetic, neurological and emotional levels. For those who have long-term, on- going loss of brain integration resulting from experiences traumatic enough to permanently shut down part, or most of the communication across their corpus callosum or who experience the massive brain confusion, more specific and direct interventions are required. Crossinology's Brain Integration Technique (BIT) for correction of learning difficulties can help address these imbalances. The following article addressing these issues is based on the research and experience of Susan McCrossin, B. App Sc[1].

Mental processing largely takes place outside of our consciousness in the various brain nuclei and palaeocortex of the limbic system. The brain, using it's hierarchical processing, determines how information is sent, stored or retrieved. With learning disorders some processes seem to go off-line. McCrossin surmised that the brain processes in a modular fashion. If one of these antecedent functions were compromised, all the processes dependent on this function will also show deficits. A way to unlock these processing sequences was needed.

Applied Physiology, a muscle testing protocol, interacts with on-line brain processing, and allows the integrity of brain functions to be directly assessed. Stress or dysfunction in mental processing can be easily detected by monitoring muscle response in conjunction with the activation of specific acupoints, either singularly or in combination. Whenever any factor disrupts coherent homeostatic muscle proprioception (feedback), a locked muscle may suddenly weaken or unlock, indicating that this factor is acting as a stress in the muscle feedback system. Thus, using specific muscle tests, whole configurations of brain functions such as the integration of visual processes, can be accurately discerned.

Applied Physiology techniques for brain physiology formatting, developed by Richard Utt of the International Institute of Applied Physiology, provided the guidelines for accessing the primary neurological processing modules using muscle response testing and acupressure. Utt showed that the readout of brain function seldom revealed itself in single active acupoints, but rather patterns of dysfunction in the brain would often only show up as a *pattern* of acupoint activity[2].

Once the pattern of acupoint activity detected by muscle response testing indicates stress then the factors causing that stress can be resolved by kinesiological and acupressure techniques. Thus, in the case of dysfunction in communication across the corpus callosum, as soon as the stress, or stresses that have caused the shutdown of functions are resolved, these processes so vital to learning will come back on line.

Using Neurological assessment techniques including Magnetic Resonance Imaging (MRI), it was revealed that learning problems not responding to the BIT treatment had underlying organic brain damage[3]. Brain damage can occur before, during or after birth from traumas such as a blow on the head, oxygen deprivation or seizures. As long as the affected areas are either small or in a non-critical center of function, the brain is able to compensate but may function in less efficient ways. If the damage occurs to a critical structure, like the left hippocampus, problems in the auditory or short-term memory processing may develop. In some brain damaged individuals these processing functions remained unchanged with the BIT treatment as evidenced by pre- and post testing of digit span, a standard measure of auditory and visual short-term memory. The digit span subtest of the Wechsler Adult Intelligence Scale-Revised (WAIS-R) involves the subject repeating a verbally presented sequence of random numbers. The span or number of digits that can be accurately reported varies with age, varying from 3 forwards and 0 backwards for a 4 year old to 6 forwards and 5 backwards for an average adult. Deficit digit span is when the subject recalls fewer digits than is average for their age.

Functional Shutdown

In cases not involving organic damage, hippocampal function can usually be restored via acupressure treatment. In several hundred cases psychometric post testing has shown a return to the normal range of auditory short-term memory function and even more importantly, the individual is then able to use this function to remember spelling words and retain multiplication tables[4]. For example, one 12 year old girl had a highly deficit digit span of only 3 digits forward and 2 digits backwards placing her in the first percentile of same age children for auditory short term memory. After applying hippocampal formatting techniques following brain integration she improved to the 50th percentile of same age children. Thus she had gone from practically no useful function to average ability for her age, which means she could now access enough short

term memory to learn spelling words, and for the first time in her life, recall multiplication tables. Likewise, she improved from the 25th percentile in innate reasoning capacity to the 99.8th percentile following treatment. She also went from the bottom of her class to the top of her class in academic performance.

Learning is a voluntary activity. Even if good brain integration has been established you may choose not to use it for a variety of personal and emotional reasons. Teenage boys can be some of our least satisfying clients because in many cases they are brought to us under protest. Even if these teenagers currently choose not to take advantage of their new state of integrated brain function, reintegration does give them one big advantage: they now genuinely have the ability to develop a function if they want to use it in the future. Before integration they had little chance of ever developing these functions.

For example, during a follow-up visit after completing the BIT with a 15-year-old, his mother reported that his spelling had shown no improvement. His ability to learn to spell words was checked and he easily demonstrated competency. He was then asked to spell some words he had learned as part of the program months before, again there was no problem. He had demonstrated his ability to learn to spell any word quite easily and to remember it, but that he was just choosing not to do so at this time and for his own reasons. The integration, however, was showing up elsewhere: he now had a 70% accuracy shooting baskets in basketball while before the treatment he had been only 20 to 30% accurate, an important change in function from his perspective.

An encouraging counterpoint to that case was the case of a 16 year-old boy who passionately loved reading and who was desperate to be able to spell well. He came for integration and in two weeks following the correction of his spelling functions he mastered 150 words that had always given him problems. At his next appointment, he brought in a list of the 50 most difficult words and asked to be tested on them. He got all but one right. Six months later, he had no spelling problems of any note and continued to be highly motivated to succeed in an area where he had previously experienced only failure.

EEG Patterns and Brain Integration

An EEG allows scientists to look at the patterns of electrical activity generated by the cortex when it is performing an activity. Traditional forms of EEG, using only three reference points, are inconsistent, showing a varying degree of correlation between the type of mental task and the areas of the cortex showing activity. How are researchers to distinguish if activity was due to the stimulus they were initiating, or some other brain activity, such as random thoughts?

A study was made by McCrossin with five learning disabled adults ranging in age from 18 to 45. Primarily, they reported reading comprehension and short-term memory problems. The

study concentrated on a new EEG method known as Steady State Visually Evoked Potential (SSVEP)[5]. In the SSVEP technique 64 electrodes are placed on the scalp, covering all processing areas of the cortex. In this way, specific areas of cortical activity can be identified, particularly against the constant stimulus of a flashing light. When the data from the electrodes is fed into a powerful computer, detailed maps of cortical activity can be constructed. While being SSVEP-scanned, if a person is asked to consciously do a particular cognitive task, he will automatically activate specific brain areas related to the performance of that task. In the area that is active, the SSVEP signal is reduced and the degree of reduction is proportional to the degree of activation of that area[6]. This allowed her to draw an activation map of the brain.

In a previous study comparing children with Attention Deficit Disorder (ADD) to normal subjects on two different mental tasks, the SSVEP patterns of these two groups showed significant differences. When normal subjects were doing a purely visual task, observing a computer monitor displaying numbers, their brain showed activity predominantly in the occipital lobes in the back of the brain, where visual image formation takes place. When they were then asked to anticipate, or pay attention to a particular signal, their cortical activity switched to the frontal lobes, the area of the brain involved in attentional and decision making tasks. In ADD children, the brain activity did not change. Activity remaining predominantly in the occipital lobes, even when they should have been paying attention[7]. Children with ADD or adults with learning problems often just watch their world and react to whatever happens with little anticipation of what might occur because they cannot activate the brain areas involved in 'paying attention' which is required for anticipating outcomes. Likewise, since prefrontal activity is also required for 'planned' decision making, and there is little prefrontal activity when people with ADD and learning problems make decisions, it would appear that these decisions must depend more on 'reaction' to stimuli than on planned actions based on considered decisions.

Along with these changes in cortical activity, after the BIT there was concomitant improvement in the adult subjects' digit span and reading comprehension. Before integration, the reading comprehension of the group had varied from 33% to zero, after BIT all had 100% comprehension. On the digit span test, all subjects changed from being marginal or borderline in their function to above average. Changes in both these mental functions are supported by the significant changes in cortical activity observed in the SSVEP results[8].

What is Intelligence?

Intelligence has been defined as being composed of two distinct aspects: 'fluid' and 'crystalline' intelligence[9]. Fluid intelligence is the capacity to perform abstract reasoning which involves 'native' intelligence and is thought to be unaffected by formal education. This includes the ability to solve puzzles, memorize a series of arbitrary items such as words or numbers, as well as the ability to change problem solving strategies easily and flexibly. Crystalline

intelligence, on the other hand, comprises the abilities that depend upon knowledge and experience or the amount of stored factual knowledge such as vocabulary and general information.

A number of standardized intelligence tests like the Wechsler Intelligence Scale for Children Revised (WISC-R) and Stanford Binet Intelligence Test, have been developed to measure various aspects of cognitive function. Regardless of whether these psychometric tests measure 'intelligence' or not, they do provide a standard assessment of performance in a variety of cognitively demanding tasks.

In a second study by McCrossin, three standardized tests of fluid intelligence were chosen to help measure intelligence: the WISC-R Block Design subtest, the Kaufmann Matrices and Inspection Time[10]. The subjects were also tested on short-term memory and reading comprehension. The WISC-R digit-span subtest was used as a measure of short-term memory, retrieval and distractibility. The Neale Analysis of Reading, a standardized test to assess reading comprehension, was also applied. Twenty children attending the Melbourne Applied Physiology clinic were chosen as subjects and ten children were randomly assigned to each of the treatment and control groups. All children were initially assessed on these five psychometric tests and then retested six to eight weeks later. In the intervening period the treatment group had the complete Brain Integration Technique protocol performed on them. The control group received no treatment but was retested at the end of the study.

Empirical observation and scientific validation of these tests show that fluid intelligence generally does not improve over time[11]. From this data it had been assumed that a person's past and future performance will be the same (allowing for growth, they will hold their relative position amongst their peers). This appears to hold true for children with learning disorders even when they have received extensive remediation.

The McCrossin study found statistically significant improvements in all of the tests of fluid intelligence between the pre- and post-tests for the treatment group[12]. No changes occurred in the performance of the control group. The BIT protocol was shown to be capable of changing the innate reasoning capacity of these children. It was also capable of affecting profound changes including the ability to develop and apply flexible strategies to solve problems.

The complex task of digit-span (short-term memory and attention) also showed significant improvements before and after treatment between the two groups. There was an increase in the average forward digit span from 4.8 (before treatment) to 6.2 (after treatment) and an increase in the backwards digit span from an average of 3.1 (before) to 5.5 (after). Since the average adult digit span is six forwards and five backwards these children had clearly improved from a deficit in this vital function to 'above normal' [13].

ADHD and BIT

A number of children initiating the BIT program have been classified as hyperactive and in recent years many of these children have been taking Ritalin to control their hyperactivity. When a child is going through the brain integration program of BIT, usually these children will calm down and maintain this state even after withdrawal from Ritalin. Parents often report that BIT has resolved their child's hyperactivity.

References:

1. Note: Susan McCrossin opened a Brain Integration center in the USA in 1998 called The Learning Enhancement Center, 3704 N. 26th Street, Boulder, Colorado 80304. Tel: 303 449 1969, Fax: 303 449 0747. Postal address: 1705 14th Street, #313, Boulder CO 80302, USA.

2. Utt, R.. *Applied Physiology Acupressure Formatting for Brain Physiology*, Applied Physiology Publishing. Tucson, AZ, 1991.

3. Jackson, G., Personal Communication. June 1990-July 1992.

4. Paphazy, J. Personal Communication. March 1989-July 1992.

5. Silberstein, R.B. et al., Topography and Dynamics of the Steady State Visually Evoked Potential: A window into brain function? *Brain topography*, 5:64-65. 1992.

6. Silberstein, R.B., et al. Steady-State Visually Evoked Potential Topography Associated with a Visual Vigilance Task. *Brain Topography*, 3: 337-347. 1990

Silberstein, R.B., et al., A Steady-state Visually Evoked Potential during the Wisconsin Card Sorting Test, *Electro-encephalography and Clinical Neurophysiology* (96): 24-35. 1995.

7. Farrow, M., Unpublished data. Swinburne Centre for Applied Neuroscience. Swinburne University, Melbourne, Australia. 1995.

8. McCrossin, S., Changes in SSVEP Topography, Digit Span Performance and Reading Comprehension in Response to Acupressure Treatment. Unpublished major research thesis, Swinburne University, Melbourne, Australia. October, 1995.

9. Cattell, R.B., "Theory of Fluid and Crystalline Intelligence: A Critical Experiment".

Journal Educational Psychology, 54: 1-22, 1963.

10. McCrossin, S., The Effect of Acupressure Treatment on Standard Intelligence Test Scores for Children with Learning Difficulties, Unpublished honors thesis. School of Biophysical Science and Electrical Engineering, Swinburne University, Melbourne, Australia. Nov, 1996.

11. Lezak, M.D., Neuropsychological Assessment, 3rd ed., Oxford University Press. 1995.

12. McCrossin, S., The Effect of Acupressure Treatment on Standard Intelligence Tests Scores for Children with Learning Difficulties, Unpublished honors thesis. School of Biophysical Science and Electrical Engineering, Swinburne University, Melbourne, Australia. Nov. 1996.

13. Ibid.