

Seeing inside the client’s mind

Increasingly, neuroscience is being emphasized as a source of foundational concepts for mental health counseling. In 2011, Allen Ivey and Carlos Zalaquett made the case that counselors affect the biological functioning of their clients’ brains, suggesting in many ways that counseling is neuroscience. The question now is how to bring neuroscientific principles into the world of mental health counseling. Furthermore, a need exists for clinical tools that directly employ neuroscientific methods to inform and enhance counselors’ abilities to assess and treat clients, as well as to track progress.

In this article, we describe a neurocounseling-based model that can provide an objective and scientific basis for mental health work that is both technically sound and humanistically relevant. This model, developed by the article’s authors over the past several years, integrates decades of work in diverse fields such as counseling, biomedical engineering, and assessment and training. It incorporates brain wave activity monitoring, is supported by empirical evidence, takes advantage of new technologies and has the potential to empower counselors and their clients.

The role of EEG

How can a neurocounseling-based model be brought into the mental health arena as an operational process? A key tool for our work is the electroencephalogram, or EEG. An EEG is recorded by placing sensors on an individual’s scalp and recording the electrical activity with sensitive amplifiers, usually in conjunction with a computer.

Although the EEG has been part of clinical neuroscience since its discovery in the 1930s, only recently has it found its way into the mental health field. One factor for that is cost. Until recently, an EEG system cost tens of thousands of dollars. Another factor is training. In the past, it was necessary to have a trained EEG “technician” available to connect the sensors and conduct the recordings.

Since the 1990s, however, the EEG has made its way into more environments, and with the development of two key areas, neurofeedback and quantitative EEG (QEEG), an increasing number of mental health professionals are using EEGs for various purposes. Neurofeedback is a form of biofeedback that uses brain waves for therapeutic training, while QEEG is a method by which an EEG is recorded in a standard office environment and computer analyzed to produce useful information, including brain “maps.”

A conceptual model for emotional responses and decision-making

The authors of this article, along with Seria J. Chatters, developed and published a neuroscience-based conceptual model for human emotional responses and decision-making earlier

this year. The model can be understood in the broad sense of interpersonal and social interaction, as well as dealing with brain circuits and their activity.

This model provides two key elements of value to the mental health counselor. The first is the ability to assess an individual’s resting state in terms of being more or less prone to either negative or positive emotional tone. According to this model, the frontal lobes of the brain can be seen to perform different emotional and decision-making functions. The left hemisphere is responsible for making decisions related to things that are deemed pleasant or safe, thus leading to approach-related thoughts and behavior. The right hemisphere is responsible for detecting things that are unpleasant or unsafe, and thus controls avoidance, withdrawal and “fight or flight” decisions. Any given individual may be predisposed in one hemisphere or the other, or may exhibit a balanced ability. A second aspect of the model is how individuals respond to experiences, which are regarded as “input” or “stimuli.”

The schematic representation of this model (see Figure 1) illustrates the parallel scanning capacity of the right hemisphere and the serial scan capacity of the left hemisphere, as well as their potential decisions.

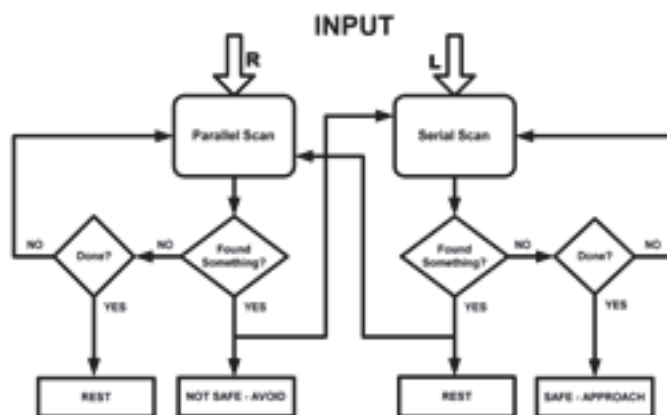


Figure 1

This model is based on more than 50 years of neuroscientific research demonstrating the differential functions of the left and right brain hemispheres, as well as the importance of the frontal lobes in regulating emotions and decision-making. Furthermore, on the basis of this research, particularly research in the field of affective neuroscience, it has been possible to identify the brain regions that are involved in specific emotional and decision-making functions. These include two areas of the frontal lobes, Brodmann areas 11 and 46, which are shown in Figure 2 (see following page).

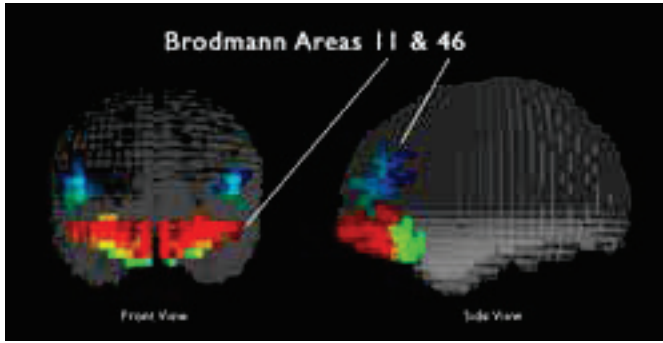


Figure 2

These displays are created by the EEG-based imaging system we are using (BrainAvatar). It is important to note that in these displays, the client is “looking out” from the page at you. Therefore, the right side of the brain is on the left side of the image and vice versa. In the images, the colors indicate brain activity in a continuous scale, with blue at the bottom (low level of activity) and color changes through green, yellow, orange and red indicating increasing amounts. In other words, areas in red are highly active, while those in blue are relatively inactive.

Sample application

One of the early observations made using this new model and instrumentation is shown in Figure 3. This client is a nationally recognized athletic trainer and has received awards for being an outstanding coach for Olympic athletes. She is also remarkably

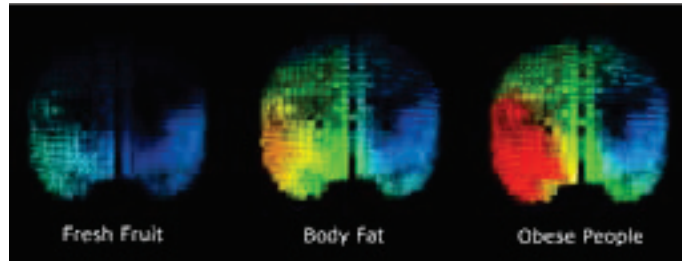


Figure 3

fit and is an example of discipline and success in the field. However, she is also typically rather depressed and does not describe herself as a generally happy person.

In the course of the assessment, she was presented with a series of relevant words. In her resting state, her EEG shows an asymmetry that consists of an abundance of right-hemisphere activity, correlating with a negative emotional tone. This asymmetry increased when she was presented with the phrase “body fat.” Her verbal report indicated that she thought that “people should not be fat.”

When presented with the more extreme phrase “obese people,” her response intensified significantly. Her initial verbal report was that she felt the same, that “people should not be obese.” However, the magnitude of this response prompted the clinician to probe further, asking “What else is there about obesity that you are not telling us?”

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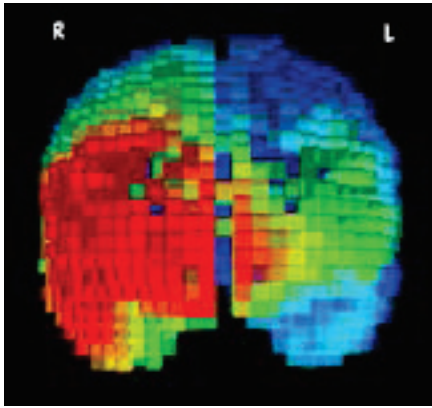


Figure 4a

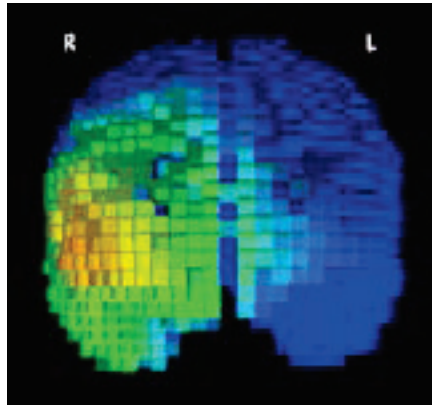


Figure 4b

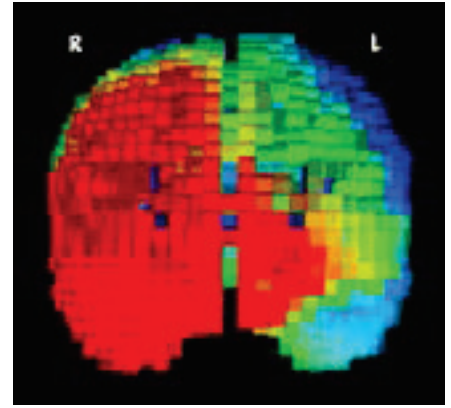


Figure 4c

The subject then became agitated, even angry. When the clinician persisted in this questioning, the subject finally broke out with a fist on the table and declared loudly, “When I was young I was obese, and I was teased and tormented over it. I swore I would never be obese again.” When asked how she achieved this, she revealed that she was anorexic and indulged in purging behavior. Thus, this method allowed the investigator to uncover a deeper emotional response that was being concealed and that was correlated with a maladaptive behavior pattern.

A second example is shown in figures 4a, 4b and 4c. The images depict a dominant right-hemisphere baseline status of a clinically depressed client during a wellness assessment (Figure 4a). Words and phrases were flashed on the screen, and standardized low-resolution electromagnetic tomography (sLORETA) gamma images were generated. These images, which are produced instantaneously (in real time), provide an accurate estimate of internal brain activity by using surface electrode measurements and advanced mathematical techniques. The reaction to the client’s favorite food, chocolate chip cookies, is still focused on the right hemisphere, although the intensity is reduced (Figure 4b). As a comparison, we see a major aversion to the word “beer” (Figure 4c).

What are the decisions and behavior that would be expected in light of these findings? The client might well buy a bag of chocolate chip cookies and eat them all, experiencing a degree of relief from the endogenous negative feelings that are present. On the other hand, the client would not feel entirely all right, so she might eat the entire bag and still not feel fine. Clearly, this would suggest an uphill climb in which the eating behavior reduces but

never totally relieves the underlying emotions that accompany the behavior. Thus, a counselor might be able to identify other options and find other means to improve the client’s mood without resorting to solutions based on dietary factors.

Closing comments

This approach can be empowering to both counselor and client because it allows for additional understanding — even empathy — for the client’s issues that can enhance, not detract from, the clinical interaction. I (Thomas Collura) have witnessed the relief and empowerment that can be instilled in clients when I explain that the dysfunction (dysregulation) that lies beneath their struggles has a biologic basis. Clients can understand that just as a weak knee tendon can produce pain and limping, for instance, weak or dysregulated brain function can produce an emotional or cognitive challenge. Furthermore, clients can observe the dysregulation and see how they might achieve change. Thus, clients who see the physical and biological basis of their challenges on a computer map can relate to and work with their issues with resolve and confidence. This can reduce or even eliminate any sense of hopelessness or powerlessness that would exist when such insights are blocked.

When this brain-based electrical approach is combined with counseling methods, new “microskills” emerge. Evidence-based and time-tested methods such as reframing, paraphrasing, challenging, reflecting, and even listening and attending can be understood in terms of this new framework. The counselor-client relationship and interactions now appear in the form of two brains, each responding and deciding each new step, based

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on a cyclic and evolving interaction. The client's brain now becomes an observable factor, not unlike a heart or muscle, that is preconscious and that underlies the feelings and decisions that become part of the interaction and growth of client and counselor.

How can this model be operationalized in the counseling environment? New hardware and software solutions are becoming available that are both affordable and powerful. These solutions have been applied in fields as diverse as the assessment of emotional distress and maladaptive behavior, optimal performance, forensics, pain management and neuromarketing.



Lori Russell-Chapin and Laura Jones serve as co-editors of the Neurocounseling: Bridging Brain and Behavior column. Contact them with comments, questions about neurocounseling or ideas for future columns at lar@fsmail.bradley.edu or Laura.Jones@unco.edu. ♦

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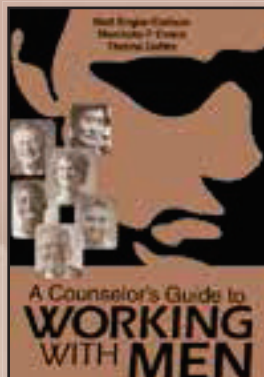
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