The Garden of the Heart:
HeartMath—The New Biotechnology For Treating Children with ADD/ADHD and Arrhythmia

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Eastern philosophy and the spiritual tradition of Sufism speak about the heart as a way of knowing. For centuries, Eastern philosophers, writers, and poets have described the heart as playing a central and vital role in all aspects of our life—not only physical, but also intellectual, emotional, and spiritual.

The Persian poets of the 14th and 16th centuries, such as Omar Khayam, Hafez, and Jalaledin Rumi, wrote that the soul and the spirit speak to the heart and that addressing the heart is thus key in the quest to "find one's self." Many of these influential poets meditated in the glorious Persian gardens. In their writings, the heart is often portrayed as a gateway to one's own "enlightened garden"—a seed of intelligence that enables us to advance intellectually, emotionally, and spiritually by connecting us to a higher aspect of ourselves.

Today, we have increased access to the benefits of advanced medical technologies and bioengineering. Yet of fundamental importance is the realization that we must somehow also address our unresolved emotional discordance in order to live life fully. Attending to the "matters of the heart" is essential not only for our physical health but also for our intellectual growth and for our social and emotional well-being.

The Institute of HeartMath is helping many people accomplish this goal by introducing a set of heart-based practices and tools that enable people to access the intelligence of their heart and to experience increased positive emotions and inner peace. Among practitioners in Mexico, HeartMath is referred to as *Medicina Biologica* ("biological medicine"). *Medicina Biologica* is inclusive of various forms of therapies for treating physiological disorders. Dr. Enrique Carlin, in his practices of *Medicina Biologica*, describes the interaction of consciousness, emotions and physiology in the form of a triangle.
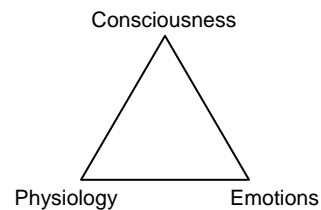
Thus, increasing our conscious awareness enables us to better manage our emotions and ultimately to bring balance and harmony to our physiological processes. In my experience, the HeartMath practices increase people's awareness, which in turn promotes positive emotional changes, which lead to the generation of healthy biological rhythms. This process is particularly evident in children we see in our clinic who are at first unable to self-generate positive emotional states. However, when these children apply the HeartMath tools, their emotional health significantly improves, as does their cognitive performance and behavior. Children with conduct disorders progressively gain self-mastery of their behavior through this therapeutic approach to integrating self-awareness and emotional self-regulation.

Since 1990, I have been actively involved in helping children heal through the arts. Specifically, I implemented Art Therapy in the school program for the Marin County, California school district from 1995 through 1998. Art was integrated in all the classrooms from kindergarten through 12th grade. The program was directed toward raising the self-esteem of children in the

schools. It also addressed different styles of learning—visual, auditory, kinesthetic, olfactory, and verbal. My co-educators and I also worked with the Autodesk Foundation, integrating biotechnology as part of their healing processes. Using body images, painting and photography, the children were able to improve their self-image and to increase their awareness.

Just as Art Therapy was a way of helping young people connect the mind and body through a nonverbal language, the HeartMath approach is helping children connect their hearts and minds using biofeedback technology to facilitate the process.

I had the opportunity to teach in Mexico through the international exchange teaching program that was offered through Sonoma State University. I worked in Guadalajara for a program sponsored by the University of Guadalajara. Here I introduced the same programs as I did in the Marin County schools with special *sobresalientes* (high-intelligence) children who also had attention-deficit disorder or attention-deficit hyperactivity disorder (ADD/ADHD). In 2001, I first used HeartMath's Freeze-Framer[*] to aid in teaching the HeartMath tools to these children.

Because of a great need, I later opened a clinic in Guadalajara to help treat children with attention-deficit disorder. At this clinic I was able to use the HeartMath tools and technology in treating many children with ADD/ADHD, ranging from 6 to 18 years in age. By using the Freeze-Framer heart rhythm coherence feedback system with them, I made a surprising discovery: the heart rhythm data indicated that the majority of these children were suffering from cardiac arrhythmia.

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[*] The Freeze-Framer is a heart rate variability feedback system that monitors heart rhythm patterns in real time and objectively quantifies a beneficial state known as psychophysiological coherence. The coherence level is fed back to the user as an accumulated score or success in playing one of three interactive games designed to reinforce emotion-refocusing skills. The system also includes a tutorial in the HeartMath positive emotion-based coherence-building techniques.

These findings were verified by a local cardiologist, Dr. Hector M. Briseño Ramirez, who has been working closely with me in my clinic. The discovery of cardiac arrhythmia in the majority of the children we see in my clinic was an extremely important finding, as it pointed to a clear psychophysiological factor that could contribute to the manifestation of the symptoms of ADD/ADHD.

When I started working with the HeartMath program, I used the following protocol. After every heart rhythm feedback training session, I set the child up to do the very effective exercises included in the Freeze-Framer program. I also introduced them to the Balloon Game, the Rainbow Game, and the Meadow Game. The responses were sometimes challenging because the children would have to work with their feelings and emotions, something they were not accustomed to; however, they quickly grew to feel that they had a safe place in which to practice the exercises without judgment. The children soon felt free to move the balloon or the rainbow or to color the meadow by just feeling or tapping into their emotions. Fear of judgment was not at issue, since the images they produced simply spoke to them about how they felt. It was especially empowering when they were able to complete one of the games successfully and then view their heart rhythm coherence scores, which showed a stable and highly coherent heart rhythm. Being able to create the images on the screen through their own emotional management skills and improving their heart rhythm coherence scores each time gave the children a sense of high self-esteem and generated feelings of self-empowerment.

In Guadalajara, since 2001, I have used the HeartMath technology in the successful treatment of 396 children with ADD/ADHD. I have evaluated the improvements in the children's ability to self-regulate their emotions by using these remarkable tools. I have found that the HeartMath tools and technologies correct cardiac arrhythmia, elevate children's self esteem, and bring about mastery in self-regulation. The improvements gained though the use of these interventions are so profound that they have eliminated the need for ADHD-related

medications in the vast majority of the children I have treated.

One example of the types of changes I have observed is illustrated by the following typical case of an 8-year-old boy. Similar to many of our cases, this boy struggled with conduct disorder and hyperactivity. This child also had an arrhythmia, as do many of the children we see. His mother had shared with us her disappointment and frustration with his stealing, lying, and passive-aggressive behavior as well as his diagnosis of ADHD.

After the ninth session of working with this child with the HeartMath tools and the Freeze-Framer, the boy's mother reported that there was no more lying or stealing and that her son had changed drastically. He was more sociable and more compassionate toward his parents and others. His academic scores had also significantly improved and he felt much more relaxed and secure about himself. One day, after his verbal therapy session in our clinic, the child came over to me and gave me a kiss to say thank you. I presumed this was for introducing HeartMath to him.

It is interesting to note that this boy's records indicated no biological basis for his symptoms of ADHD. However, our finding of his cardiac arrhythmia suggested that these irregularities in his heart rhythm may in fact have been an important physiological factor contributing to his ADHD symptoms.

To appreciate the significance of this, it is important to realize that ADHD is most commonly viewed as an environmentally-based condition that is not associated with any underlying biological disorder. This perspective, espoused by the American Psychiatric Association in its diagnostic criteria from *DSM-IV*, is maintained by many researchers and clinicians (Maté, 1999; St. Martin, 2004). My own research on one thousand cases, conducted from 1995 through 1998 in the Marin County schools, also supported this view. My overall findings were that the children enrolled in the Art Therapy program in these schools did *not* present biological disorders that could potentially be generative factors in their ADHD. Instead, the main causes appeared to be emotional factors related to issues such as family separation, loss of kin, divorce, and a chaotic lifestyle. My research also showed that these children responded to an intervention that integrated art/imagery and creativity into the main curriculum. This approach appeared to move the children toward a calmer state of consciousness. Indeed, it has become increasingly apparent that addressing the state of consciousness and emotion is a big part of healing children with a wide variety of psychosomatic disorders, including asthma, Reynaud's syndrome, tension headache, allergies, enuresis, neurodermatitis, obesity, and, as evident from my recent findings, arrhythmia. Thus, my work in Guadalajara propelled me to expand my previous view of ADD/ADHD as a disorder of primarily environmental origin. As I began to investigate physiological disorders in children with ADHD, it became clear that arrhythmia was a significant physiological factor in the majority of our cases here in Mexico.

Heart rhythm coherence feedback training addresses the regulation of the heart by both the sympathetic and parasympathetic branches of the autonomic nervous system. The heart's rhythmic activity continually reflects heart–brain interactions and autonomic nervous system dynamics. The HeartMath tools and technologies help to establish heart rhythm coherence as a familiar and accessible state, thereby changing the messages traveling between the heart and brain, stabilizing nervous system dynamics, and increasing emotional stability. Using HeartMath in treating children with ADD/ADHD became a golden key for us, yielding remarkable results across the physiological, emotional, and behavioral dimensions.

Figures 1 through 3 show the progress made by a 10-year-old boy with ADHD in learning to self-generate a coherent heart rhythm using the HeartMath tools and the Freeze-Framer system. The charts are actual records from the child's Freeze-Framer practice across 12 treatment sessions (several practice sessions on the Freeze-Framer are completed in each treatment session). The top chart on each panel plots the boy's average heart rate for

each Freeze-Framer practice session, while the bottom chart shows his heart rhythm coherence ratio (each vertical bar represents one Freeze-Framer practice session, with red representing the percentage of the session spent in low coherence, blue representing medium coherence, and green representing high coherence).

At entry level (treatment sessions 1 through 5, shown in Figure 1), this child demonstrated considerable variability in average heart rate across sequential Freeze-Framer practice sessions, with heart rate spiking extremely high in two of the sessions. In about half the Freeze-Framer practice sessions shown in this panel, the boy's heart rhythm remained in the "low coherence" range throughout nearly the entire session. However, in the other half of the sessions, the child was able to generate some medium coherence and even a small amount of high heart rhythm coherence.
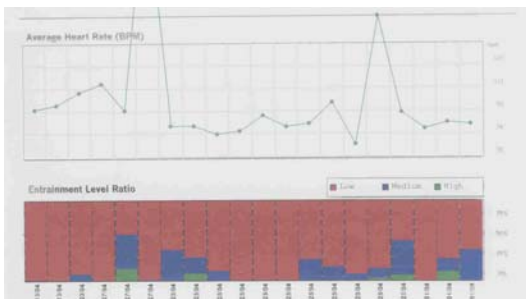

Figure 1. Sessions 1–5

Figure 2 (treatment sessions 6 through 9) shows a move towards increased coherence. Overall, the boy's average heart rate across the sessions has dropped considerably, although there is still one session in which he displays an extremely high heart rate. In about three-quarters of the sessions shown, he is now able to achieve between 25–75% medium to high coherence; and his ratio of high heart rhythm coherence (green segments) has also increased.

Figure 2. Sessions 6–9

Finally, in Figure 3 (treatment sessions 10 through 12) we see that this child's average heart rate has decreased even further and has become very stable from session to session (note that there are no extreme spikes in this record). His ability to generate medium to high heart rhythm coherence has increased substantially, indicating increased nervous system stabilization and increased synchronization and harmony in the activity of the heart, brain, and other bodily processes. Of particular note is the fact that this child had a cardiac arrhythmia at the beginning of the training program, which was no longer present at the end of the sessions; this was confirmed by cardiologist Dr. Hector Briseño.

Figure 3. Sessions 10–12

In sum, from our work in our biofeedback clinic in Guadalajara, Jalisco, Mexico, we have reached the conclusion that HeartMath's Freeze-Framer is one of the most promising biotechnologies of the new millennium for treating ADHD and many psychosomatic disorders.

For more information on the Institute of HeartMath, research publications, and the Freeze-Framer heart rhythm coherence feedback system, visit www.heartmath.org.

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