

# **OTHER FORMS OF BIOFEEDBACK**

## **Chapter Four**



## THE HEARTMATH PROGRAM

The following is quoted from the Freeze-Framer™ User's Manual:

"*The Freeze-Framer™* was developed based on research findings conducted by the Institute of HeartMath® under the direction of **Doc Childre, Ph.D., & Howard Martin, Ph.D.**, in Boulder Creek, California. It embodies the successful merging of the latest scientific findings on physiological balance. IHM's research indicates that a person's state of heart, or heart entrainment, is integrally linked with state of mind, emotions and physiology. Learning how to enter and maintain the heart entrainment mode results in coherence which uplifts the mind and body, and results in clearer thinking, improved problem solving skills, increased concentration, and an overall more peaceful outlook...."

" ... The Freeze-Framer monitors the beat-by-beat changes in your heart rate with its electronic sensor, which reads the pulse from your finger. It plots the speeding and slowing of the heart rate, and analyzes the heart rhythm pattern. In general, a smoother heart rhythm pattern indicates a more balanced nervous system and a more irregular, jagged pattern indicates a less balanced nervous system. The Freeze-Framer records the degree of smoothness or jaggedness of your heart rhythm and, based on a mathematical algorithm, assigns a score...."

"...IHM's research shows the experience of negative emotions leads to increased disorder in the heart's rhythms and in the autonomic nervous system, thereby affecting the rest of the body. In contrast, positive emotions created increased harmony and coherence in the heart's rhythms and improved balance in the nervous system. The health implications are clear: Disharmony in the nervous system leads to inefficiency and increased stress on the heart and other organs while harmonious rhythms are more efficient and appear to support the body's systems.

"More intriguing are the dramatic positive shifts that often occur in a person's perceptions when the heart experiences harmonious rhythms. When the heart rhythms are smooth and coherent, a person's perception of a difficult situation often changes into a more positive outlook...."

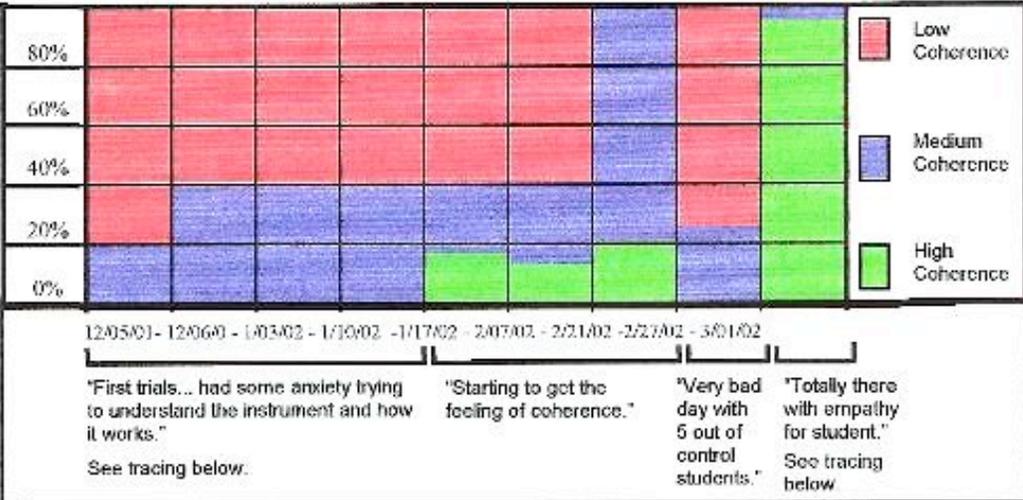
"... When people experienced and sustained sincere positive feelings like appreciation, the heart adopts a more coherent mode of function in its rhythmic beating patterns and can pull other biological systems into entrainment with it. In this state there is harmonious balance between the two branches of the autonomic nervous system and our physiological systems operate with increased efficiency ... "

*The answers I seek are all right here  
Whenever I keep my vision clear*

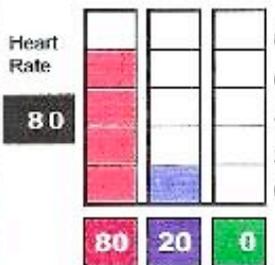
*Shelby W. Parker  
1995*

## HeartMath®

The Freeze-Framer™ monitors the beat-by-beat changes in your heart rate from an electronic sensor. The instrument plots the speeding and slowing of your heart rate, analyzes the heart rhythm pattern, records the degree of smoothness or jaggedness of your heart rhythm, and assigns a score based on a mathematical algorithm.



### FIRST SESSION Entrainment Ratio low - medium - high

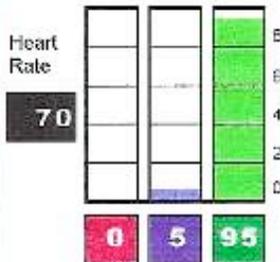


**Red** represents very low coherence. This is a heart rhythm that is irregular and out of balance. Negative emotions (anger, anxiety, fear) cause a disorder in the heart's rhythm. This directly affects the autonomic nervous system and thereby the rest of the body. The health implications are clear.

**Blue** represents medium coherence. It indicates that some harmony is beginning to take place in the heart rhythms, but that relaxation has not yet been completely established. As this happens, the blue begins to replace the red in the graph. A person can see and begin to feel calmer with less anxiety and more control over other emotions.

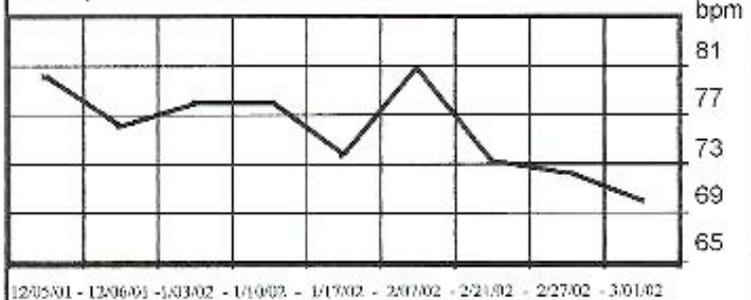
**Green** represents high coherence in the heart rhythm. It accompanies feelings of joy, empathy, peacefulness or meditation. These and other positive emotions create harmony and balance, and have a healthy effect on the whole autonomic system.

### LAST SESSION Entrainment Ratio low - medium - high

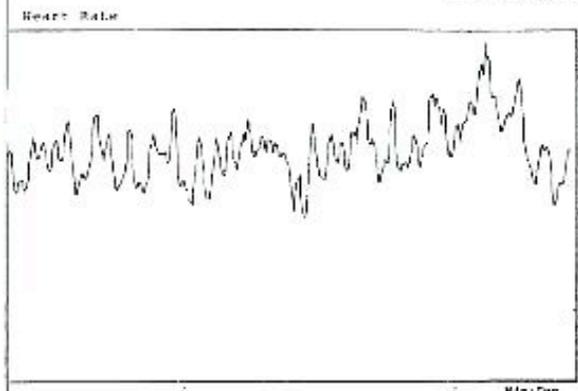


The records shown here were made by Mara Mayo, a school counselor at Pahoa High, HI. She keeps track of her own progress in learning to control the rate of coherence in her heart beat, along with the progress of her students.

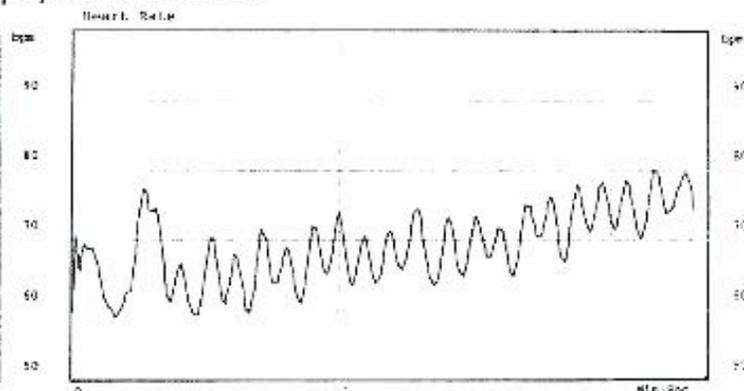
### Average Heart Rate (Beats Per Minute)



## Love helps, Hatred hurts.



First Session



Last Session

## LISTEN TO YOUR HEART TALK

By Mara Mayo

*Mara Mayo, M.F.M.C., C.S.A.C., began working as a high school therapist in 1994. She had used other biofeedback instruments before, but most of the students who were sent to her office, were initially too nervous or hostile to use them. However, as soon as she discovered the HeartMath program, she hoped that it would work for them. Most could relate to the idea that they might be able to control changes in their heart rhythms. The success of this program was more than she hoped. She retired from her job as high school therapist, to spend more time on her farm and her art. Her web site is: [www.maramayo.com](http://www.maramayo.com)*

The equipment for this study is called the Freeze-Framer™ program, and it is available through HeartMath, ® Inc. I used a Dell laptop with a sensor hook up that attaches to a finger. The sensor measures heart rate variability from the pulse. Data is collected and analyzed to create graphs and percent of relative coherence. The heart actually produces much higher amplitude of magnetic energy than the brain. This "field" influences the rest of the body in very profound ways. Because it is controlled by feelings and not so much by thought, the feedback is more relevant for working with students with specific learning disabilities, as well as those with severe emotional disturbances. We can bypass the linear thought, and go straight to feelings. It is possible that "Heart Intelligence" might have evolved before the logical brain.

Students who get "hooked up" initially get to see their pulse appear on the computer screen (which they all want to try). Then I switch them to a split screen that shows current heart rate variability, three bars that sort % coherence, and a graph of "the Zone." The first bar is red which represents low coherence (frustration, anger, intense attention). The second bar is blue which represents medium coherence (mild relaxation, meditation, possibly with alpha brainwaves). The third bar is green, which represents a high level of coherence (feelings of pure joy, gratitude, connectedness). Time trials are printed out and saved for future comparisons with past data. The program comes with the ability to graph progress as well as look at power spectrum information on each trial (reported in Hz).

According to 2000 census, Pahoia High and the Intermediate school is the most culturally diverse school in the USA. It is located on the Big Island of Hawaii in the Puna district. I work as a school based behavioral therapist, with a caseload of Dis-rhythmic Disorder, Conduct Disorder, Intermittent Explosive Disorder, ADHD, PTSD, ODD, and MR clients. Additionally, some are also poly-substance abusers.

The average reading level is 3rd-5th grade. Half of my caseload is in need of day treatment, but there is none available on this island. Students who come into my office have different communication styles as well as different understandings about what they hear. The local dialect is a "Pidgin English" that incorporates words from the Hawaiian, Japanese, Chinese, Filipino and Portuguese languages. The structure is similar to the original Hawaiian language with subject, object, verb order reversal and varying intonation. It is a heart-based culture, originally from an oral tradition with no written language. Traditional School has failed these children, as it does not address the challenges of the various learning styles. Combine that with postcolonial identity confusion and poverty, and this creates many situations of domestic abuse. Most of these kids come to me with the belief

that OTHERS make them mad! They have no concept or experience of emotional self-control. Most don't believe that it is possible!

The Freeze-Framer™ program allows them to experience their own heart in a different way. It gives them the opportunity to see that they do have control of their feelings, and how that ultimately affects their body. Sessions with this tool become part science lesson, part self-discovery and part therapy. I am always pleased with the results. Even if the students cannot relax at first, or even identify how they feel, a door has been opened for a new perspective.

Some successes include a 9th grader, who has had behavior problems historically since early grammar school. He is currently in a fully self-contained classroom. He started on the Freeze-Framer™ in November 2001. By February, he could take five deep breaths and become calm. In the classroom he has progressed from a reading level of 1.9 to nearly 3rd grade level in just months. Best of all, he is taking more responsibility for his behavior.

Another 10th grader who used to come in here and explain how, "so and so made me so mad, I had to hit him," now comes to me when he wants to see how "amped" he is so he can bring it down. He knows that it is up to him to control it!

For the most part, the fully self-contained classes use me as a way to de-escalate students who are out of control. I like to help them realize when they assign fault for their feelings to someone else, that they are giving their power away.

A 16 year-old girl, with serious past abuse issues, is now able to bring a little of the green color into the chart that shows increased coherence. With the green has come a flood of poetry writing, which is very intuitive and compassionate. I just entered her in the school's poetry contest. The grammar is not very correct, but the content is powerful!

Another success is a 17 year-old boy, who has had serious problems with peers and attendance. He has started coming to school everyday! He has found something that he can do well, and that gives him some positive recognition. Other students are now competing to see how well they can do at controlling their heart and mood. This form of self-discovery, through biofeedback, gives a measure of personal power back to the child. The benefits can be exponential. The benefits of learning some voluntary control before a crisis is demonstrated by the example below:

**A thirteen year-old girl had previously learned to establish some voluntary control over her heart rhythms. But one day she ingested some speed and an unknown substance. The teacher who sent her to my office described her behavior as "silly," and "off the wall." Her heart rate was wild and dangerous (chart 1 below left) with rates shifting between 59 bpm to 136 bpm (bpm = beats per minute) After two and a half hours, she was able to bring her heart rhythms back from the total chaos of extreme variability to a relatively calmer rate between 68 bpm to 110 bpm. The chart below right shows at least some improvement in her heart rate, but it was still not as good as the more coherent rhythm she had been able to do before mixing speed type drugs. She was able to do much better the next day.**

Chart 1 = Heart rate is 59 bpm to 136 bpm

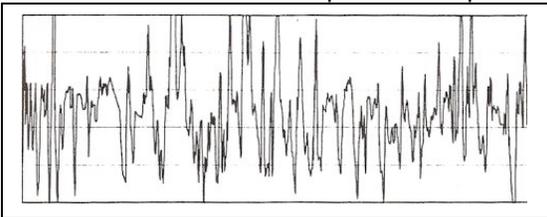
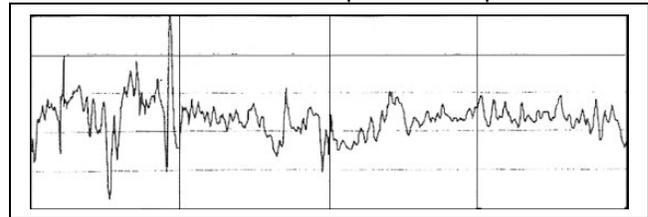


Chart 2 = Heart rate is 68 bpm to 110 bpm



**A PROJECT AT SAN SIMON SCHOOL**  
**By Phyllis Gagnier, Ph.D.**

*K. Phyllis M. Gagnier (Algonquin-Mohawk) received an MA in Human Development. Her PhD. studies are in Conflict Analysis and Resolution with an emphasis on Cross-Cultural Conflicts. She is an organizational licensed trainer, a consultant, and a certified organizational coach. She is associated with D'Coer: "From the Heart Training & Consulting" which is a Native American Indian owned business. She is an educator and an independent certified HeartMath trainer.*

This interview of Phyllis Gagnier was conducted by Jeff Goelitz, and was originally published in his column "*Feature Interviews*" Fall / Winter 2000) in the Quality Classroom Newsletter. Selections of it are re-printed here with her permission.

"From my earliest memory, I wanted to learn about culture -- my own and others. Very early on, I could see the different worlds especially between the reservation and the nonreservation cultures. I witnessed the stereotyping that happened between the cultures. I was always looking for a universal connector, something that would bridge the groups. That was and still is the heart. With our youth, I am bringing them to their own awareness of how they are seeing something. I have the kids discern where their perception is coming from: their head, their heart or some type of emotional reaction. The tools of HeartMath help with the process of owning the perception, re-framing the perception and transforming the original perception.

We have a project at San Simon School in southern Arizona. We started it in the village of Pisinemo, the Tohono O'odham Nation, with Sammy Fayuant, community developer and myself. At first we worked with the kids. Then parents and elders joined us ....

... With the youth we were focusing on their interactions with each other. When we worked with the parents and the elders we were concentrating on developing more trust between the children and the extended families of the community. There are many stories that demonstrate important little adjustments in the children's perceptions.

Jane Caskey of the gifted and talented program at San Simon School originally contacted me for assistance ... I suggested to Jane that we integrate HeartMath tools into our services because of the success we had in Pisinemo Village. I invited Sammy to join me and together we started working with the students in Jane's gifted and talented classes and with Jill Farrell's students in the special needs program ....

When we began using the heart tools, the prevalent perception of the kids was that everything was boring. My work is all about taking ownership for how we see things, shifting our perceptions, and self-managing our own behaviors in the face of at-risk situations like gangs, drugs, alcohol, labeling, etc. I feel kids need to become aware of and understand they have a choice in how they see their situations. I documented every perception of life the students expressed, which included labeling, violence, gangs, drugs, stupid and bored. I listed the HeartMath tool we learned that covered core values, Heart Lock-In, FreezeFrame, neutral, deep heart listening and appreciation. The science topics were emotional memory, heart electrical power, entrainment, stress cycle, anger, over-care, the three brains and the autonomic nervous system. I submitted the summary to each student (3rd through 8th

graders) and requested that they each check the perceptions, HeartMath tools and science they wanted to work on for the year. The responses were interesting. In 1997 the main theme was boredom. In 1999, the choices ranged from kindness, heart truths, care, focusing, leadership, play, giving, appreciation, peace, respect, music, gangs, drugs and feelings. Boredom was not checked by any student!

We are seeing changes in the student's interactions with each other and the adults in the room. Since the introduction of the Freeze-Framer, we have observed individual students self-managing their own responses and making an effort to help others.

At San Simon School, we would like to see a program that extends to all the classrooms. Several staff members from the Gila River Indian Community Residential Treatment Program for Youth have received HeartMath training. I am presently working on designing a pilot for integrating heart tools in both residential treatment centers and therapeutic dormitory situations. I plan to collaborate with agencies and school districts on the Goals 2000 School Reform Act sponsored by the Department of Education ....

-----  
Comments from students with Tohono O'odham Tribe:

**Jesse, age 13**

This HeartMath stuff is about learning more about your heart, how to get in it, and listen to what it is telling you because your mind can sometimes tell you bad things to do, like hurt people. The heart gives you good thoughts. I like the Freeze-Framer™ because I can see my heart rhythm. It will tell if you are getting into your heart or just in your mind. Sometimes, I practice getting in my heart when I'm in my room alone. I can be more relaxed alone.

**Johathan, age 11**

I like to shift to my heart when my friends make me mad. Shifting to my heart helps me get along better with my friends.

**Ashley, age 12**

HeartMath is special and fun. It gets you in your heart. Makes you do better in school and feel better for the rest of the day. It helps you focus and it helps me get along with friends. After I get out of the HeartMath class, I go to science and I feel better for the rest of the day.

**Kyle, age 12**

HeartMath helps me try harder in school. When I shift to my heart, I feel good.

**Gordon, age 12**

I show other kids how to do the Freeze-Framer™ so they learn how to get in the heart. Being in your heart relaxes you. It feels good. I like the Freeze-Framer™ best because it helps you get in your heart.

## **EXPLORING DIFFERENT WAYS OF THINKING -- HOW DO YOU THINK?**

**By M. King & J. Millay**

When we compare our individual dominant ways of thinking (i.e., visual, verbal, feeling, etc.), we learn that we all use these ways of “thinking” in different combinations. This exercise can be useful feedback for all of us. For example, a person who “thinks” mainly in images may be slow to laugh at word puns told by others who “think” mainly in words. (This is my problem, because first I have to convert my images into words to realize that the words have similar sounds, but have different meanings – images.) Below is a short class exercise the teacher can use to demonstrate the concept. Just ask the 1<sup>st</sup> question, but don’t read the answers given by previous students until they have come up with their own answers. Then go to the next question and repeat the format. At the end, ask the students to write a page or two to answer the question, “*How do I think?*” This could be a homework assignment for the following week, to give the student time enough to study his/her own processes seriously.

### **ON WAYS OF THINKING -- Goal: To discover personal memory systems.**

#### **1) Think of a number from one to ten, but don't say it, just think it.**

**Got it? How did you get it?**

"It just popped into my head."

"I heard it!"

"It was black and white, a block print."

"There was a strip of numbers from 1 to 10 running by and 8 was brighter than the rest."

"It was an orange 7 on the back of a green football jersey."

"It was a 9. A 9 is an important symbol for me, and I became the 9."

#### **2) How do you remember the alphabet?**

"I saw it. It was in one of those little trains like the ones that go around the top of the first grade room with those letters in each train car."

"It went up and down and it looked like that alphabet strip that my mom had stuck to the refrigerator when I was little."

"I remember by that dumb little song we learned in kindergarten."

#### **3) Think of a telephone number. How do you remember?**

"I saw it in my own handwriting by the telephone."

"I heard the whole number in a singsong kind of rhythm."

"I heard the first three numbers, but the last four I just knew by the way my finger goes to dial it."

"I remember because it starts with a 4 and  $4 = 2 \times 2$  and the next number is 6, which is  $4 + 2$  and then it's 7 which is three more than 4 and the last two numbers are 28, which  $4 \times 7$ , and the next to the last two are my mother's age when we went to Canada."

**ON CENTERING --- Goal: To increase focus of attention and  
To lengthen attention span.**

**4) Stretch, relax, breathe. How many times do you breathe in a minute?  
You count your breath and I'll count minutes.  
We'll be quiet for 10 minutes, just counting.**

"I lost count."

"I breathed 25 times in one minute."

"I had 14 breaths the first minute, 10 the last minute."

"Mine's down to 5 this morning."

"I had 42 breaths for 10 minutes."

"Too much going on inside my head, couldn't count today."

"Mine's up to 16. Now I remember, I had two cups of coffee with Dad this morning."

"I had a movie going on of how my Dad would act if he told Mrs. King about the plane crash he was in this weekend. I visualized the whole thing, but I could still step out of it to count the breaths."

**In Summary**

**What did you learn in science this year? (Reports from King's Final Exam)**

"I've learned a lot from this class. I've always hated science and only took it when I had to, but I heard some people talking about your class so I went and got enrolled. It was hard at first sitting still for five minutes. And dreams, well, I just didn't dream! But I learned different. I could remember my dreams and start to control who or what I dreamed about. The nightmares didn't come as often and dreams with meaning started coming at night. Soon the breathing wasn't forced and it was much slower, about 6 per minute. I could watch my thoughts and not get involved. Problems that were in my mind got solved easier, because I was not involved. This has been the best class I've ever been in. I wish I'd started earlier. I feel a lot better about my mind and body because I know more about it."

"I have learned about biofeedback, biorhythms, fish, plants, how the earth was formed and most important, about people and friendship."

"I'm understanding how to really have control over my being."

"I've learned a lot about bodily functions. How the heart, eyes, lungs, muscles and glands work. I really understand how they work. Not a textbook paragraph, which I can quote but a real understanding. I can now explain in my own words how they work in detail. I've also gained a lot of self-control and a better understanding of people. I've learned to improve my memory, how to relax, meditate, and I can identify all (practically) of my emotions."

"One of the things I think it did for me was to mellow me out. And from being mellow I have found it much easier to relate to people ... it has also helped me to cut down on using drugs. In the morning I meditate instead of smoking."

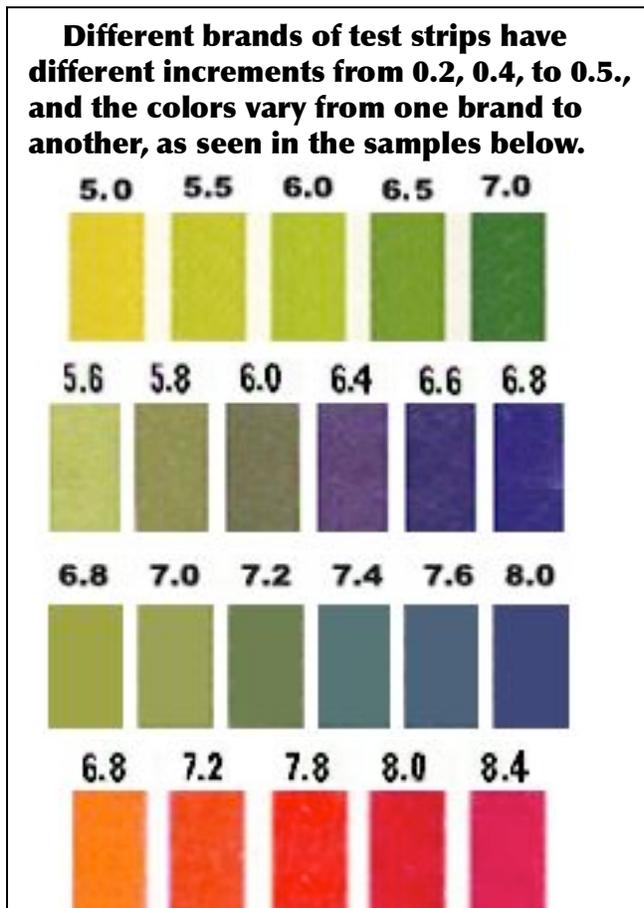
"I guess what it's really about is an awareness of yourself and the universe around us, an attunement with the heavens. Another goodie about meditation is that it lessens your limitations, you are able to do more and more with your mind and body. And after a while you will realize that you are only as limited as you want, or think you are, and that you can do anything you want to."

## BIOFEEDBACK OF THE BODY'S CHEMISTRY

There are self-testing devices that can analyze the amount of sugar in your blood, using only a small drop of blood. Too much sugar can cause problems and lead to Diabetes. Not enough sugar in the blood, and a person can become confused and weak. A serious deficiency can lead to a hypoglycemic comma. Some children in class are already diabetic, and they might volunteer to report on their own situation and the procedures they use to test their own blood, as recommended by their doctors. One magazine that brings the latest self-help news to subscribers is: [www.diabeteshealth.com](http://www.diabeteshealth.com)

If the body is too acidic or too alkaline, other health problems can occur. Some health food stores carry simple pH Test Strips that are usually inexpensive. A saliva test is one form of the test, though it reacts to whatever has been in the mouth most recently. While teachers may not want to have students go out to test their urine, that test may provide a more accurate response, because it can show what has been through the body. Anyway, it is probably best to test urine first thing in the morning, before breakfast, or before leaving home.

- 1) **Research project for the class** -- Make a list of vegetables, meat, candy and soft drinks that are considered to be either acid or alkaline, and post that on the wall.
  - A) Ask students to list what they eat in one day (or one week). They do not have to share this list. The list is for their own information so they can compare the list with the results of their test strips, just to see if there is a relationship.
  - B) Students who volunteer to participate may write a report on their findings.



### pH TESTING INSTRUCTIONS:

- 1) **From the roll of testing paper, tear off a 1" strip. Dip it in either saliva or urine. Compare the color with the examples on the box while it is still moist.**
- 2) **Numbers below 6.8 are acidic, and numbers above 7.2 are alkaline.**
- 3) **The 7.0 number is neutral, neither acid nor alkaline.**
- 4) **Variations are normal. However, if the strip always tests acidic, then it would be a good idea to eat more foods that are alkaline to stay balanced.**

## VIDEO FEEDBACK

When a video camera is used in the classroom, it can be a source of a lot of fun, as well as good feedback. The use of video for feedback requires that the operator use good judgment and considerable sensitivity in order to help students gain some measure of self-esteem. It is important that they do not feel that they are being made fun of. These days, most schools have audio-visual equipment, and many students already know how to use it for playing educational films. One method is for the teacher to set up the tripod and camera ahead of time in a far corner or in the back of the room. Warn the students, that no pictures will be taken of them if they insist upon looking directly at the camera. (The camera operator should ignore those who look at the camera deliberately and erase or back up the tape for re-recording someone else.)

First students need to gather into small self-selected discussion groups. For the next session, individual names will be chosen randomly from a box to decide the composition of the next set of discussion groups. These groups must be small enough so each one can be heard in turn to express an opinion. A polite ritual for handling disagreements should be introduced ahead of time, so when they occur, the monitor or teacher can mediate them. Expressions of anger are not acceptable.

When all groups are settled and understand the rules of conduct for this game, the teacher (or student, or visitor) will introduce an especially interesting topic for the class discussion to follow. Once all discussion groups are well under way, the teacher (or helper) will focus the camera on any group at random, and then focus on close-up images of the different people in the group while they are busy paying attention to their discussion. The camera-person should include some good images of all groups during the time allowed. If anyone was missed, s/he must be included during the next discussion session. When the time is over, the groups combine back into the whole class, and each group's chosen leader makes a short report about their discussion. If an important disagreement occurred, the leader of the opposition also makes a short report.

Next, the class needs to promise to be very quiet, and not comment on any images of any other student they might see in the video. Students could be asked to vote on the homework assignment (punishment) for anyone who chooses to make-fun-of, or insult, anyone else during this presentation. They might be barred from further participation. This project must not degenerate into teasing, insults, or name-calling.

Now the video can be shown to the class. Generally, students are pleased to see themselves on film talking intelligently about an interesting subject. The object here is to encourage active participation and improved self-esteem.

*Our freedom extends only as far  
as our consciousness reaches.  
Beyond that, we succumb to the  
unconscious influences of our environment.*

*--- C.G. Jung, 1955*

# ON HIGH SOCIO-ECONOMIC POPULATIONS IN JUNIOR HIGH SCHOOL

By V. Louise Crawley Sample, July, 1984

*Louise Sample, M.A., taught middle school for thirty years. She also has served as an instructor in the Graduate School of Education at John F. Kennedy University in Orinda, California. She has developed and presented seminars on such topics as biofeedback and stress reduction, brain compatible education, learning styles and modalities, multiple intelligences, cooperative learning self-esteem, and brain research. She was a board member of the Institute for Integrative Learning and Teaching, a developer and trainer for Project REACH, a consultant to school districts, and a trainer for the TRIBES program among others, as well as a co-author of "The Heroic Journey: A Rites of Passage for Adolescents." In addition, Louise has extensive training in NLP, hypnotherapy, personal growth, and the art of ritual.*

## Abstract

This pilot study investigated the effects of holistic educational techniques in junior high English classes. Five classes and two teachers were involved. Pre-post CTSS reading tests were administered to 141 students. Pre-post personal assessment questionnaires were administered to 162 students. The same curriculum was presented to all students. However, students in the control classes were taught in the traditional mode, using units and materials designed for specific ability levels. In the experimental classes, all students were given the materials designed for the gifted level, and holistic teaching methods were used to teach the materials. These included: cooperative learning, multi-modal and multi-intelligence processes, accelerated learning, and biofeedback for relaxation and stress reduction.

Statistically significant improvements of the experimental group over the control group were recorded in all areas tested in this study:

- (1) Vocabulary;
- (2) Reading comprehension;
- (3) Self-esteem;
- (4) Positive attitude increase.

On the CTBS, the experimental group showed a mean **gain of 15.3** months growth, as contrasted with a mean gain of **9.2** months growth for the control group (**P < .002**). The experimental group also demonstrated an average of **10% overall increase** in positive attitude/self-esteem responses above the control group.

This pilot study validated use of the holistic educational techniques, which increased learning, self-esteem and positive attitudes.

## **The Megacorporations as Educators of the Divine Child**

**"...Children are our ultimate investment.  
They are also the ultimate investment of**

**the nicotine pushers ...  
the alcohol conglomerate...  
the Pepsi generation...**

**"...The corporations are electronic  
child molesters..."\***

**"It is time to realize that the alienation of young  
people from their parents, from society, and from  
themselves is increasing despite the wealth of our  
country..."**

**"...Let us steal a bit of energy from our need to  
achieve and give it to our need for loving..."**

**----- Laura Huxley  
AHP Perspective Oct/Nov 2001**