

Manipulation of the Electromagnetic Spectrum via Fields  
Projected from Human Hands: A Qi Energy Connection?

RANDALL L. WAECHTER

*Department of Psychology\**

LAUREN SERGIO

*School of Kinesiology and Health Science\**

*\* York University, Toronto, Canada*

Keywords: Bioelectromagnetic, Electromagnetic, Energy, Hands, Qi

The concept of Qi energy has been an integral component of Eastern philosophy and medicine for thousands of years. While there is no precise Western definition of Qi energy, it is often referred to as bioelectricity. It has been well established in the West that the electrical activity in the human body produces magnetic fields, which are sometimes referred to as Bioelectromagnetic (BioEM) energy. Technological advances over the past several decades have made it possible to measure these subtle yet important electromagnetic energy fields within and around the human body. Increasing evidence suggests that the Eastern concept of Qi and the Western concept of BioEM energy may be one in the same. An exploratory experiment was designed and carried out with the intention of providing further evidence of this connection. Four adult males with reported extraordinary Qi energy manipulation abilities projected Qi energy towards copper coils

that were designed to measure subtle alterations in the immediate electromagnetic environment. The results indicate that power increased or decreased significantly in the test phase at several frequencies when compared to the control phases. The analysis also indicated that the change in power for these specific frequencies was directional. That is, these changes in power were mostly detected in one versus of all three of the coils simultaneously. These results suggest that it is possible for human beings to alter the electromagnetic environment around their hands at will. Specifically, the power seen at certain frequencies of the electromagnetic spectrum can be lowered or raised when a Qi Master "emits" Qi energy versus simply holding his hand over a detection device during a control phase

## **INTRODUCTION**

All electric currents generate magnetic fields, the rate of current flow through the electrical coil determining the strength of the field. (Washnis & Hricak, 1993). This phenomenon is known as the Hall effect, and is an accepted physical law describing the relationship between electricity and magnetism. The Hall effect states that a magnetic field oriented in a certain way to the flow of an electric current will divert the flow of charged particles to create a flow that is perpendicular to the original current. This effect works better for semi conducting currents, which have fewer particles and are more mobile than conducting currents.

Alternatively, when an electric current flows through a conductor, a magnetic field is produced around the wire, the strength of which is related to the amount of current flow (Oschman, 2000; Washnis and Hricak, 1993). It is also important to note that the magnetic

field produced by the flow of current through a conductor, whether physical or biological, is infinite. The fields, much like circles of sound waves that become larger as they move through space, become weaker as they travel, but theoretically never end. For instance, Dr. Harold Saxton Burr has measured what he calls 'L-fields', or the 'fields of life', with electrodes placed a short distance from the skin (Burr, 1972). All electrical currents then, including those arising from living organisms, are accompanied by magnetic fields that extend and interact throughout space.

Every living organism is born, lives, and dies in a sea of electromagnetic radiation, and all life has evolved in an environment consisting of electromagnetic energy. As a result, the interactions that take place between all living organisms and electromagnetic energy are both crucial to life and extremely complex. To deny interactions between electromagnetic fields and living things "would be to deny the fundamental reaction upon which every living thing on the planet depends, namely, the absorption of sunlight by green plants" (Oschman, 2000, p. 32).

Based on the connection between electricity and magnetism, scientists hypothesized that the electrical currents produced by the heart would also produce heart magnetism (Oschman, 2000). In 1963, Baule and McFee (1963) used a pair of two million-turn coils on the chest to pick up the magnetic activity produced by the heart. This was a major breakthrough concerning the relationship between living organisms and physical electromagnetic fields. The electrical activity that takes place in the human body produces magnetic fields, similar to the electrical activity that occurs in the physical environment. One of the philosophical debates that resulted from this discovery concerns "the boundary between the organism and the environment. In the past, we could define an individual as

that which lies within the skin; but it is a fact of physics that energy fields are unbounded” (Oschman, 2000, p.29).

Technological advances over the past several decades have made it possible to measure these subtle yet important electromagnetic energy fields within and around the human body (Oschman, 2000). Studies are now explaining the biophysical mechanisms that enable human beings, including therapists, health practitioners, and martial artists to sense and manipulate the BioEM energy fields produced by their bodies, and the implications of this manipulation (Beck, 1986; Oschman, 1993; Oschman, 2000; Russek & Schwartz, 1996).

The study of BioEM energy can teach us about the mechanisms of the smallest components of the human body as well as the properties that arise from the complex interaction between these parts. This interaction refers to the "property of wholeness, the integration that enables the parts to work together as a successful unit” (Oschman, 2000, p. 2). The concept of wholeness or oneness has been generally disregarded in Western medicine and scientific inquiry in the past, but is an integral component of Eastern medicine, philosophy and scientific thought. In the East, the oneness that is crucial to the process of life is referred to as Qi energy.

"For traditional Chinese medicine and philosophy, Qi is a physical reality. However, from a Western scientific point of view, the existence of Qi is an unproven, unclassified form of energy" (Eisenberg, 1995 p.47). Despite this widely held belief, Yang (1998) suggests that “although there is no precise Western definition of Qi, it is often referred to as bioelectricity. In fact...Qi is actually the bioelectricity circulating in all things” (p. 9).

According to traditional Chinese medicine, Qi is life, and the absence of Qi is death. To be truly alive and maximally healthy is to have Qi in every part of the body, and flowing through and beyond the body: “To die is to be a body without Qi. For health to be maintained, there must be a balance of Qi, neither too much nor too little” (Eisenberg, 1995, p. 43). The sources of Qi energy include nutritional Qi, Air Qi, and original Qi (Eisenberg, 1995).

Original Qi is that portion of Qi energy that is inherent to you, and was transmitted to you at conception from your parents. It cannot be replenished, and it is thought to slowly diminish in intensity over the course of our lives (Eisenberg, 1995). Original Qi is the basic pattern of your being, and as such, is critical to life (Gao, 1997). Upon death this form of Qi energy, like Nutritional and Air Qi, ceases to flow through the body.

In 1972 Harold Saxton Burr, an anatomist at the Yale School of medicine, proposed that human beings, and in fact, all forms of life, are ordered and controlled by electromagnetic fields, which he had measured and mapped with precision (Burr, 1972). These fields of life or L-fields as Burr called them:

Are invisible and intangible, and it is hard to visualize them, but a crude analogy may help to show what the fields of life...do and why they are so important: Most people who have taken high school science will remember that if iron filings are scattered on a card held over a magnet they will arrange themselves in the pattern of the ‘lines of force’ of the magnet’s field. And if the filings are thrown away and fresh ones scattered on the card, the new filings will assume the same pattern as the old. Something like

this – though infinitely more complicated –happens in the human body  
(Burr, 1972, p. 4).

In short, Burr believed that the electromagnetic fields produced by the body, what he called electrodynamic fields, are the basic blueprints for all living things and that the fields can be used to diagnose mental and physical conditions. This is very similar to the Chinese concept of Original Qi.

Chinese philosophy teaches that Qi energy is an integral part of the world around us, and can be projected externally from the human body. Recently many scientists in the west have gone from a conviction that "there is no such thing as energy fields in and around the human body to an absolute certainty that they exist" (Oschman, 1998; p. 27). Using sensitive magnetometers, scientists have measured the magnetic signature produced by the human heart from a distance of up to 15 feet in front of the body, resulting in a blurry distinction between an organism and its environment.

Simultaneously, the organs and tissues that compose the human body interact with the electromagnetic fields in the environment. For example, it is known that brainwaves can be entrained by a widely cited phenomenon called the Schumann Resonance (Becker, 1991; Burr, 1972; Thurnell-Read, 1995; Washnis & Hricak, 1993). This phenomenon was first described by W. O. Schumann (1952), a German atmospheric physicist. He hypothesized that the space between the earth and the ionosphere acts as a resonant cavity for lightning. The energy released by lightning strikes vibrates or resonates within the earth-ionosphere cavity in the extremely low frequency (ELF) range (1-40 Hz.), with an average frequency of 7-10 Hz. (Oschman, 2000).

The average Schumann frequency is similar to one of the four frequencies, or stages of electromagnetic activity recorded in the brain. Together, these four stages of brainwave activity are intimately linked with stages of consciousness in human beings, from delta, to theta, then alpha, and finally, beta. The range of resonate activity of the brain, through all of these stages, is about 1-50 Hz., with relatively little activity seen above 45 Hz. (Oschman, 2000). As such, it can be argued that the bioelectromagnetic activity seen in the human brain resonates within a range that closely corresponds to the range of electromagnetic pulsations of the Schumann Resonance, at 1-40 Hz.

Brain waves are not constant in frequency, but vary from moment to moment. The brain's pacemaker determines the frequency of the brain waves at any given time, which is anatomically located in the thalamus (Andersen & Andersson, 1968). As a result of physiological constraints with the movement of calcium ions across the membrane of a neuron, these pace-making thalamocortical neurons experience a silent phase every 1.5 to 28 seconds. During these thalamocortical silent phases, which can last from 5 to 25 seconds, the brainwaves are said to be in a free run period, and are susceptible to entrainment with outside fields. It is during these free run periods that the Schumann Resonance may entrain with human brainwaves. With the coming of night the ionosphere moves higher, and the frequency of the Schumann Resonance falls to the low range of the spectrum (1 to 7 Hz.) These frequencies entrain through the pineal gland and overall brainwave activity during the free run period, resetting brainwave activity to between 1 and 7 Hz, which corresponds to the delta and theta stages of brainwave activity. These stages are associated with light and deep sleep and other stages of altered consciousness in

humans. In this way, human behaviour may be influenced by entrainment or absorption of electromagnetic fields in the environment.

Qi Gong masters have the ability not only to absorb Qi from the environment, but also to manipulate Qi energy at will. This manipulation involves the projection of Qi energy beyond the boundaries of their bodies, a feat known as external Qi projection. The Chinese believe that external Qi is merely the extension of one's internal Qi. This projection of external Qi can influence other living things as well as inanimate objects (Eisenberg 1995, Dillman & Thomas, 1992). For instance, Eisenberg (1995) discusses a case in which he witnessed a Qi Gong master project Qi energy from his hands, causing a fluorescent light bulb to glow.

It is believed that these Qi Gong masters manipulate the flow of internal Qi through the meridians in their body until the Qi is projected externally. Acupuncture and acupressure manipulation effects a treatment for certain illnesses by stimulating certain acupuncture points in an effort to enhance circulation through the meridians and promote the function of the internal organs and the limbs which the meridians run through (Gao, 1997). It appears that acupuncture meridians, as described and utilized in traditional Chinese medicine, are electromagnetic in nature and so are vulnerable to disturbance by other electromagnetic energies (Thurnell-Read, 1995).

Oschman (2000) explains that there are energetic circuits in the living organism, in which electromagnetic information passes through on its way to every corner of the body. The flow of this energy is influenced by subtle energies in the environment, and disorders of the tissues in the body influence the flow of these charges in consistent ways, as described by traditional Chinese medicine (Oschman, 2000). These energetic circuits are

referred to as the living matrix, a high-speed communication network that links all tissues and parts of the body with every other part, resulting in an elegant and very efficient way of sending information throughout the body (Oschman, 2000). Becker (1985, 1990, 1991) describes the connective tissue that surrounds all neurons in the body, called the perineurium, as the second part of a 'dual nervous system' in the body – the classic nerve network widely studied in the West as well as the evolutionarily ancient perineural system, which operates on direct current (DC). Oscillations of the DC in the perineural system are called brainwaves, and one of the jobs of this system is to control the level of consciousness via connections with the pineal gland, thalamus, and reticular activating system. (Becker, 1985, 1990, 1991).

As it turns out, “the best introduction to the electronic circuitry of the human body is to be found in the study of acupuncture” (Oschman, 2000, p. 57). The acupuncture meridians are actually low resistance pathways for the flow of electromagnetic information through the living matrix (Morton & Dlouhy, 1989). These electromagnetic signals, like the Chinese concept of Qi energy, then enter each and every organ, tissue, and cell of the body through the intracellular matrix between cells and cytoskeleton within cells. “The meridians are simply the main channels or transmission lines (for electromagnetic signals) in the continuous molecular fabric of the body” (Oschman, 2000, p. 70). Some of these channels pass closer to certain organs within the body, ultimately relaying the strongest part of any signal travelling along that meridian to the corresponding organ. In this way, the Chinese are able to influence the health of specific organs by manipulating the flow of Qi energy along specific meridians.

For almost 5000 years, the Chinese have known that encouraging the flow of Qi energy through the body could stimulate healing of broken bones and soft tissue damage, help to cure disease, prolong life and prevent illness (Yang, 1998). The enhancement of Qi flow is facilitated by Qi practitioners or healers who use various message and touching techniques to enhance their patient's Qi flow and introduce Qi energy from their own bodies to their patient's bodies.

Today in North America, medical research is demonstrating that medical devices that produce pulsing electromagnetic fields of particular frequencies can stimulate the healing of a variety of tissues. These oscillating magnetic fields are being researched at various medical centers for the treatment of bone, nerve, skin, capillary and ligament damage (Oschman, 2000). Research being conducted in the West is also demonstrating the importance of the 'messages' that BioEM fields send throughout the body for overall health and damage repair. BioEM fields are thought to jumpstart the immune system into assisting in the repair of damaged tissue, including bone, nerves, and skin (Oschman, 2000). The propagation of BioEM fields throughout the body via highly conductive pathways can be compared the concept of Qi energy flow through acupuncture meridians, which the Chinese believe is crucial to maintaining health and injury repair.

### **PURPOSE OF STUDY AND HYPOTHESES**

Despite the abundant theoretical evidence supporting bioelectromagnetic (BioEM) energy as the western scientific correlate of Qi energy, very few rigorously controlled scientific studies have examined this relationship. As such, an exploratory experiment was designed and carried out with the intention of providing such evidence.

A Qi Gong healer will treat a lack of Qi in a patient by taking Qi energy in from the environment and projecting it into the patient: “Masters of shiatsu massage do not merely sense and redirect the flow of Qi, they transmit it from their own bodies into their patient’s body by way of the appropriate meridian” (Eisenberg, 1995, p. 112). Simultaneously, some martial artists project Qi energy into their opponents to cause a disruption in Qi flow, which allows them to overpower the opponent. As such, the absorption, manipulation, and projection of Qi is an integral part of traditional Chinese medicine and all theories of Qi energy.

If Qi energy is the same phenomenon as BioEM energy, and can be manipulated and projected in a similar way, it should be possible to detect this projection of BioEM or Qi energy with properly calibrated equipment. The detection of this energy and verification of its manipulation is the first step to further verifying the existence and importance of subtle electromagnetic fields in and around the human body. If these fields can be manipulated and influence human tissues as described in traditional Chinese medicine, the correlation of Qi energy with BioEM energy would be further supported.

All electric currents generate magnetic fields, the rate of current flow through the electrical coil determining the strength of the field. (Washnis & Hricak, 1993). Alternatively, when an electric current flows through a conductor, a magnetic field is produced around the wire, the strength of which is related to the amount of current flow (Oschman, 2000; Washnis and Hricak, 1993). Based on this knowledge, an experiment was devised with the use of copper-wire coils. Individuals with purported extraordinary Qi energy manipulation abilities were asked to project Qi energy towards the copper coils. Any fluctuation in the magnetic fields around the coil would then alter the electrical current

running through the coil. It was hypothesized that the participants would be able to emit Qi or BioEM energy at will, and this energy would result in fluctuations in the electrical current picked up by the coils.

## **METHODS**

### *Participants*

Three adult males with reported extraordinary Qi energy manipulation abilities participated in the study. All participants had several years of experience in Qi energy manipulation and were considered experts in their field. Informed consent was obtained from each participant after the nature and consequences of the experiment were explained prior to the initiation of the study.

### *Apparatus*

Passing an electrical current through a coil of conductive wire induces a directional magnetic field normal to the plane of the coil. The opposite is also true: A magnetic field that passes across a conductive metal coil will induce an electrical current in that coil. In this experiment, electromagnetic conversion was achieved using a custom built 3-coil system to passively detect any directional magnetic fields in the immediate environment. Each coil was one inch in diameter and consisted of 80 turns of copper wire. The three coils were arranged orthogonally to each other and attached to a rectangular piece of wood (Figure 1).

The coils were attached to custom built electronic amplifiers, which allowed the detection of electric current as low as .049 watts, across a band of frequency from 0 to

100,000 Hz. The raw signals detected by the coils were collected at a sampling rate of 1000 Hz and stored on a personal computer for analysis. Data acquisition was controlled using custom written software (MS Visual C++).

[Insert Figure 1 near here]

### *Procedure*

The three participants projected Qi energy at the coils over three separate trials. Each trial consisted of an initial control period followed by a "Qi projection" test period, followed by a second control period. Each period was 20 seconds long. Participants attempted to generate Qi flow using a different method for each of the three trials. Additionally, participants attempted to elicit current flow from different coils. Trial activity and timing is summarized in Table 1.

[Insert Table 1 near here]

### *Analysis*

For this study, the data were subject to a Fourier analysis between 0 and 120 Hz. A fast Fourier transformation was performed on the signal currents collected from each coil separately in order to obtain the magnitude of energy, measured as power, at each frequency during control and test conditions. An initial examination of the data revealed signal artifact at a limited number of select frequencies, due to electrical noise in the environment (power supplies, computer video boards, etc.). Therefore, an extremely selective filter was applied to all data whereby individual frequencies were removed if their

mean power levels were more than 50 times greater than surrounding frequencies. These frequencies were 22Hz, 60Hz, and their harmonics (e.g., 44 Hz, 88 Hz, 120 Hz).

The average power was calculated in sections over a range of 5 successive frequencies (following noise removal). For example, the mean power of signals generated between 0 and 5 Hz was calculated and compared for significant differences in power between the control and test conditions for each trial. Then the same procedure was followed for the 6 - 10 Hz range, and so on. A one-way ANOVA was used to compare signal power levels collected during a ten second control period at the beginning of a trial versus signal power levels collected during a ten second test portion in the middle of a trial versus signal power levels collected during another ten second control period at the end of a trial. Data were not combined across subjects, as a preliminary analysis revealed significant differences between them (see discussion). Each of the three coils was tested separately. All analyses were done using custom written software (Matlab, Mathworks Inc.)

## **RESULTS**

There are three main results to report. The first, and most basic, finding is that significant alterations ( $P < 0.05$ ) in power were detected in the coils between the test and control conditions. While the magnitude of these effects was not large, some interesting features were observed. Figure 2 illustrates three examples of changes in mean power between test and control periods in a specific five-Hertz frequency bin. We found that the power could either increase (Figure 2a) or decrease (Figure 2b) within a certain frequency bin. It is important to note that these changes in power between the test and control phases

occurred for specific frequency ranges. Table 2 summarizes these results across all frequency bins.

[Insert Figure 2 near here]

[Insert Table 2 near here]

Second, we found that the changes in power for these specific frequencies were directional. That is, these changes in power were mostly detected in one coil during a test phase, instead of all three coils simultaneously (Table 2). For example, Subject 1 showed a significant decrease in power on the test phase versus the control phases between 45-50 Hz in coil # 3 (upward coil), but there was no significant change in power for the other two coils (Figure 3).

[Insert Figure 3 near here]

Lastly, the alteration in power during the test phase occurred within specific frequency ranges (Table 2). Often, for a given trial a subject would induce changes in multiple frequencies. Hence, there was a change in the overall profile of power levels across the frequency spectrum. This is illustrated in Figure 4 for one subject across the 0-101 Hz range. Note the overall change in the power pattern across the spectrum, rather than a sharp spike at one specific frequency bin. Further, observe that in this subject displayed a power increase in the 1-10 Hz frequency range while power decreases occurred in other frequency ranges. Similar patterns were observed in the other two subjects, with certain

frequencies increasing (or decreasing) in power while a few would change in the opposite direction (Table 2). We found no consistent pattern across subjects.

[Insert Figure 4 near here]

## **DISCUSSION**

The salient result of this experiment demonstrates that it is possible for human beings to alter the electromagnetic environment around their hands at will. Specifically, the power seen at certain frequencies of the electromagnetic spectrum can be lowered or raised when a Qi Master "emits" what he believes to be Qi energy versus simply holding his hand over a detection device during a control phase. This suggests a link between willful Qi energy production and manipulation of the electromagnetic spectrum. These data further support the proposal that the concept of Qi energy and BioEM energy are one in the same. Eastern healers and martial artists have been claiming the ability to alter Qi flow by projecting Qi energy from their hands for thousands of years. It also appears that the directional influence of this change in power can be manipulated, as power changes were observed in only one of the three spatial dimensions at a time.

Interestingly, we did not observe a spike in a particular frequency, such as one would see if measuring output from machinery (such as the high energy radiation from an X-ray machine, for example). Rather, a subtle pattern change occurred across an array of frequencies. If indeed these power changes represent a willful manipulation of energy meant to affect another organism, a possible mechanism for such an interaction may be a

destabilization of that organism's equilibrium. Such disequilibria between systems can be seen, for instance, in the brain, whereby an imbalance in a neural control system in a patient (the basal ganglia, for example) can lead to neuropathological states such as Parkinson's or Huntington's disease. While we do not purport to understand what system might be affected by these power alterations across the frequency spectrum, it remains an intriguing possibility that Qi Masters may affect healing in their patients by "re-equilibrating" an imbalanced system (or a martial artist may affect a victim by "de-equilibrating" them in the same manner).

Admittedly, the results of this experiment are controversial. This is a preliminary experiment, and was designed to be exploratory in nature. Our original goal was to search for evidence of bioelectromagnetic energy, and to see if the subtle electromagnetic fields produced by and surrounding the human body could be manipulated at will. As such, we feel that we have accomplished our goal. At the very least, the data suggests that these individuals are somehow manipulating the electromagnetic spectrum around their hands. Their explanation for the results of the study is simple in concept but complicated in practice: Like countless healers, martial artists, and Qi Gong masters throughout history, they are projecting Qi energy onto the coil detectors.

In light of the significant results, there are limitations to the study, all of which we intend to address in future experiments. The first of these limitations, and the simplest to remedy, is the behavioural variability of the participants. As displayed in Table 1, the participants chose to try different techniques for each of the Qi projection trials. These different techniques, all based on Qi energy manipulation theory, were all designed to

enhance Qi flow. In future studies, participants will be asked to use a similar technique across all Qi projection trials to control for variability.

Secondly, it has been suggested that the participants were able to alter the power of certain frequencies in the test phase versus the control phases by altering the muscle tone in their arm and hand and by moving their hand. It is well established that muscle contractions alter electromagnetic fields. Secondly, movement of an electromagnetic field through space will influence existing "background" fields in that space. While this is a legitimate concern, we feel that this phenomenon did not influence the results of our experiment. First, we did not visually detect any movement of any of the participants' hands during the experiment. Secondly, we would expect to see wide spread alterations in the power of many frequencies across all three-dimensional planes with the movement of hands and contraction of numerous muscles in the arm and hand. As discussed, we mostly saw changes in only one of the coils at a time, representing a very specific one-dimensional alteration in electromagnetic frequencies. While we believe that the contraction of muscles and movement of the participants' hands do not account for the results, a future study will control for hand movement and muscle contraction more strictly by recording the participants' hand and arm closely and measuring for changes in muscle contraction between the test and control phases.

As is the nature of exploratory studies, we now find ourselves asking more questions than have been answered. Why are we seeing increases as well as decreases in power for specific frequencies? Are these Qi masters able to suppress as well as enhance the power of specific frequencies in the electromagnetic environment? Why are we seeing changes in very specific frequencies versus "swaths" of frequencies? Would we see the

same changes in power if an individual who has never even heard of the concept of Qi energy attempted to alter the electromagnetic spectrum around the coils? Future work will address these questions in more detail.

### **ACKNOWLEDGEMENTS**

The authors wish to thank Gordon Travers and Sarah Daley of York Karate-do, Toronto, Canada, without whose support this project would not have occurred. We further wish to thank Dr. Xiaogang Yan for his immeasurable technical assistance, and Dr. Matthew J. Hayat for his statistical advice and comments on an earlier version of the manuscript. Lastly, we would like to thank the 3 Qi Masters who took the time to participate in the study.

## REFERENCES

- Andersen, P. & Andersson, S. A. (1968). Physiological basis of the alpha rhythm. New York, NY: Appleton-Century Crofts.
- Baule, G. M. & McFee, R. (1963). Detection of the magnetic field of the heart. *American Heart Journal*, 66, 95-96.
- Beck, R. (1986). Mood modification with ELF magnetic fields: A preliminary exploration. *Archaeus*, 4, 48.
- Becker, R. O., Seldon, G. (1985). *The Body Electric: Electromagnetism and the Foundation of Life*. New York, NY: William Morrow and Company, Inc.
- Becker, R. O. (1990). *Cross Currents: The Perils of Electropollution, the Promise of Electromedicine*. Los Angeles, CA: Jeremy P. Tarcher.
- Becker, R. O. (1990). The machine brain and properties of the mind. *Subtle Energies*, 113, 79-97.
- Becker, R. O. (1991). Evidence for a primitive DC electrical analog system controlling brain function. *Subtle Energies*, 2 (1), 71-88.
- Burr, H. S. (1972). *The Fields of Life: Our Links with the Universe*. New York, NY: Ballantine Books.
- Dillman, G. A. & Thomas, C. (1992) *Kyusho Jitsu: the Dillman method of pressure point fighting*. Reading, PA: GDKI.
- Eisenberg, D. (1995). *Encounters with Qi: Exploring Chinese Medicine*. New York, NY: Norton & Company.
- Gao, D. *Chinese Medicine*. New York, NY: Thunder's Mouth Press.

- Morton, M. A. & Dlouhy, C. (1989). *Energy Fields in Medicine*. Kalamazoo, MI: John E. Fetzer Foundation.
- Oschman, J. L. (1993). Biophysical basis for acupuncture. The Proceedings of the First Symposium of the Society for Acupuncture Research. Rockville, MD: 23-24 January.
- Oschman, J. L. (2000). *Energy Medicine: The Scientific Basis*. New York, NY: Churchill Livingstone.
- Russek, L. G. & Schwartz, G. E. (1996). Energy cardiology: A dynamical energy systems approach for integrating conventional and alternative medicine. *Advances: The Journal of Mind-Body Health*, 12, (4), 4-24.
- Schumann, W. O. (1952). On the characteristic oscillations of a conducting sphere which is surrounded by an air layer and an ionospheric shell. *Zeitschrift fur Naturforschung* 7a: 149-154.
- Thurnell-Read, J. (1995). *Geopathic Stress: How earth Energies Affect Our Lives*. Rockport, MA: Element.
- Washnis, G. J. & Hricak, R. Z. (1993). *Discovery of Magnetic Health*. Rockville, MD: Nova Publishing Company
- Yang, J. M. (1998). *Qigong for health and martial arts: Exercises and meditation*. Boston, MA: YMAA Publication Center

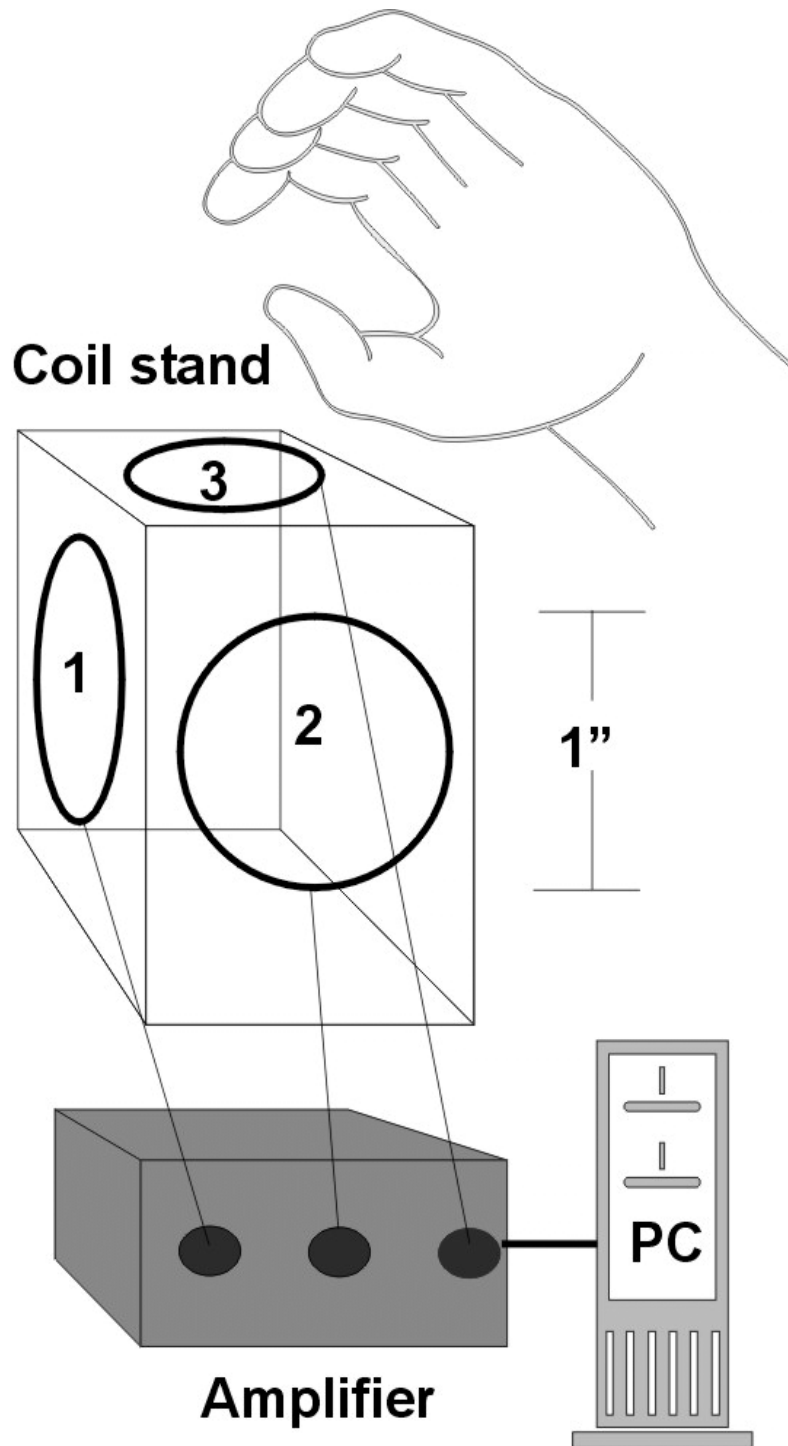


Figure 1. Coil arrangement and apparatus configuration for measurement of magnetic energy. Hand posture is for illustrative purposes only and does not reflect actual postures used in the study. Numbers refer to the coil number as referenced in Table 1.

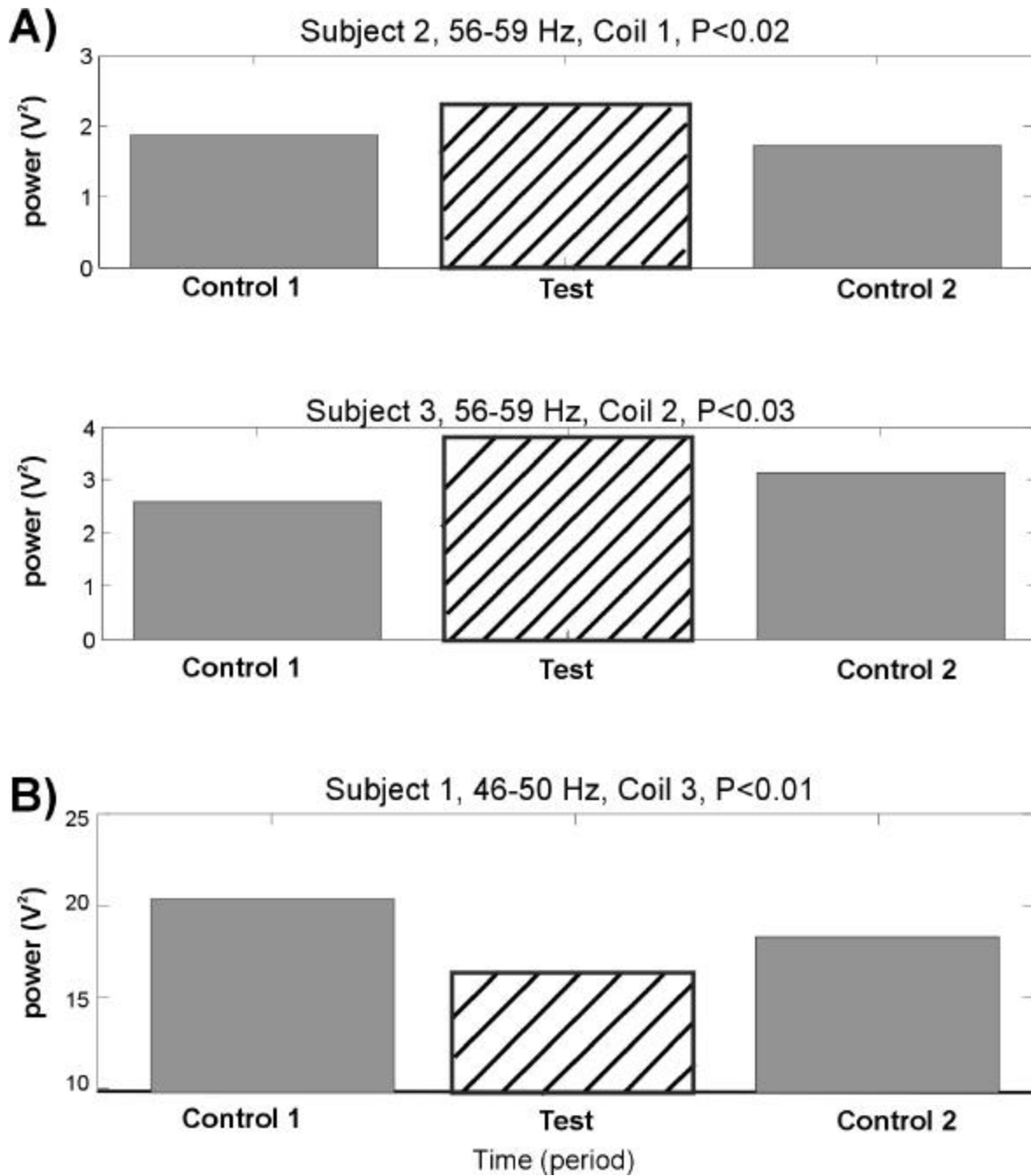


Figure 2. Changes in power (taken from an FFT analysis) between initial control period, test period, and second control period during Qi generation in three different subjects. Each period represents the mean power over the middle 10 seconds of each condition.

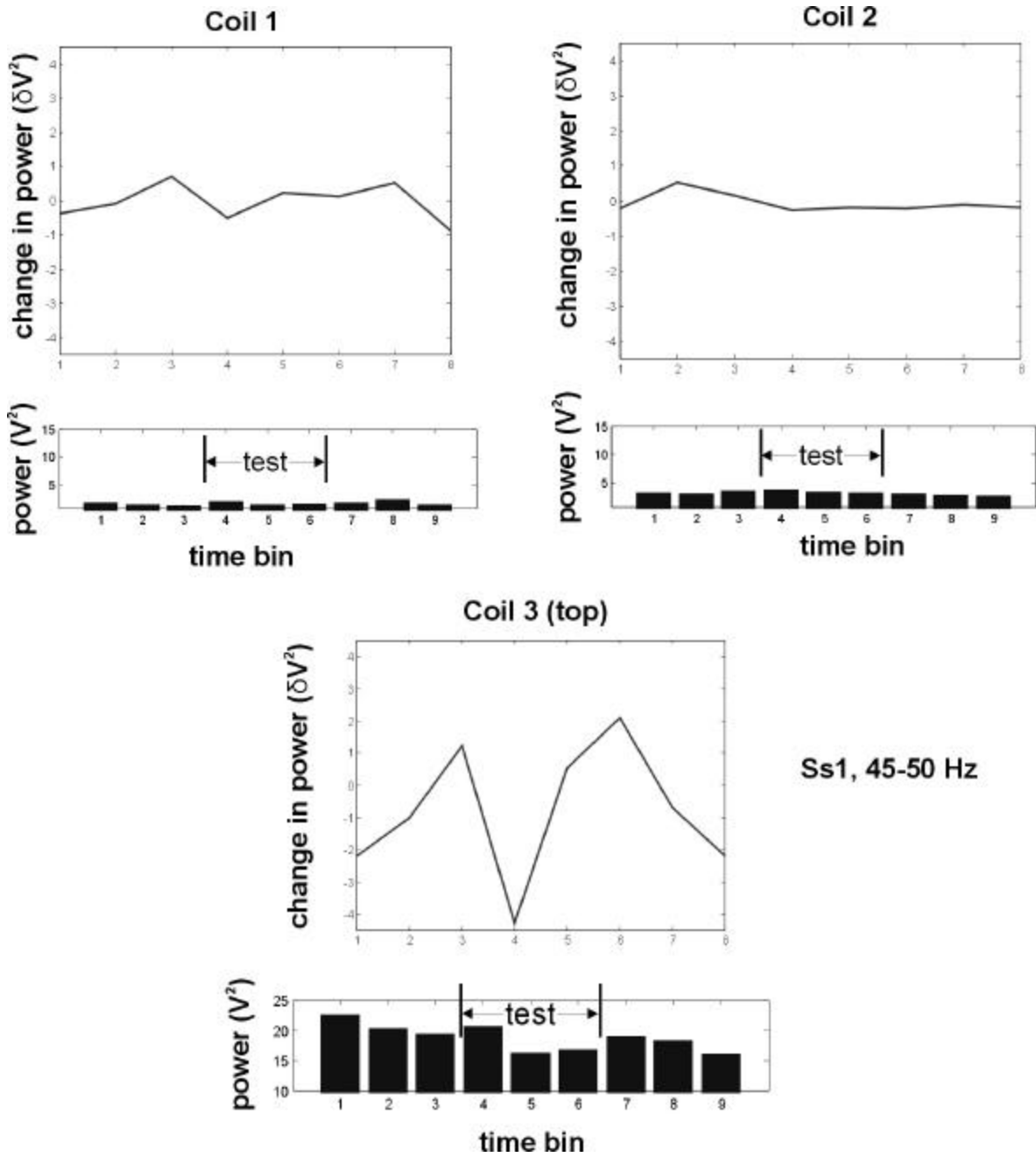


Figure 3. Power readings over time from each coil during one trial. The individual time bins are 5-10-5 second intervals during the first control (1-3), test (4-6), and second control (7-9) periods. Change in power is from the later bin to the earlier bin (e.g., power time bin#2 – power time bin#1 is change-in-power point one, and so forth). See Figure 1 for coil location reference.

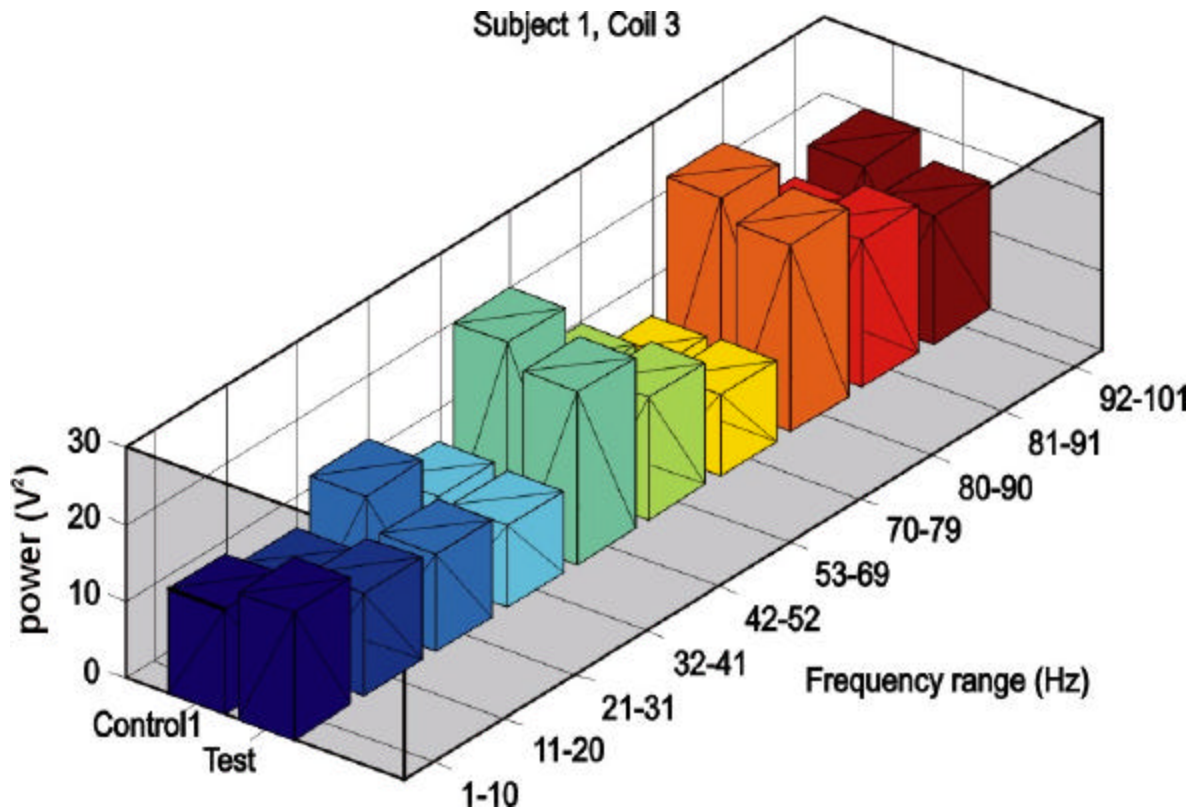


Figure 4: Change in power spectrum between first control and test period. Note the power increase in the first 2 bins (1-20 Hz) and power decrease in the other bins (e.g., 42-52).

Each bin is the mean power across 10 consecutive frequencies following the application of a selective filter (see methods).

Table 1: Experimental Procedure

| trial | subject | manipulation   | coil |
|-------|---------|--|------|
| 1     | 1       | straight projection, finger out  | 3    |
| 1     | 2       | straight projection, finger out  | 3    |
| 1     | 3       | straight projection, finger out  | 2    |
| 2     | 1       | both toes down, 2 fingers down   | 3    |
| 2     | 2       | both toes down, hands either side  | 3    |
| 2     | 3       | left toe up, 2 hands, right palm over top                                | 3    |
| 3     | 1       | 2 fingers, right hand on kidney  | 1-3  |
| 3     | 2       | left hand on kidney, hand movement                                       | 1-3  |
| 3     | 3       | left hand behind back with counterclockwise motion, right hand clockwise | 3    |

Table 2: Summary of significant ( $\Delta < .05$  unless indicated) power changes

| Frequency range (Hz) | Subject | Coil, ( $\downarrow$ :power decrease) | $F_{2,6}$ *:D<.01 |
|----------------------|---------|---------------------------------------|-------------------|
| 1 – 5                | 2       | 2                                     | 7.36              |
|                      | 3       | 1,2                                   | 6.56, 5.71        |
| 6-10                 | 2       | 1                                     | 5.67              |
|                      | 3       | 1,2                                   | 42.84*, 5.50      |
| 11-15                | 1       | 3                                     | 28.30*            |
|                      | 2       | 1                                     | 8.40              |
|                      | 3       | 1,3 $\downarrow$                      | 16.35*, 8.48      |
| 16-21                | 2       | 1,2,3                                 | 6.12, 6.58, 5.52  |
| 23-30                | 3       | 3 $\downarrow$                        | 21.60*            |
| 31-35                | 1       | 1 $\downarrow$ , 3                    | 9.51, 15.48*      |
|                      | 3       | 2 $\downarrow$                        | 8.05              |
| 36-40                | 2       | 1,3                                   | 11.17, 13.16*     |
|                      | 3       | 2                                     | 15.06*            |
| 41-43                | 2       | 1                                     | 13.72*            |
|                      | 3       | 1,2 $\downarrow$                      | 6.87, 48.99*      |
| 45-50                | 1       | 3 $\downarrow$                        | 61.58*            |
|                      | 2       | 1                                     | 25.95*            |
|                      | 3       | 1, 2                                  | 5.55, 6.31        |
| 51-55                | 2       | 3                                     | 4.91              |
|                      | 3       | 1 $\downarrow$                        | 15.39*            |
| 56-59                | 2       | 1 $\downarrow$                        | 6.34              |
|                      | 3       | 2                                     | 7.47              |
| 61-65                | 2       | 1                                     | 10.23             |
|                      | 3       | 3 $\downarrow$                        | 5.50              |
| 67-70                | 1       | 3 $\downarrow$                        | 10.57             |
| 76-80                | 3       | 2                                     | 15.37*            |
| 90-95                | 1       | 2                                     | 29.23*            |
|                      | 2       | 1 $\downarrow$                        | 10.23             |
|                      | 3       | 3 $\downarrow$                        | 36.24             |
| 96-100               | 1       | 1                                     | 13.65*            |
|                      | 2       | 1                                     | 6.95              |
|                      | 3       | 2 $\downarrow$                        | 9.03              |
| 101-105              | 3       | 3 $\downarrow$                        | 12.91*            |
| 106-110              | 1       | 1                                     | 11.50*            |
| 111-115              | 3       | 3 $\downarrow$                        | 41.83*            |
| 116-119              | 1       | 1                                     | 10.77*            |