

Qigong and Tai Chi: A Cultural and Scientific Overview*

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Introduction.

Qigong (Chi Gong) and Tai Chi (Taiji, Tai Chi Chuan) are words that are rapidly becoming established in the lexicon of the American household. This can largely be attributed to a recent proliferation of references in the media: in the Health and Lifestyle sections of newspapers and magazines as a frontier in complementary and alternative medicine, in global current events as a central component of the controversial Falun Gong movement in China, in film as a fighting technique seen in “Crouching Tiger and Hidden Dragon”, and in television commercials, including a recent spot for an anti-arthritic drug that allows the patient to practice Tai Chi. Although their recent ubiquity in the media has allowed Qigong and Tai Chi to become “buzz” words, their cultural and scientific significance remain unclear to most people. This article is intended to provide a brief background on these subjects.

Terminology.

“Qi”, the Chinese character for air, is a Chinese/Oriental term for an abstract form of energy that is considered vital to the mind and the body. Traditionally, Qi circulated through channels of the body known as meridians, is referred to as “internal” Qi. Proper flow of internal Qi is deemed to be necessary for good health, while blockage of it is associated with disease and dysfunction. When the energy is projected out from a certain part of the body (most frequently the hands) and transferred to another person or object, it is referred to as “external” Qi. While the ideas of Qi and Meridians remain unexplained in Western medicine, there is increasing scientific evidence that they may have great relevance to our understanding of human health and disease.

“Qigong” refers to the training that leads to development and control of Qi and its direction to different parts of the body. There are many styles or schools of Qigong, but they all share the following essential components. (1) Body regulation: the body is held in a stationary position (e.g., Sun Yee Standing Meditation) or goes through a series of motions (e.g., Tai Chi). (2) Mind regulation: the mind is cleared of all distractions and is focused on a single thought – a meditative visualization of Qi circulating in the body. (3) Respiratory regulation: slow and deep breathing, down to four cycles a minute, emphasizing abdominal breathing, a method of respiration that uses the diaphragm more than chest muscles.

Martial Arts Applications.

Qigong is a major component of the Chinese martial arts, Kung Fu. In defensive applications, directing internal Qi to certain parts of the body (e.g., arms, head) is believed to provide protection against forceful strikes from an opponent. In offensive applications, combining physical force with external Qi is thought to produce devastating effects particularly when directed at internal organs, acupoints (vital points used in acupuncture to stimulate Qi circulation), and meridians. Much like acupuncture, striking at different acupoints with a trained hand (e.g., a hardened knuckle or finger tip) or weapon (e.g., pen-like metal rod with a tapered tip) is believed to produce different indirect physiological effects. An example is shown in Crouching Tiger and Hidden Dragon, in which the elderly female fighter paralyzed her pursuing opponent with a hand strike at one of his acupoints. This effect was reversed when the victim received a quick acupoint massage from his rescuer.

Most of the over one hundred styles or schools of Kung Fu are classified as “external/hard styles”, including Shoalin, White Crane, Wing Chun, Hung Gar, and Choy Li Fut. These styles emphasize hard blocks and strikes, and power derived from muscles. Tai Chi, together with Bagua and Hsin I, are the three classified as “internal/soft styles”. They emphasize slow, soft movements, and the combining of muscular power with Qi energy. Within the Tai Chi school of training are three main types of routines: (1) Tai Chi Chuan (chuan is the Chinese word for fist), a bare hand routine consisting of a series of 24 movements in the short version or 108 movements (many are repetitions) in the long version. The term Tai Chi is commonly used as an abbreviation for one or both of these versions. (2) Tai Chi Sword. A routine involving the use of a long, double edged, straight sword, with movements based on Tai Chi Chuan. (3) Tai Chi Push Hands, a pre-arranged routine or free sparring involving two opponents using basic offensive and defensive techniques of Tai Chi Chuan.

There are five main sub-styles of Tai Chi Chuan. The Yang style is by far the most popular around the world, often practiced purely as a form of physical exercise. This style was modified from the Chen style, which combines some slow movements with explosively quick strikes, blocks and kicks. To the casual observer, Chen style Tai Chi appears to be quite similar to many of the external/hard styles of Kung Fu. The soft, slow, and circular movements of the Yang style, on the other hand, have the appearance of the elements of a graceful dance. In fact, these movements are designed to be highly effective defensive or offensive techniques. When these movements are combined with coordinated deep breathing cycles and meditative visualization of Qi circulation, the exercise becomes a form of Qigong training. The basic philosophy behind the Yang style is “moving 1,000 pounds of force with 4 ounces of effort”, based on the physics principle of mechanical leverage as opposed to fighting force with force in most external/hard styles. When the movements are sped up in a real fighting situation, Yang style Tai Chi is as effective as any other highly advanced styles of self defense.

Exercise for Good Health.

While the martial arts applications of Qigong and Tai Chi provide entertainment value in Kung Fu novels and movies, it is their role in human health and therapy that can potentially make the most impact in our daily lives.

To begin with, Qigong and Tai Chi are excellent forms of physical exercise. A complete routine of Yang style Tai Chi Chuan exercises practically every muscle, joint, and tendon in the body. There are many studies documenting that regular Tai Chi training leads to significant improvements in muscle tone, blood circulation, and body posture, flexibility, and balance. The stationary stances of Qigong training also build strength and endurance in the major muscle groups, particularly in the arms, legs, and buttocks. While Qigong and Tai Chi are not sufficiently strenuous to produce a high level of cardiovascular benefit or to cause quick weight reduction, their slower pace and minimal stress on muscle, bones and joints make them very accessible to people of all ages and levels of athletic ability. Thus, Tai Chi has become a frequently recommended form of body conditioning exercise for the elderly and for patients undergoing rehabilitation.

The potential health benefits of Qigong and Tai Chi extend to the mind and the brain as well. Meditation and the visualization of Qi circulation are excellent for mental relaxation. The accompanying deep breathing cycles and physical routines, both known to be mechanisms for stress relief, provides the extra advantages of exercising the lungs, diaphragm, muscles, and increasing oxygen supply to the brain and the body.

Therapeutic Applications.

Besides the mental and physical benefits in health maintenance, the most important feature of Qigong and Tai Chi is their value as therapies for serious diseases. The most documented of such clinical applications is in the treatment of high blood pressure. In an extensive study involving 1,800 patients at the Qigong Hypertension Unit of the Shanghai Ren Jin Hospital, regular Qigong practice was reported to significantly reduce blood pressure (15-20 mm) and pulse rate. Interestingly, these results are consistent with a study at the Division of Behavioral Medicine of the Harvard Medical School. Researchers there, who started out studying those practicing transcendental meditation, found that a physiological pattern termed the “relaxation response”, characterized by lower pulse and blood pressure and reduced oxygen demand, could be obtained by anyone who follow three basic steps similar to those involved in Qigong: (1) sitting quietly, (2) concentrating on one’s breathing, and (3) repeating a word or idea, and disregarding other thoughts as they come to mind.

There is also anecdotal data on how Qigong is effective for the treatment of other diseases, including migraine headache, chronic back pain, arthritis, diabetes, and cancer. These effects are believed to be produced by the development and circulation of internal Qi by the patients through Qigong or Tai Chi training. Similar effects have been reported to be caused by the transfer of external Qi from a Qigong practitioner to the patient through an acupuncture needle (Qigong Acupuncture), by manual contact (Qigong Tui Na and Qigong Massage), or through the practitioner’s hands from a distance of several

inches. Such reports on external Qi therapy hold promise, but more large scale clinical studies such as the upcoming National Institutes of Health's projects in the general area of energy healing need to be pursued in order to substantiate and explain the ways in which Qi might be an effective therapeutic agent for treatment of serious diseases.

Scientific Research and Interpretations.

In general, experiments aimed at characterizing and measuring external Qi with available scientific instruments have yielded unconvincing results. Researchers have either failed to detect this type of energy, or find that it is marginally weak and irreproducible. Reports claiming successful measurement of external qi are often unreliable because experiments were frequently performed on a single Qigong expert and were deficient in proper negative or positive controls.

It is important to note, however, that unsuccessful attempts to measure external Qi do not necessarily invalidate claims of its effectiveness in treatment of diseases. It is still possible that Qi energy below the sensitivity or outside of the frequency range of the instruments used can produce healing effects when properly directed at vital areas of the body, such as in Qigong massage and Qigong acupuncture. Moreover, the psychological phenomenon known as the placebo effect, where a therapy achieves real results because the patient believes in its powers, could be a significant factor in the efficacy of this type of therapies. More studies are clearly needed to answer many of these intriguing questions.

In regard to the claims of using Qi to protect the body against external forces, as seen in martial arts demonstrations, the effects can often be explained by simple laws of physics. For instance, the frequently seen feat of a Qigong expert having many layers of bricks broken upon the body by a sledge hammer looks impressive but can be performed by practically any untrained person. Here, the large kinetic force of the heavy hammer is absorbed and dissipated by the breaking bricks so that almost none of it reaches the person below.

In contrast to the largely unsuccessful measurements of external Qi, studies on the beneficial effects of the practicing Qigong and Tai Chi on health and diseases have yielded many revealing results. An emerging theme from several lines of experimentation is that such training allows the practitioner to acquire the ability to consciously control certain involuntary physiological functions (e.g., heart beat, blood vessel dilation, digestive process, neurotransmitter and hormone secretion). Such functions are normally regulated by the autonomic nervous system, which is sub-divided into the counteracting sympathetic and parasympathetic components. The former is activated by physical and mental stress while the latter is enhanced by a state of relaxation. Apparently, the way Qigong affects the autonomic nervous system is by inhibiting the sympathetic and stimulating the parasympathetic components. Measurements taken at the Shanghai Qigong Research Institute showed that during Qigong practice, there is a significant increase in the physiological parameter of "heart rate variation", a known indicator of the parasympathetic nervous system. There are many studies linking a decrease in this parameter to heart disease and aging, conditions

aggravated by mental and physical stress. Researchers at the Meridian Research Laboratory of the China Academy of Traditional Chinese Medicine in Beijing have found that during Qigong practice, a change in brain wave pattern (transposition of alpha and beta waves) is detected in electroencephalograms (EKG's). These two studies taken together suggest that the combination of the physical and mental training of Qigong and Tai Chi can alter brain function in a way that indirectly affects the autonomic nervous system, resulting in an increase in the healthful functioning of the cardiovascular and digestive systems, etc.

The changes in the autonomic nervous systems induced by Qigong and Tai Chi can also explain how such training could increase the body's resistance to infectious agents and ability to fight diseases such as cancer. There is an increasingly large volume of scientific literature documenting that the strength of our immune response is closely linked to our mental state. It has been shown that a positive state of mind enhances our immune system while mental and physical stress produce the opposite effect. This vital mind-body connection is mediated by the autonomic nervous system mainly through the secretion of neurohormones and neurotransmitters that affect cells of the immune system

Finally, there is increasing data supporting the notion that the mind-body actions of Qigong and Tai Chi might share certain mechanisms with acupuncture therapy. Ongoing research at the University of California, Irvine is shedding some light on this subject. Using the technique of functional magnetic resonance imaging (fMRI), investigators have shown that insertion of needles in different acupoints on the arms and legs leads to increased mental activity in specific parts of the brain. This observation is consistent with acupuncture induced changes in electroencephalograms taken at the Meridian Research Laboratory of the China Academy of Traditional Chinese Medicine in Beijing. In another study at the University, the lowering of chemically induced high blood pressure and heart dysfunction in animals by acupuncture treatment was found to be mediated by endorphins, a class of signaling agents secreted in the brain. These results collectively suggest that at least some of the effects of acupuncture on various bodily functions are mediated by stimulation of brain function in a manner similar to that of Qigong and Tai Chi. Thus Qigong and Tai Chi could be regarded as a natural substitute for acupuncture, a healthful long-term activity for disease prevention and treatment with the added advantage of physical conditioning. Further studies aimed at comparing the mechanisms of action and benefits of Qigong and acupuncture are in progress at the University.

* NOTE: Ever since the author was growing up in Hong Kong, he trained with a variety of prominent Kung Fu teachers (sifu's), initially in such external/hard styles as Shaolin, Wing Chun, White Crane, and then concentrating more on the internal/soft styles of Tai Chi, Hsin I, Baqua, and on the Wu Dong/ Sum Yee style of Qigong in the past dozen years. More recently, he extended his academic research interest from the study of the molecular mechanisms of natural products (including compounds derived from Chinese herbs) on cellular movement and contractility, to the hi-tech investigation on the effects of Qigong and Tai Chi on the human body. This essay is based on his martial arts background and information he gathered from the scientific literature, seminars, visits to major centers in Traditional Chinese Medicine in China and Taiwan, and research associated with the Samueli Center for Complementary and Alternative Medicine at the University of California, Irvine.

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