A Scientific Perspective of the Three Harmonies Principle of Taijiquan

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ABSTRACT

The Three Harmonies helps to regulate whole-body motion in harmony by balancing and aligning the movements of the body segments. Taijiquan uses the fangsong-relaxation modality to resolve the switching back and forth of the active muscle forces and the passive tensional forces of tendons, ligaments and fascial tissues. Fangsong induces the modulation of the muscles to resettle in a better state of balance, thus is necessarily a manipulation of the fascial tissues enveloping the muscles, organs and structures. In so doing, fangsong-relaxation cultivates the cognition and sensation of the fascial tissues enveloping the muscles, organs and structures. This gives rise to maximal force potential in balance—the force of neijin (internal strength)—in response of application. Crucially, the settling into balance by fangsong functions as a neutral countermovement in the stretch-shorten cycle that primes the muscle-tendon unit in an ever-ready state of action, which endows neijin with the liveliness of response. Secondly, the fangsong manipulation of the fascial tissues serves as a fascial massage and release that provides relief to chronic pain syndrome caused by tenseness of muscles and fascia, a therapy that accrues with the many health benefits of Taijiquan. Lastly, but not least, the attentiveness required in the fangsong process develops into the meditation component of the practice which brings tranquility and the insight of mindfulness. Taijiquan thus bestows the triple gems of neijin, health well-being, and equanimity.

1. Background

Performance in sports and martial arts is an art of body motion, which is an articulation of the movements of body segments linked at the joints. How well one performs depends on how well the segments work in functional harmony in the mechanics of motion transmission. To excel, the body must be able to maneuver the movements in an interacting situation with sufficient strength and power in timeliness.

Physiologically, this requires an integration of the sensory and motor systems and the cognitive awareness of kinesthetics at the myriad joints. We may have control of the voluntary muscles to effect an action, but the control...
our torso is not predisposed to turn as a whole. Rather, the chest and abdominal regions tend to rotate in opposite directions at the thoracic-lumbar region. This is due to the effect of lordosis, the spinal curvature, by Gracovetsky’s Spinal Engine Theory, which is discussed in the author’s paper [3]. Another factor that can affect training is the body’s leg length discrepancy.

Given the hundreds of joints, the discipline of balancing and aligning the body segments is a monumental problem. To compound it, adjustments made at one joint can affect that at the others, requiring a recalibration each time, due to the tensile integrity of the musculoskeletal frame, which renders the task nigh impossible.

Amazingly, we find a remarkably practical solution to this intractable problem in Taijiquan’s slow-motion methodology. The Taiji theory of regulating body motion is based on Yin-Yang Principles, a philosophy that predates science. Moreover, the concepts and pedagogy in the traditional literature are written in classical verses, more for form than for clarity, so are subject to interpretations. Nevertheless, the training relies on the age-old concept of Qi energy to discipline body motion by the process of fangsong-relaxation. As it turns out, Qi helps to develop the sensation of body kinetics.

Although Taiji theory does not translate well in physics and physiology, the body relates readily to the functions of Qi and fangsong modality. This paper asserts that these functions rely on the medium of fascial tension which lends connectivity to the body segments and the viscoelastic behavior of the muscle-tendon units.

Doing so clarifies how Taiji training cultivates the cognitive sensation of fascial tension as Qi to regulate balance and to align the momenta of the segments in whole-body motion. This generates the ideal Taiji motion, one in accordance with the Yin-Yang Principles. The significance is that in response of application, the force that ensues from the ideal motion will be timely, and of the right force vector.

We draw on the Ten Essential Principles of Taijiquan by Chen Changxin (1771-1853), which are quite relatable when the concepts are framed on the musculoskeletal structure [3]. By focusing on one of them, Three Harmonies Principle, as a representative, we are able to bring out the biomechanics of the ideal motion while not being overextended in scope. This paper complements the author’s recent publication, Healthcare and Sports from the Perspective of Qi, Fascia, and Taijiquan [4].

Chart 1 gives an overview of the discussion of the first
half of the paper; Chart 2, the second half.

Chart 1. Three Harmonies Principle

2. Muscle-tendon Unit and Viscoelasticity

A skeletal muscle typically attaches to bones via tendons at both ends, which is described as a muscle-tendon unit (MTU). When the muscle component contracts, it stretches and generates a tension in the tendons, resulting in a tensile force that moves the attached bones at the joint.

A MTU is subject to the external forces of gravity, physical interaction, or other connected MTUs; it will lengthen, shorten, or remain the same, depending on whether the sum of the applied forces is stronger, lesser, or equal to its tensile force.

There is a constant interplay between the muscle’s contractile force and the tensile force. Muscle contraction occurs with the expenditure of ATP energy, so the loading by the muscle force is active. Meanwhile, the tensile force in the tendons is passive and is generated by their elastic property.

At the end of muscle contraction, with the overall strain maintained, internally, the tendons adjust in strain by the recoil of the tensile force. This lessens the tensile force, causing a relaxation of the stress in the MTU. This exhibits the characteristic behavior of viscoelastic material undergoing stress-relaxation when held under a constant strain.

If the muscle contraction in the MTU maintains a constant tensile force, the tendon will stretch, causing a “creep” in length. This manifests the characteristic viscoelastic behavior of undergoing creep in strain when held under a constant stress.

The stress-strain behavior of a MTU is viscoelastic. Our body does not behave like a rubber band. In flexing our arm, it cannot snap back in recoil to slap us in the face when the extensor muscles are relaxed. Unlike the property of elasticity, the response to loading and unloading is not immediate. The deformation and recovery of MTUs are gradual and time-dependent.

The stress-strain relationship of viscoelastic material is not governed by a constant Hooke’s Law. The stress is proportional to the rate of strain. At higher strain rates, tendons become stiffer and thus more effective in force transmission. So fast-twitch muscles in MTUs transmit stronger forces.

Contributing to the viscoelastic property of MTUs are the connective tissues covering the muscles and their adjacent structures. The muscle unit is enveloped by epimysium fascia; its fascicle subunit-bundle of muscle fibers, by perimysium; and the individual fibers, by endomysium. These fascial connective tissues and the collagenous ligaments that secure the bones at the joints are viscoelastic. In the muscle contraction, tension is also created in the fascial connective tissues and the ligaments. The MTU’s tensile force that moves the connected bones is the sum of the exchange of forces between the muscle contractile force and the tensional force of the tendons in series, and the tension of the components of the connective tissues and ligaments in parallel. More discussion of viscoelasticity of MTU can be found in Taylor [5], and of tendon elasticity in Alexander [6].

The fangsong modality, the key operational process of Taijiquan to be discussed soon, utilizes the viscoelastic property of the MTUs and the fascial connective tissues.

3. Fascial Tensional Network

The skeletal frame is held together by muscles, tendons, ligaments and fascial connective tissues. These fascial coverings extend across the entire frame and envelop internal organs and other structures, thus forming a continuous body-wide web of physical connectivity with viscoelastic properties, referred to as the fascial tensional network.

The connective tissues are made up of protein fibers (collagen and elastin), ground substance (the fluid content), and fibroblasts (cells), but they vary in composition and form, depending on function. The deep fascia that surrounds individual muscles is a denser connective tissue with a higher proportion of collagen fibers. The fascia of loose connective tissues which envelop and support organs is more fluid with a larger content of ground substance and spreads throughout the body, filling the spaces between structures and surrounding the blood and lymph vessels. For a more comprehensive review of fascia, see Schleip [7].

The tension in the fascial network is generated by the interacting MTUs and fascia that sum up to the
tensile forces that move and support the body segments connected at the joints. More than a physical connectivity, fascia provides a tensional link in force transmission. The task of regulating force transmission then is to cognize the tensional link and manipulate it. However, one is confronted with the same problem of the myriad joints as the fascial tensional network is formed of a complex of tensional links which pass through many intersections at the joints.

Taiji training does not focus on the individual tensional links but on perception of the fascial tension at a joint and between joints of an action at the functional level of balance and alignment. The modality of fangsong to be discussed next, cultivates the cognitive sensation of the fascial tension as to its functional effect in the resolution. We shall see that fangsong nurtures Qi as the cognition of kinesthesia via the fascial tensional network and harnesses it in the discipline of body motion.

4 Qi and Fangsong (放松)

Fangsong, which means to relax by letting go, is a modality to resolve muscle forces, tensional forces of tendons, ligaments, and fascia, against gravity and forces of other bodies, towards balance. It is the most significant operative word in Taijiquan. The very practice of the art is about fangsong. To see how fangsong works, stretch out an arm to the side level with the shoulder and hold it stationary. A combination of muscles is activated in the task, often with the shoulder muscles dominating. What are the preferred combinations? The fangsong mechanism helps to resolve it.

Before long, the arm feels tense and fatigue sets in, causing discomfort. Instinctively, the body responds by relaxing or letting go that acts to reduce the tenseness, thereby bringing some relief. This represents the rudimentary mechanism of fangsong: to relax or let go upon sensing tenseness. It tempers the tensile forces of the MTUs to rebalance, thus also of the myofascia.

On the other hand, one may sense a laxity, a lack of tensional connectivity to the hand, which is an indication of an imbalance of the muscle-and-tendon exchange within the MTUs. To correct this, the body can respond by stretching the arm to transmit tension to the hand. As active stretching may inadvertently introduce tenseness, the stretch-command is modified to “stretching internally” to minimize the prime-moving muscles.

This internal stretching is induced by the training admonition to “use mind-intention (yi 意) but not force (li 力).” Although the biomechanics is unclear, the instruction has the effect of restraining excessive muscle forces. Another practice exhortation is to let “the shoulder sink and elbow drop” (chen jian zhui zhou). The fangsong of the arm is best simulated by having someone hold the tip of middle finger and letting the arm hang like a rope. This induces the support of the arm against gravity more by eccentric muscle contraction and passive tensile forces.

The fangsong mechanism is guided by the dual rule: fangsong-relax upon sensing tenseness of excessive muscle activity and stretch internally upon sensing laxity or deficiency of muscle activity. However, the rule is not about allocating so much muscle activity here and so much there as balancing in a scale, which the body cannot do.

First we develop the cognition of what is tense and what is slack. Then the fangsong operation is simply to be less tense or less slack. Pragmatically, it is to settle in the middle ground between tenseness and laxity. Then by refining the fangsong practice, the margin of errors gets smaller and smaller, converging to higher states of balance. Effectively, fangsong settles the body segments into a better balance each time, drawing more on the passive tensile forces of the MTUs.

The continual application of fangsong cultivates the cognitive perception of the MTU activities as to their errors of being excessive or deficient and to their resolution. Taijiquan’s slow-motion modus operandi is very conducive to the attentiveness necessary to perceive the fangsong mechanisms. The sensation of tenseness or laxity is transduced from the feedback of the mechanoreceptors in the muscle spindles and the golgi tendon organs, as well as of proprioception.

Crucially, the cognitive perception, though subjective, is grounded on the fangsong tempering of the tensional and muscle forces of the MTUs coupled with the operational resolution of balance, based on the medium of fascial tension. Also, the tempering and settling have the effects of massaging and manipulating the fascial connective tissues. This gives us the proposition that the cognitive perception based on fascial tension, developed thus, is what Taijiquan perceives as Qi. For a more comprehensive discussion of Qi, see the author’s paper, Science of Qi.

This provides a scientific basis of the traditional theory of Taiji practice as one primarily of developing Qi and the harnessing of Qi via the fangsong modality to discipline body motion to be in accord with the principles of Yin-Yang balance.

However, the task of applying fangsong to the hundred joints of the body remains, which clearly is daunting. This is where the Three Harmonies Principle comes in with a simplification scheme of the major joints into three corresponding pairs. More importantly, the review of
the Three Harmonies Principle from the perspective of biomechanics offers more insight to fangsong, Qi, and neijin. (See Chart 2 for an overview.)

**Chart 2. Three Harmonies Principle Overview**

5. **The Principle of Three Harmonies (Sanhe 三合)**

The Principle of Three Harmonies, externally, refers to the three pairs of corresponding joints: the shoulder and hip (kua 腰), the elbows and knees, and the hands and feet. By classifying the body’s myriad joints into a matrix of the three correspondences of joints, fangsong can be systematically applied to resolve their harmonies.

This sets up a training pathway for fangsong to temper the MTUs to resolve the tensile forces towards balance and alignment a pair at a time. Since the major joints represent the basis of the body frame, the classification strategy will develop the Qi-perception of the fascial tension body-wide.

The fangsong resolution of the three correspondences can then be extended to cross-pairings, between the left hand and the right foot, the left elbow and the right knee, and the left shoulder and the right hip. Then the left and right can be switched in the alternative cross-pairings. It can also be further extended to other pairings between the head and hand, the hand and body, and the body and footstep. In the process, the Sanhe Principle inspires the harnessing of the fascial tensional network as it is developed, namely, the utilizing of Qi to discipline body motion grounded on balance and harmony.

Here, we will review in more detail the shoulder-kua correspondence, which defines the torso. This will be done under three subsections: the thoracolumbar fascia, the kua junction, and dantian centrality.

6. **The Shoulder-Kua Correspondence**

Since the torso forms about half the mass of the body, its momentum is a determinant in force transmission. The force output potential of waist-power actions in sport and work rides on the torso moving as a whole in unified momentum. This requires a discipline of the muscles of the torso and the load transfer between the ribcage (chest) and the kua.

i) **The thoracolumbar fascia (TLF)**

Unlike the tendons of arm muscles, which are rope-like at the ends on attaching to the bones, many tendons of the torso are sheet-like where the muscles attach along the edges on a wide area. The most prominent tendon is the thoracolumbar fascia (TLF).

The TLF is often depicted as the white diamond-shape region of connective tissues at the lumbar region of the back (Figure 1). The body’s two largest muscles, the lats, attach on the upper two sides, and the glutes on the lower two sides. Also, the trapezius muscles above attach at the vertex region of the TLF. The fascia extends from the iliac crest to the nuchal fascia at the nape of the neck. The psoas major, the quadratus lumborum, and the erector spinae muscles are enmeshed between the TLF’s three layers. The abdominal muscles wrap around to attach on both sides.
in the load transmission of the torso, thus in the discipline of its angular momentum.

The harmony of these forces is induced by the fangsong resolution of the shoulder-kua correspondence, which chips away at the errors of the muscle activities of the trunk. This cultivates the Qi-perception of the TLF with fascial connectivity to the linea alba on the front, which helps harmonize the abdominal muscles and the erector abdominis.

Inspired by the Three Harmonies Principle, the Qi-cognition of the TLF tension is further extended body-wide to the fascial tensional network via the fangsong of the matrix of joints. At each step of the way, the fascial connective tissues are manipulated and released from tightness by fangsong.

ii) The paramount status of the kua junction

The kua complex consists of the pelvis and the triangle of joints, the sacroiliac joint and the two hip-joints. It is identified by the inguinal fold on the front, the lower region of the thoracolumbar fascia at the back, and the gluteus maximus rounding the butt. It forms the platform where the torso sits, poised in balance, to lend support to the maneuverings of the upper body.

Interspersed in the slow-motion Taiji calisthenics are some movements of fist and elbow strikes, which are expressed with explosive power called fajin (发劲), as in a demonstration by Chen Zhenglei [10]. These power movements share the same musculoskeletal demands of the waist-power actions in sports. However, to generate the explosive fajin, Taiji training is still primarily focused on the fangsong of the kua complex to produce the right motion in harmony but not on resistance or weight-regime exercises to exert muscle forces.

Any force action generated in the upper body must be supported by an equal and opposite reaction force at the base of the lower body (by Newton’s Third Law). For maximal force, the action-reaction control must be at the kua junction as it divides the upper body and lower body most proportionately. If it was set at the knees or ankles, often inadvertently in sports, to pack more mass in the upper momentum, injuries would result due to the disproportionately increased pressure at the lower joints.

Taijiqun places paramount emphasis on the fangsong of the triangle of joints in the kua complex to ensure that the torso turns as a whole in the power actions. The main obstacle to the discipline of the torso’s angular momentum is the effect of lordosis by the spinal engine (Gracovetsky). As mentioned briefly in the background, the spinal engine facilitates walking by causing the thorax to rotate in the opposite orientation to that of the lumbar to zero out the rotational momentum in generating propulsion [11].

The Qi-perceptivity helps to neutralize the spinal engine effect by applying fangsong to keep the lordosis in the sagittal plane and the kua platform level, thus ensuring the unified rotation of the torso. This consolidates the kua junction as the hub of force transmission between the upper body and the lower body to the ground. It places the control of the action-reaction force at the kua junction, thus defining its paramount status.

In this way, via the fascial tensional network, the action at the kua drives the force up the upper body to a punch, say, while the reaction force drives down to anchor the feet solidly on the ground. The biomechanics of the pelvic girdle and the sacral iliac joints in the load transfer between the spine and legs is studied by Vleeming, A et al. [12].

iii) Dantian Centrality

Because of the paramount status of the kua, it stays under focus in the fangsong resolution of the major joints of the Sanhe Principle, implanting the role for the kua junction as a basis of reference. This entails a constant fangsong tempering at the triangle of joints, forging a point of centrality of the kua complex. This center of reference coincides with the dantian, a point located at three-finger width below the navel, and a third of the way inside.

The center may seem localized to the kua but it serves as the center of reference of the three pairs of joints via the kua, thus of the whole-body frame. In other words, the dantian is nurtured as the center of the body-wide fascial tensional network. Thus, Qi is cultivated as the cognitive sensation of the fascial tensional network centered at the dantian [13].

In the viewpoint of Qi, the unwieldy task of resolving the errors of muscle activities of the myriad joints operationally becomes one of fangsong resolution to cultivate Qi centered at the dantian. This is cognized as Qi accumulating in the lower abdominal region, concentrating at the dantian, and functionally, as Qi sinking in the dantian (Qi chen dantian 沉丹田). Therefore, the fangsong process is also viewed as cultivating dantian Qi. This describes the concept of dantian centrality (yi dantian wei hexin 以丹田为核心) as expounded by Chen Xiaowang [14].

At the core of the mastery of Taijiqun is the cultivation of the fullness of dantian Qi. The Qi cultivation incorporates a utilitarian aspect, namely, that it is harnessed as it is developed to discipline the mind and body, thus enhancing its growth further. It leads to the actualization of the dantian functioning as the center of the fascial tensional network, perceived as Qi. This operative feature that provides for manipulation and control of body motion by the conscious sensation of Qi adds a dimension of art
to the physiology and physics of fascial tension, and to fascial manipulation and release.

7. The Internal Three Harmonies

The Principle of Three Harmonies discussed above are of physical or external character. It is complemented by the Three Internal Harmonies of (1) the “heart (xin 心) and mind-intention (yi 意),” (2) “Qi and force (li 力),” and (3) “muscle-tendon (jin 筋) and bone (gu 骨).”

i) The Harmony of “heart (xin) and mind-intention (yi)”

Health and sport performance can be adversely affected by one’s state of emotion. Emotion affects one’s response. Taijiquan addresses the mind and body connection by developing a meditation component in the course of the slow-motion practice.

For the fangsong mechanism to work we must have perception of what we are doing. This means that we must be attentive to the practice. But the mind is restless like a monkey, with thoughts darting in and out. And we are vulnerable to emotions, which can undermine the practice.

Inherent in attentiveness is the awareness of the mind wandering off, although it may be a while before one becomes conscious of it. At the moment of the awareness of the mind wandering, one mindfully trains it to trigger a return to attentiveness. This tempers and restrains the unruly mind that reinforces attentiveness. And one develops mindfulness of the practice.

This constitutes the meditation component that fore-stalls distracting thoughts, thus nurturing the harmony of the heart and mind. The mindfulness developed progressively sharpens the perceptiveness of the fangsong practice to resolve the tensional errors at the joints and consolidate the dantian centrality. It forms the operational factor that ensures that the margin of errors in the fangsong-resolution process becomes progressively smaller, converging to increasingly higher states of Taiji balance.

A greater prize of mindfulness is that one becomes aware of the perturbing factors of anger, hatred, avarice, and a slew of other unsettling emotions. Mindfulness triggers a restraint that subdues the unwholesome thoughts, which leads to a more tranquil mind.

The very nature of the practice of harmonizing “mind and heart” is one of self-cultivation.

The journey leads to the higher realms of meditation that bestow more experiential insights of being with the present and mindfulness, with the rewards of tranquility and equanimity. In the meanwhile, the harmonizing process promotes the balanced regulation of the limbic system, enhancing health wellbeing.

ii) The Harmony of “muscle-tendon (jin) and bone (gu)”

The character jin 筋 refers to tendon, muscle, or veins, which in the context of the principle, turns out to aptly describe the muscle-tendon unit, the fundamental unit in the force transmission system of the body. There is a constant exchange between the active muscle forces and the passive tension of the tendons. The harmony principle expresses the balance of the interplay of forces in the MTU, namely, the harmony of jin and gu.

The internal balancing by the fangsong mechanism induces a restful state of the MTU. This maintains the MTU in balanced tension for the muscle contraction forces to transmit efficiently to the bone with minimal time lag.

Also, the balanced state at rest corresponds to the restful length of the myofibril. By the sliding filament theory, the sarcomere (the basic unit of myofibril) has a narrow length range from 2 microns to about 2.35 microns where the actin and myosin filaments overlap optimally, thus set to generate maximal force on activation. Thus, regulated by the harmony principle, the MTU is primed for action with the capacity of maximal strength.

In the thoracolumbar fascia, the fangsong mechanism of letting the structures settle in balance, uncannily sorts out the forces in harmony, switching back and forth between the passive fascial tension and the active muscle forces.[15]

iii) The Harmony of “Qi and force li”

Force transmission is a function of the momenta of body segments. The fangsong discipline works to align the momenta to ensure that the segments do not move out of kinetic sequence in whole-body motion. The harmony principle here refers to the alignment of momenta in the body motion and the Qi associated with it. The tensile forces of the interacting MTUs in the fangsong alignment of momenta are perceived via the fascial tensional network by Qi.

The issue of force here is not that of the tensile forces of the MTUs, which can only generate body motion, but the force that ensues when the motion is resisted, as when the fist and head collide. This force results from the rate of change of momentum (Newton’s Second Law of Motion). Thus, the larger the momentum generated by alignment, the greater the force potential in application. This force potential is a consequence of the aligned momenta in motion associated with Qi, namely, of the harmony and Qi and motion. In other words, the harmony of Qi and li-force encompasses the alignment of momenta and thus its force potential.

To sum-up, we find here the scientific rationale of the ideal Taiji motion as one inspired by balance and harmony in momenta of the body segments. In practice, this is the nurturing of Qi by fangsong tempering of motion.
guided by the Three Harmonies Principle to be in Yin-Yang balance, which embodies the functional state of better alignment and harmony. In physics, we see the ideal motion as giving rise to force that is engendered of aligned momenta, thus is of maximal force potential. As the resulting strength of this force does not appear to come from the visible muscle groups, but from internal discipline, it is dubbed Internal Strength or Neijin.

8. Neijin (内劲) or Internal Strength

Neijin is inspired by Yin-Yang balance but underlying it is the Three Harmonies Principle. It is the core strength developed in Taijiquan training by the fangsong settling of the body in balance and alignment, concomitant with the cultivation of Qi, summed up as the harmony of Qi and li. In short, neijin is li-force forged with Qi, aptly represented by the equation:

\[ \text{Neijin} = \text{Qi} + \text{Li-force}. \]

From the standpoint of biomechanics, the force of neijin is not just about strength, but of maneuverability to change in timeliness. Neijin ensues from body motion that is tempered by fangsong to be in accord with Yin-Yang principles, inspiring the body’s consummate balance and momentum alignment. Neijin is the source of the body’s versatility and maneuverability of martial potency. In an encounter, the body uncannily responds with the right force vector with timeliness.

To illustrate, when pushed, the common response is concentric in powering to prevent from being shoved. The response of neijin is not to push back, but to fangsong and guide the attacker’s incoming force vector. The act of fangsong settling (yin jin luo kong) of Chen Changxin’s Taijiquan Discourse to the opponent’s force pressure, generates the right punch as it is supported by the alignment of mo (立如枰准备) to the kua (沉则随). And the recoil of the stretched MTUs provides an initial boost of the jump phase.

This costly response is resolved by the mechanism of the stretch-shorten cycle which facilitates a pre-stretch in initiating an action [17]. For example, we drop our body in a squat before jumping. The dropping action stretches the tendons, priming the extensor MTUs to jump. Crucially, the extensor muscles are activated microseconds in eccentric contraction to help arrest the downward movement. When the downward movement ends, the same muscle contraction becomes concentric in powering the upward movement of the jump. Also, the recoil of the stretched MTUs provides an initial boost of the jump phase.

The response of the force vector is packed with the responsivity of the Principle of Six Advances (Liu jin) of Chen Changxin’s Ten Essential Principles, which is articulated as: To move left, must initiate at right (shang zuo bi jin you); to move right, must initiate at left (shang you bi jin zuo).

Indeed, the fangsong settling (song chen 松沉 ) of the body in balance turns out to serve as an ingenious neutral countermovement that gives rise to the liveliness of neijin’s response. The act of fangsong settling into balance constitutes a pre-stretch, priming the body in an ever-ready state of preparedness (li ru ping zhu bian bei 立如秤准备). Enconced in the state of balance, the response of “sinking and following” (pian chen ze sui 偏沉则随) to the opponent’s force pressure, generates the countermovement of the action of the right force vector. (The last two phrases are common practice dictum from the Taijiquan Discourse by Wang Zongyue).

The response of the force vector is packed with the right punch as it is supported by the alignment of momentum of the whole body motion, and transmitted from
the kua. This defines the distinction of the response of neijin, lively and timely of the right force vector in martial application.

Figure 2. The Three Harmonies of shoulder-kua, elbow-knee, and hand-foot in the Qi fascia tensional connectivity of the body.

9. Conclusions

Although we have explicated the role of Qi in generating the ideal Taijiquan motion in terms of physiology and biomechanics, the concept of Qi itself remains elusive to scientific definition and measurement. The Qi concept embodies a functional dimension—the operational effects of Yin-Yang balancing. The appreciation of Qi is based on our senses, but grounded on functionality of balance, which makes Qi very relatable to the body. Indeed, the very practice of the art of Qi nurturing forges a solution-path that leads to the harmony of the body’s functional entities.

To reiterate, the nurturing of Qi in Taijiquan, inspired by Yin-Yang balance, translates to the balancing and aligning of the body segments—the harmony of the system of interacting muscles, tendons, ligaments, and fascia via the fascial tensional network. The internal strength or neijin developed by Qi training is borne of body motion disciplined by the Yin-Yang principles. The gem of neijin is mined by the fangsong modality in the arduous kungfu process of mastering the art. Taijiquan’s martial potency is based on neijin, which gives rise to the lively and timely response of the right force vector in application.

However, while neijin may be fascinating in martial prowess, driving the popularity of Taijiquan is not neijin but the therapeutic health benefits that flow soon after from the practice. The immediate tangible beneficial effect is the confidence of one’s gait. The constant admonition of fangsong instills a body response of settling in balance at every turn and move. Crucially for an elderly, this response of settling is triggered in an accidental slip, helping to mitigate fall injuries. That Taijiquan is more effective in preventing falls compared to other exercise regimens, is well documented [18].

As fangsong is functionally modulating the muscles and fascia, very soon after taking up Taijiquan, practitioners begin to enjoy the therapeutic relief of chronic pains caused by poor body structures adopted habitually at work. Indeed, the fangsong settling of the body in balance is also manipulating fascial release to alleviate the causes of chronic pain syndrome.

The Principle of Wuzang (“Five Internal Organs”), another of the Ten Essential Principles, addresses the functional harmony of the system of internal organs, which are enveloped in fascial connective tissues. The permeating effects of Qi nurturing regulate the bioenergy dynamics of the organs in homeostasis, the passport to health. This benefit of health well-being accrues and is enjoyed daily throughout one’s Taiji journey [19].

The attentiveness in the slow-motion practice engages the mind beyond a physical activity; it puts one on a meditation path to the realm of spirituality (shen). The meditation component is enhanced further by the practice of standing in stationary postures (zhanzhuang 站桩) or by sitting meditation.

Figure 3. Sitting Meditation Eagle Flight Park, Cumberlad Cove, Monterrey, TN.
Of the mind, the insight of mindfulness operationally works to subdue the emotions of anger, hate, envy, greed, desire, and unwholesome thoughts that perturb and cloud the mind. This brings clarity and tranquility with the attendant health benefits of meditation. Thus we have the triple gems bestowed by Taijiquan: neijin, health, and equanimity.

Disclosure

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