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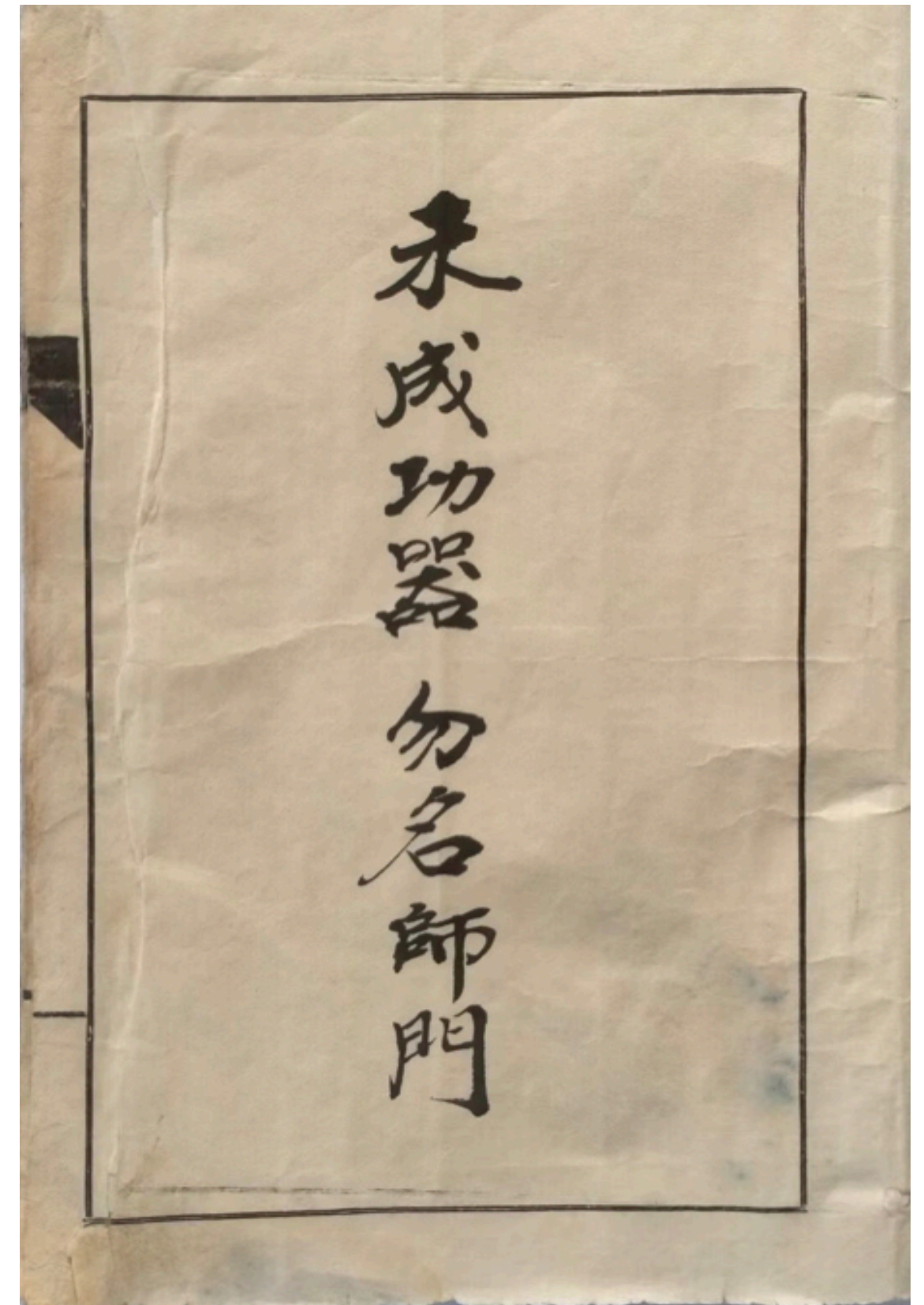
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The First Publicly Revealed Thirteen-Momentum Martial Arts Manual
(Qing Dynasty)



"Don't Claim to Be a Disciple until You Have Achieved Success", Inscribed inside cover of
Thirteen-Momentum Martial Arts Manual (未成功器、勿名師門).

Unraveling the Mystery Surrounding the Origins of Taijiquan by New Historical Materials in Tang Village, China

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Abstract—In this paper the recently recovered records of the Li family are discussed. These records answer many questions surrounding the start of taijiquan. This corrects many prior assumptions, and the documents reveal new insights into how various certain martial arts originally developed.

1. Introduction

For many years, there have been disputes over the origins of taijiquan; and there remained no consensus. The problem was, despite all the hard work and all the prior research by previous historians, it was very difficult to prove the source of taijiquan. This was due to the lack of credible historical records. As a result, all published conclusions seemed vague and the papers often lacked supporting evidence.

However, the situation has now changed. Recently, the Li family in Tang Village, which is in Boai County, Henan Province, China, uncovered some valuable historical documents, while they were updating their family's genealogy. Amongst these documents were the Li Family Genealogy, a Taiji Martial Arts Manual, and a Thirteen-Momentum Martial Arts Manual, which has previously not been published before. In this article, the authors, as both stakeholders and researchers, have carefully read through these three new historical materials and combined their contents with previously known local historical facts. Based on this new evidence, it is now believed that: (1) the Thirteen-Momentum techniques of taijiquan

originates from the Wuji Health-Preserving Martial Arts of the Thousand-Year Temple in Tang Village; thus, the birthplace of taijiquan is the Thousand-Year Temple; (2) Li Chunmao (the eighth generation of the Li family in Tang Village) was the first to standardize the inherited Wuji Health-Preserving Martial Arts in 1590, and he also created various documents (such as the Wuji Health-Preserving Boxing Treatise, Thirteen-Momentum Treatise, and the Song of Practicing Thirteen Momentums); (3) Li Zhong and Li Yan (the ninth generation of the Li family), and their cousin Chen Wangting (who was from the neighboring Chen Village), combined the Wuji Health-Preserving Martial Arts and Thirteen Momentums with the essence of other martial arts they found at the Thousand-Year Temple, to create the Taiji Health-Preserving Martial Arts; (4) Li Zhong created the document of Expositions of Insights into the Practice of Thirteen Momentums and Li Helin (from the 12th generation of the Li family) created various documents such as Taijiquan Treatise, Song of Push Hands, and the Essentials of Push Hands; (5) most of today's important Taijiquan Classics came from the Taiji Martial Arts Manual and Thirteen-Momentum Martial Arts Manual of the Tang Village; and (6) the two different sets of 58-posture routines of Wuji Health-Preserving Martial Arts and Taiji Health-Preserving Martial Arts significantly influenced the various postures found in subsequent traditional taijiquan styles.

Taijiquan is a martial art originating from China, and it is known for its unique

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combination of fitness, self-defense, and spiritual cultivation. Therefore, taijiquan is increasingly gaining attention and popularity. Its core philosophy is based on the ancient Taoist philosophical concepts of Wuji (無極) and Taiji (太極), and it is now widely accepted that through training in the concept of Wuji, one can achieve inner peace and tranquility; and nurture an endless flow of internal momentum in stillness. By practicing the concept of Taiji, one can also improve the body's flexibility and agility, and possess internal strength that maintains body balance and mind-body coordination.

It is often argued that understanding the origin and development of taijiquan is essential for comprehending this ancient martial art and also its underlying philosophical and cultural background. However, due to the lack of historical documentation, the origins of taijiquan has long been controversial and there are many different theories, most of which rely on anecdotes or indirect evidence. Thus, over the past century, scholars have concentrated on researching and examining historical figures such as Zhang Sanfeng (張三丰), Cheng Lingxi (程靈洗), Xu Xuanping (許宣平), Li Daozi (李道子), Wang Zongyue (王宗岳), and Chen Wangting (陳王庭), but no consensus had previously been reached.¹⁻³

When studying the history of objects and when seeking the truth surrounding history, surviving physical evidence is the most trustworthy source, while new sources of information should be used with caution. In this line of thought, in the early years of the 21st century, valuable collections of historical materials were unearthed at Tang Village (唐村), in Boai County (博愛縣), Henan Province, China. These documents included the Li Family Genealogy (李氏家譜) which was compiled in 1716, the Taiji Martial Arts Manual (太極拳譜) collected by Li Lichao (李立潮), and the Thirteen-Momentum Martial Arts Manual (十三勢拳譜) collected by Li Qunfeng (李群峰), which together provide three authoritative pieces of physical evidence to unravel the mysterious origins of taijiquan. This article examines and interprets these historical materials, to overcome the long-standing confusion that

has surrounded the history of taijiquan, and to help pave the way for new areas for future exploration. However, despite this being an extended article on these documents, due to the substantial amount of information that has been recovered, this article can only begin to introduce the most important contents of the Tang Village materials and to present a few representative photocopied images (see Fig. 1 to 20).

2. Interpretation of the Li Family Genealogy

2-1. Discovery and Contents of the Li Family Genealogy

China has long had the custom of compiling genealogies during prosperous times. In 2002, the leader of the Li family in Tang Village decided to update its genealogy, which had, after many years of turmoil, become scattered and misplaced. It was during the search through their belongings that various historical genealogy records, contracts, inscriptions, martial arts manuscripts, and other historical artifacts were uncovered.

Specifically, during the Qingming Festival in 2003, Li Libing (who is a co-author of this article, and was responsible for updating the Li Family Genealogy) learned by chance that Li Taicun had moved to Xian (西安) in 1947, and that he had a copy of the existing family genealogy. Li Libing immediately organized a team to investigate this by traveling to Xian. There the team met the current guardian of the genealogy, an old lady named Wang Guiying. This genealogy is a version that was transcribed by someone entrusted by Li Taicun, before he had moved to Xian, but he disappeared in 1953. His wife Wang Guiying, who was illiterate, would place the family genealogy on the table for worship during every festival to express grief, and thus the genealogy survived. When the search team explained their purpose, the old lady only agreed to let them take photos, or to copy the genealogy, but declined to hand it over for preservation, in the ancestral hall.⁴

The facts surrounding this matter is that the owner of the Li Family Genealogy was an

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illiterate elderly person, with no ability and apparently no motivation to modify or fabricate information. The surviving copy of the Li Family Genealogy that we see today was written on a pale-yellow ledger paper with a rough edge. According to local elders, this type of ledger paper was widely used by merchants in the Huaiqing area of Henan Province during the late Qing Dynasty (清朝) and early Republic of China periods. In fact, it was common amongst some families to transcribe martial arts manuals and similar materials onto cheaper and more easily accessible ledger papers. This is why ancient manual materials copied onto ledger papers continue to be discovered in some local areas.⁴

The Li Family Genealogy consists of nine parts: (1) Preface of the Li Family Genealogy; (2) Family Precepts and Poems; (3) Generational Names; (4) Old and New Gravesites and the Direction They Face; (5) Migration Records of the Ancestor; (6) Genealogy of the First to 12th Generations; (7) Wuji Health-Preserving Boxing Treatise (无极养生拳论), Song of Practicing Thirteen Momentums (十三势行功歌), and Taiji Health-Preserving Martial Arts Manual (太极养生功谱); (8) Biographies of Successful Exam Candidates and Scholars; and (9) Epilogue. The length of the genealogy, as it currently exists, is 25 pages. Fortunately, the Wuji Health-Preserving Boxing Treatise and the preceding contents are well-preserved. However, only half a page of the essay: Song of Practicing Thirteen Momentums remains. The five or six pages of the Taiji Health-Preserving Martial Arts (HPMA) Manual, the Biographies of Successful Candidates in the Imperial Examination, and the Epilogue were either damaged or lost.⁵

It appears that this genealogy and collection of martial arts notes was compiled in the 55th year of the Kangxi (康熙) Emperor's reign (1716). The compiler, Li Yuanshan (李元善), introduced the genealogy in the preface, stating that it was first compiled by his fifth-generation ancestor, whose name was Mingdao, and then later by his seventh-generation ancestor, whose name was Mingde.

He then stated that he, Li Yuanshan, was now compiling it again as the elder of the tenth generation. Li Yuanshan also introduced the origin of the Li family in Tang Village, stating that the founding ancestor, named Qingjiang, came from Fenghuang Village (凤凰村) in Hongdong County (洪洞县), Shanxi Province in the fourth year of the Hongwu (洪武) Emperor's reign (1371). Li Qingjiang then settled in Tang Village, Huaiqing Prefecture in Henan Province, and it has been over 340 years since then, with 12 generations of descendants recorded. Li Yuanshan then gave a brief account of the accomplishments and virtues of the Li family throughout the preceding generations and ended with a personal commitment to the family: "By compiling this genealogy and respecting the ancestral virtues, I hope to perpetuate the Li family's achievements and virtues, and to elevate our family's status". The preface then ends with Li Yuanshan's signature: "Tenth generation Yuanshan respectfully compiled this genealogy".^{6,7} Overall, the genealogy records a family history of 345 years, from 1371 to 1716.

2-2. A Successful Family Excelled in Both Literature and Martial Arts Pursuits

The Li Family Genealogy records a total of 123 male members from the first generation to the 12th generation. Amongst them 74 individuals practiced a dual education in literature and martial arts, and 26 were professional martial artists. Starting from the fifth generation Li Mingdao, 66 individuals traveled to various provinces and cities (such as Shandong, Shanxi, Zhejiang, Hubei, Beijing, and Henan) to teach martial arts. It is recorded that the martial arts they taught and propagated in these regions included Wuji Health-Preserving Martial Arts (HPMA) (无极养生功), Wuji boxing, Thirteen-Momentum martial arts, Taiji HPMA, Tongbei (通背) martial arts, Xinyi (心意) boxing, Liuhe (六合) spear, sword, spear, arrow, and other martial arts. For instance, the eighth-generation martial artist Li Ziqi (李自奇) was recorded in the family genealogy to have taught boxing in Shanxi and Shaanxi Provinces during the Chongzhen (崇祯) era. The discovery of Li



Fig. 1. Image of the cover of the Li Family Genealogy.

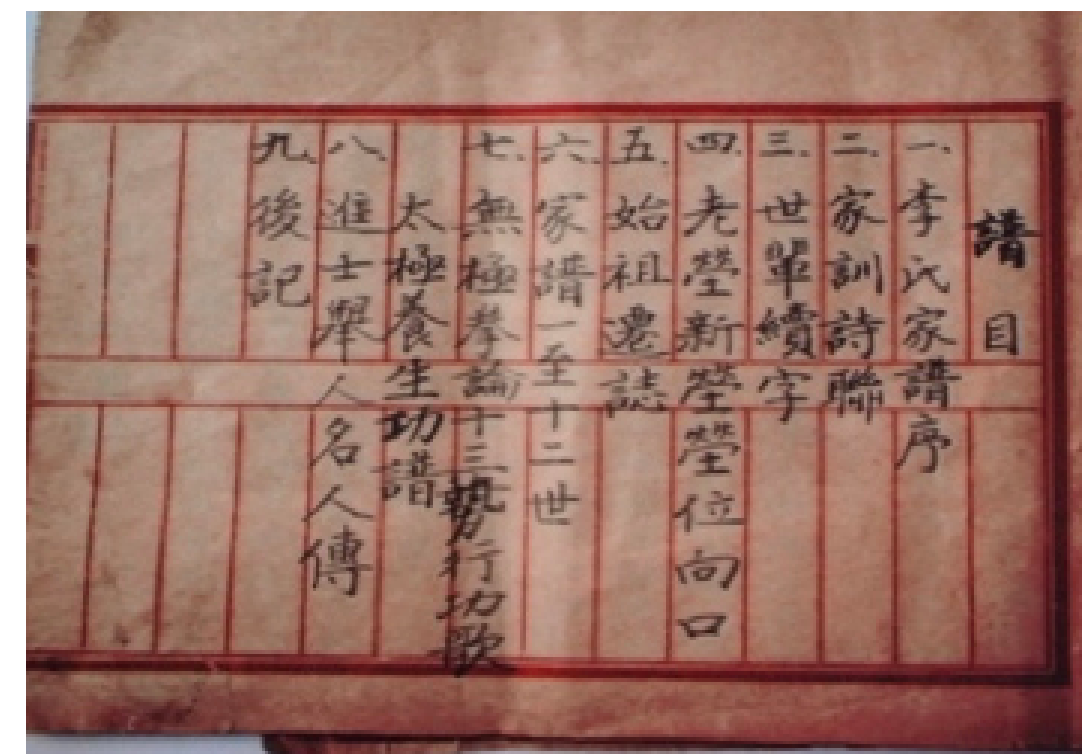


Fig. 2. The Catalogue of Li Family Genealogy.

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Ziqi's tombstone inscription further confirms the authenticity of the family genealogy, which recorded him as a master of Xinyi boxing and Liuhe spear who had traveled and taught in Shanxi and Shaanxi Provinces.^{8,9}

In the Li family Genealogy, in the year 1640 there were ten individuals appointed as generals by the peasant uprising leader Li Zicheng (李自成) due to their exceptional martial arts skills. Among them were five brothers, Li Mou, Li Zhong (李仲), Li Xin (李信) (also known as Li Yan (李岩)), Li You, and Li Dong of the ninth generation. They made remarkable achievements, and Li Dong sacrificed his life on the battlefield. However, Li Mou and Li Yan were executed by Li Zicheng due to internal conflict within the rebel army. The surviving two brothers were Li You and Li Zhong. Li You hid in Xunzhang Village, Jiyuan City, Henan Province, and wrote a book called Divine-Fist Martial Arts Manual (神拳拳谱); and, to avoid being pursued by the Qing government, Li Zhong fled to his younger brother Li Jun's bookstore in Zhejiang Province and taught martial arts for a living. He then trained his five sons, all of whom became famous martial arts masters, amongst these was his fourth son, Li Yuanshan, who was involved in compiling the family genealogy.

Due to this historical context, Li Yuanshan specifically reminded his relatives during the genealogy compilation process to uphold the family's honor and reputation, to recognize the importance of current affairs and to abide the right path. He also recorded the important instructions of the family patriarch, who warned that during the late Ming Dynasty (明朝), several ninth-generation family members were lured into the service of the rebel leader and were sacrificed. Thus, he urged caution in discussing and circulating the genealogy.

Li Yuanshan, the son of Li Zhong, was a scholar and the nephew of Li Yan. Therefore, it can easily be imagined that recording the names and the deeds of these two elders in a genealogy compilation carried a significant risk, as it could potentially draw unwanted attention and great danger to both the

compiler and to the family members who owned the genealogy.

As a result, it would appear neither the compiler nor the family members who held the genealogy had any motive to fabricate or alter its contents for personal gain.^{10,11}

2-3. Three Young Men Who Created Taijiquan

The Li Family Genealogy also clearly records that taijiquan was created, jointly, by Li Zhong, Li Yan, and Chen Wangting. At that time, the founding ancestors of the Li family (two brothers of Li Qingjiang and Li Qinghe), along with the founding ancestor of the Chen family from Chen Village (Chen Bu), the founding ancestor of the Haozhuang village (Chen Hou), and the founding ancestor of the Liu village (Jiang Peili); all migrants from Hongdong, gathered at the Thousand-Year Temple in Boai County to worship and made a solemn oath. There they also planted trees to commemorate the occasion.

From then on, the various families maintained close ties with each other through intermarriage. Chen Wangting's mother was the aunt of Li Zhong and Li Yan. The three cousins shared a love of literature and martial arts; had a deep sense of loyalty; and went to the Thousand-Year Temple to learn martial arts from the same masters, and together they created the Taiji HPMA (太极养生功), which is the earliest known version of taijiquan.^{5,12,13}

Within the Li Family Genealogy records there are three instances where it is mentioned that the three cousins created taijiquan: the first instance is recorded in the Preface of the genealogy, which states: "The ninth-generation ancestors, named Zhong and Xin, joined with their cousin Chen Wangting (also known as Chen Zouting (陈奏庭)) of the Chen Village to become sworn brothers at the Taiji Gate. They established a legacy of martial and literary excellence and created the Taiji HPMA. They also practiced the inherited Wuji martial arts, Thirteen-Momentum martial arts, and Tongbei martial arts".^{5,14}

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Fig. 3. The preface of Lee Family Genealogy.

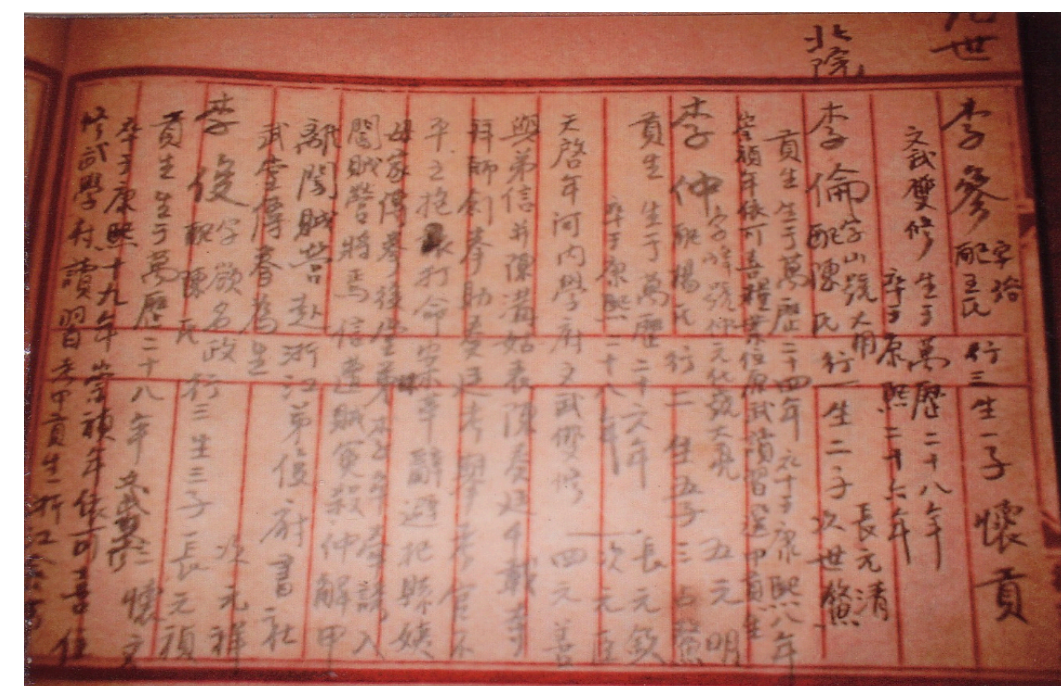


Fig. 4. A section of Li Zhong in Li Family Genealogy.

The second record is an entry for Li Zhong in the genealogy: “Li Zhong, also known as Feng and Zhongyuan, was nicknamed Daliang. He was born in the 26th year of the Wanli (万历) reign (1598) and died in the 28th year of the Kangxi reign (1689). During the Tianqi (天启) reign, he studied both literature and martial arts at the Hanoi Academy (河内学府). Along with his younger brother Li Xin and his cousin Chen Wangting, they went to the Thousand-Year Temple to study martial arts and created taijiquan. He also assisted Chen Wangting in beating up an unfair examiner; and as a result, they were banned and punished. This incident led them to flee to their aunt's home in Qi County, where they continued to practice and teach martial arts. However, they were lured into the rebel army by brother Li Mou to become generals. Later, brother Li Xin was unjustly killed while Li Zhong managed to escape from the rebel camp. Afterwards, Li Zhong went to Zhejiang Province and taught martial arts at his younger brother Li Jun's bookstore”.^{5,15}

The third record in the Li Family Genealogy states: “Li Xin, with the courtesy name Yan and given name Wei. He was born in the 34th year of the Wanli reign (1606) and died in the 17th year of the Chongzhen reign (1644). In his youth, he studied under his father in Jiyuan, and later became sworn brothers with his elder brother Li Zhong and his cousin Chen Wangting after studying at Three Sages Gate (三圣门), Taiji Palace (太极宫), and Thousand-Year Temple (千载寺). He excelled in both literature and martial arts and achieved fame through his skills. He co-founded the Taiji HPMA, practiced the Thirteen-Momentum martial arts, swordplay, and archery, and his reputation spread throughout several provinces. He assisted Chen Wangting in beating up an unfair examiner but was forced to flee to his aunt's home in Qi County, Kaifeng City to avoid retribution. He continued to practice martial arts, and later worked for his uncle Chunyu, who was a grain merchant, and helped to provide relief during a famine. During a crisis, the grain business failed, and he returned to the Thousand-Year Temple to resume practicing martial arts. In the 13th year of the Chongzhen reign (1640), his

cousin Li Mou lured him into the camp of the rebel army, where he was killed in the 17th year of the Chongzhen reign (1644)”.^{5,16}

The records in the Li Family Genealogy also provide historical evidence for the creation of taijiquan by the three cousins. “Taiji HPMA” was the initial name of taijiquan at the time when it was created. Although the genealogy does not provide a year for the creation of taijiquan, it is, from these records, certain that it was created before the three cousins separated. The genealogy describes Chen Wangting's participation in the martial arts exam in Huaiqing Prefecture, Henan Province, and how the three cousins killed an official in anger because the chief examiner was unfair. After that incident, they went their separate ways and never met again. According to the Huaiqing Prefecture Annals (怀庆府志), the civil unrest during the Chongzhen years of the imperial examination occurred during the Bingzi (丙子) year, so it can be inferred that the three cousins created taijiquan before the year 1636, which is approximately 400 years ago. The Li Family Genealogy records that Li Zhong, Li Yan, and Chen Wangting jointly created taijiquan. There are also tangible materials such as cultural relics and martial arts manuscripts from the Tang Village Martial Arts Academy that can also serve as evidence. More detailed description is provided in later sections regarding the Taiji HPMA.^{5,17}

2-4. Three Important Literatures on Taijiquan

The seventh volume of the Li Family Genealogy catalogues three important treatises on taijiquan - “Wuji Health-Preserving Boxing Treatise, Song of Practicing Thirteen Momentums, and Taiji HPMA Manual”.^{5,18}

Wuji Health-Preserving Boxing Treatise is a martial arts treatise that is full of dialectical reasoning on health preservation. Its main point is to “grasp the Yin and Yang, seize the transformation of creation, turn the universe, twist the energy mechanism, return to the prenatal in the postnatal, and return to the source to achieve Taiji integration, which is

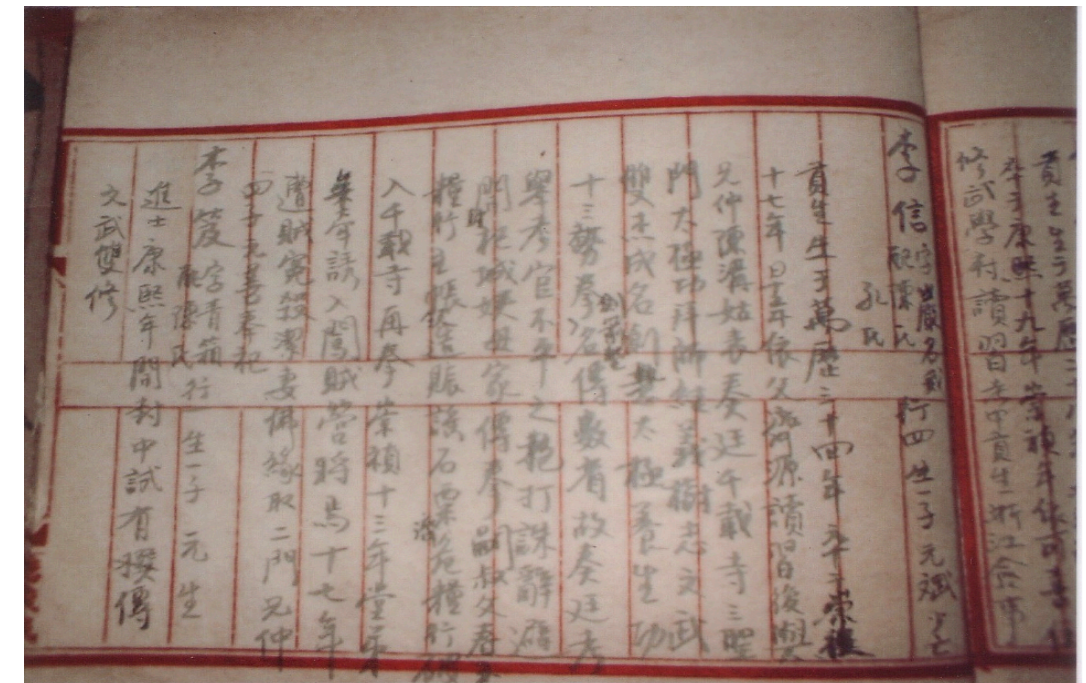


Fig. 5. Section of Li Xin (a.k.a. Li Yan) in Li Family Genealogy.

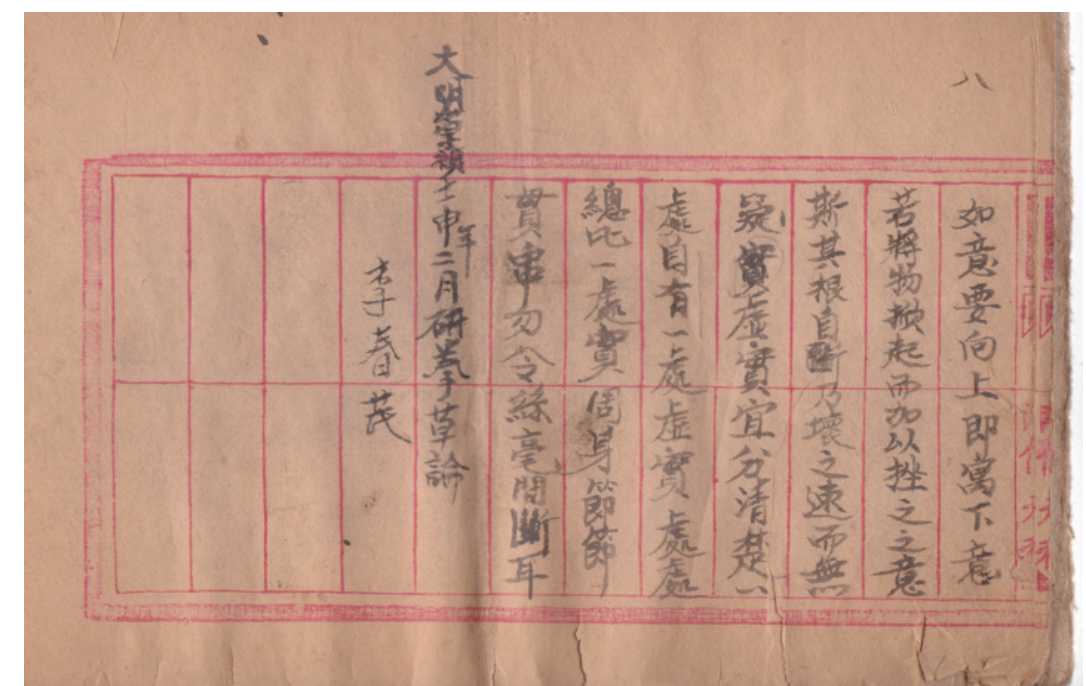


Fig. 6. Li Chunmao's Thirteen-Momentum Treatise, inscribed in the Ming Dynasty, Feb 1632.

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essentially to reach the goal of eternal life”. It is indicated at the end of the manuscript that the author, Li Yezhen (李叶蓁) (also known as Li Chunmao (李春茂)) who is the eighth-generation ancestor of the Li family, presented the treatise at the Taishi Shrine (太室祠) in the year of Gengyin (1590) during the Wanli period of the Ming Dynasty. This text appeared in the book: “A Study of Xingyi Boxing (形意拳学)” by Sun Lutang (孙禄堂), the founder of Sun-style taijiquan, but its original source was not indicated.^{5,19}

The document: “Song of Practicing Thirteen Momentums” is also attributed to Li Chunmao, which was written in the spring of the year of Gengyin (庚寅) (1590) during the Wanli period of the Ming Dynasty. This text appeared in the Taijiquan Classics copied by Wu Yuxiang (武禹襄) and was subsequently included in the Taijiquan Classics of the Wu-Hao (武), Yang (杨), and Wu (吴) families. However, it was generally believed, within the academic society, that this text was written by Wang Zongyue during the Qianlong (乾隆) period of the Qing Dynasty.^{5,20}

Li Chunmao, the author of the two aforementioned treatises, was an important figure in the martial arts inheritance of the Li family. “The preface to Li Family Genealogy records: “The eighth-generation ancestor Li Chunmao, who used the nickname Li Yezhen, passed the imperial examination and then studied under the Abbot Bogong (博公道长) in the Thousand-Year Temple, Three Sages Gate, and Taiji Palace. He learned martial arts and swordsmanship, observed astrology, studied military strategies, promoted the unity of the three religions, and discussed the Wujia HPMA and Thirteen-Momentum martial arts. He also created the arts of spear and was renowned for his divine skills. He traveled to teach and spread martial arts in several provinces including Shanxi, Shandong, Shaanxi, Zhejiang, Hunan, and Guangdong, and was well-known”.^{5,21}

Therefore, it can be affirmed that Li Chunmao was not only the guide for the three young cousins who studied at Thousand-Year Temple, but also in a way the

beacon light that inspired the creation of taijiquan through his publications of Wuji Health Preserving Boxing Treatise and Song of Practicing Thirteen Momentums.

It should be noted that the existing Li Family Genealogy is damaged and the sections after the phrase “prolong life and delay aging” in the essay “Song of Practicing Thirteen Momentums” are missing. It is regrettable that the remaining few pages are missing, as this results in the loss of the conclusion of this document and the entire text of Taiji HPMA Manual. More fortunately, the missing “Song of Practicing Thirteen Momentums and Taiji HPMA Manual” have been rediscovered in the Thirteen-Momentum Martial Arts Manual, which was found in 2020. To recover the three martial arts documents in the genealogy is truly fortunate, amidst all the other misfortune.

The Taiji HPMA Manual is an important document, and it includes ten chapters: “Preface, Sacred Origins, Martial Arts Principles, Martial Arts Naming, Martial Arts Execution, Body Positions, Martial Arts Foundation, Internal Cultivation, External Defense, and Martial Arts Treatises”. Every chapter consists of an eight-line pentameter verse. The following are sample excerpts from seven of the chapters.²²

Preface -- In the spring of the year Jiayu (甲戌) (1634) during the Chongzhen reign, three cousins worshiped the three religions of Confucianism, Buddhism, and Taoism at a religious event held at the Thousand-Year Temple. At the Taiji Palace there, the two brothers, Li Zhong and Li Xin (a.k.a. Li Yan), and their cousin Chen Zouting (a.k.a. Chen Wangting) learned martial arts under Abbot Bogong.

Martial Arts Naming -- Taiji HPMA named after the Wuji Martial Arts; Thirteen Momentums of Long Boxing; Eight Methods and Five Steps; Cardinal directions of Kan (坎), Li (离), Zhen (震), and Dui (兑); Ordinal directions of Qian (乾), Kun (坤), Gen (艮), and Xun (巽); Five Elements of Metal, Water, Wood, Fire, and Earth; Eight Trigrams corresponding to the Five Elements.

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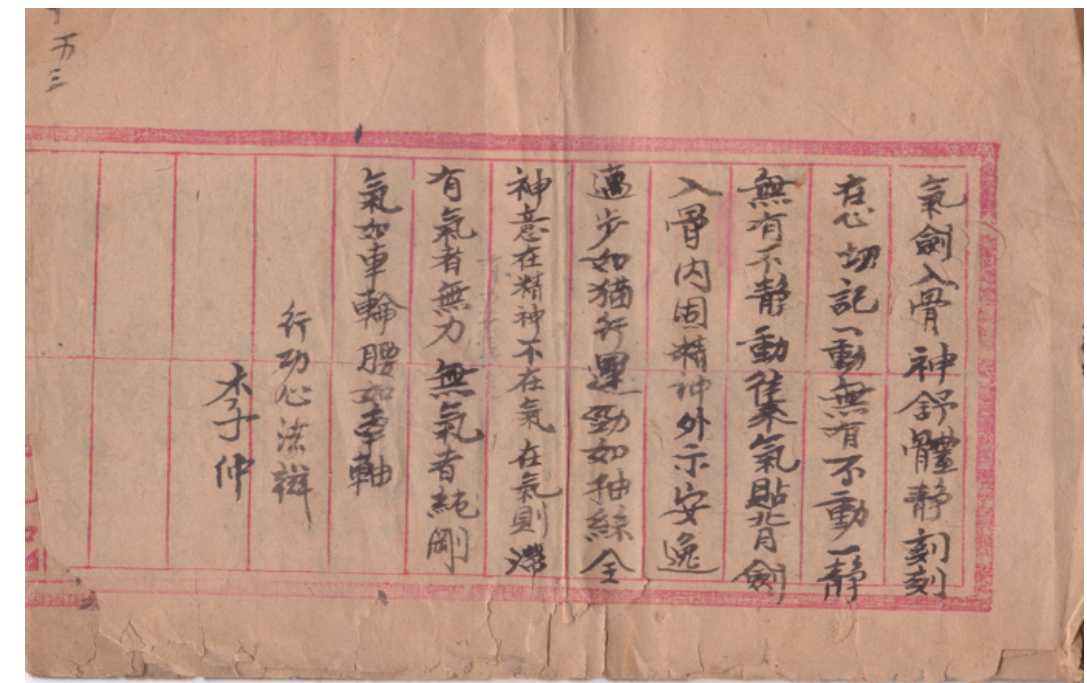


Fig. 7. Li Zhong's “Expositions of Insights into the Practice of the Thirteen Momentums”, inscribed before 1636.

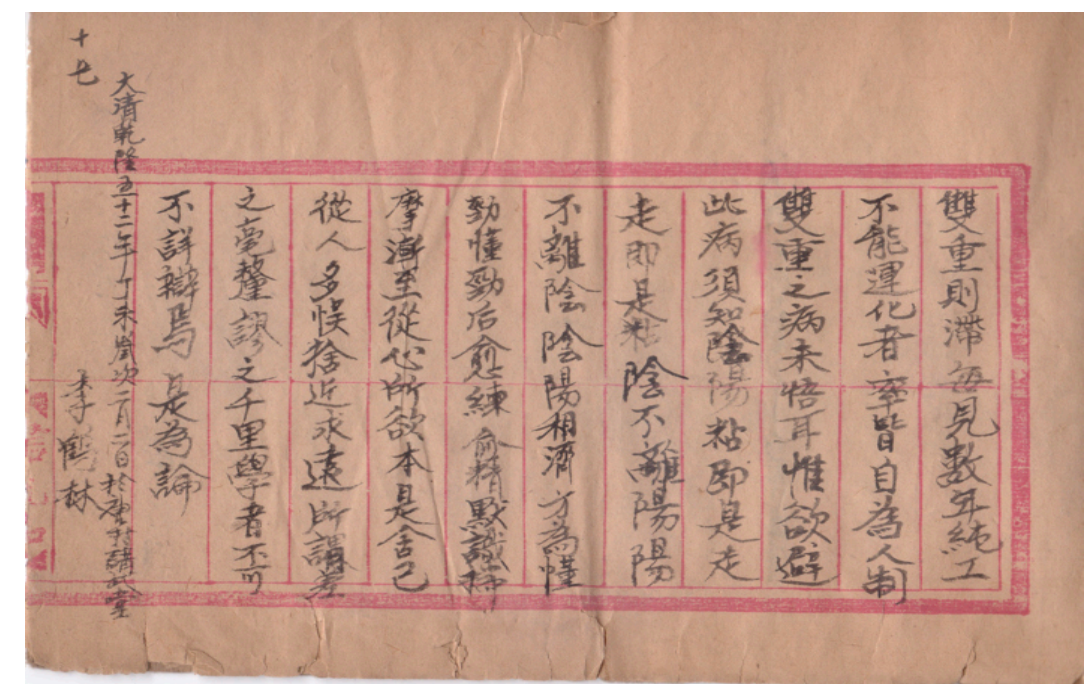


Fig. 8. Li Helin's “Taijiquan Treatise”, inscribed in Qing Dynasty, Feb 1787.

Martial Arts Execution -- Acting in Ward-off, Roll-back, Press, and Push; Proceeding through Push; Pluck, Split, Elbow Strike, and Shoulder Strike; Central Equilibrium during Forward, Backward, Look-left, and Look-right; All actions executed through these Thirteen Momentums; Momentums implemented as rolling a ball; Strength motivated as reeling the silk; Momentums progressing like a river; Actions still as a mountain.

Body Positions -- Standing upright and centered; Momentums supported in all eight directions; Waist and spine act as a wheel axle; Four limbs moved like wheel spokes; Spirit like a cat catching a mouse; Posture like a swan catching a rabbit; Walking like a cat; Upper and lower body integrated together.

Martial Arts Foundation -- The foundation of martial arts lies in the mind and intention, while the abilities are enhanced through the circulation of energy. The essence of performances lies in refining one's practice, while the spirituality lies in the skillful use of energy. The root of supremacy lies in the legs and feet, while the strength is expressed through the elbows. The flow of energy is expressed through the fingertips, while the cultivation of energy settles deep in the Dantian (丹田).

Internal Cultivation -- Attaining the utmost subtlety of the innate, the body is the foundation of harmony. Circulating energy through the mind and intention, and using energy and blood to nourish the body. Relaxing the abdomen and gathering the energy into the bones, and always keep in mind to retain a comfortable spirit and tranquil body. Expanding and stretching to seek compactness, and being lively and rounded in the sense of enjoyment.

External Defense -- Using softness to overcome rigidity, and yielding oneself to follow others. When the opponent is hard, I am soft and yielding; when the opponent retreats, I follow and stick. Not to initiate action, but rather responding to the opponent's move. Not to advance, but to retreat. Leading the opponent into emptiness,

and making them lose balance with minimum effort.

At the end of the Taiji HPMa Manual, it is noted that Li Zhong, Li Xin (a.k.a. Li Yan), and Chen Zouting (a.k.a. Chen Wangting) studied martial arts at the Taiji Palace and compiled this manual at a religious event held at the Taiji Palace, Three Sages Shrine, and Thousand-Year Temple on the second day of the second lunar month in the seventh year of Chongzhen reign (in the year 1634) of the Ming dynasty.

These historical materials thus credibly prove that the emergence of Taiji HPMa marked the birth of taijiquan. It was created by three young martial artists, Li Zhong, Li Yan, and Chen Wangting, based on the Wuji HPMa along with other martial arts passed down in Thousand-Year Temple. They inherited, developed, maintained, and innovated these martial arts, and created the new martial art, which we now call taijiquan; and it occurred in 1634 at the Thousand-Year Temple.

3. A Short Introduction to The Thousand-Year Temple

3-1. Historical Evolution of The Thousand-Year Temple

The Thousand-Year Temple is in the north of Tang Village, Boai County, Henan Province. It was first built in the tenth year of the Yongping period (67 AD) of the Eastern Han Dynasty and was originally named Wuji Temple. The Northern Wei Zenghui Statue Carving Stele (北魏僧惠造像碑) remained at the present site of the temple, refers to it as the "Hometown of Wuji". Thousand-Year Temple is a place where Confucianism, Buddhism, and Taoism are integrated, and is divided into three temples: Thousand-Year Temple, Three Sages Gate, and Taiji Palace. The Buddha, King Wen (文王) of Zhou Dynasty, Confucius, Yin Shouzhi (尹寿子), and Laozi were all enshrined here, reflecting the characteristic inclusiveness of Chinese culture.²³

The decline of the Thousand-Year Temple began in the early Qing Dynasty when

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Fig. 9. Cover of Thirteen-Momentum Martial Arts Manual.

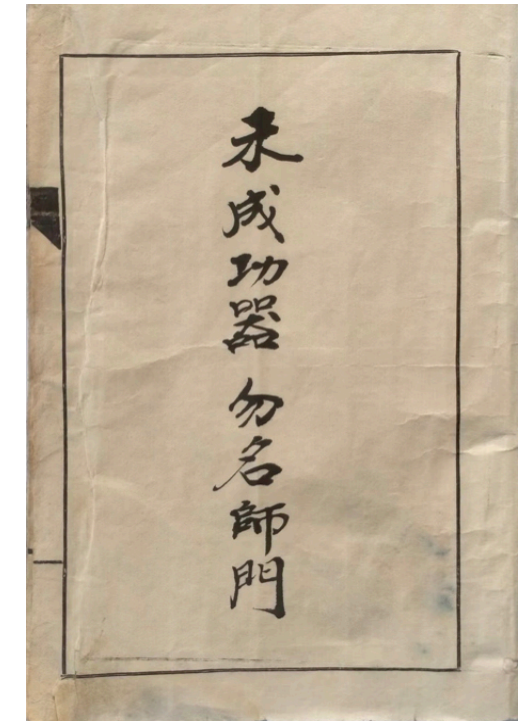


Fig. 10. "Don't Claim to Be a Disciple until You Have Achieved Success", Inscribed inside cover of Thirteen-Momentum Martial Arts Manual.

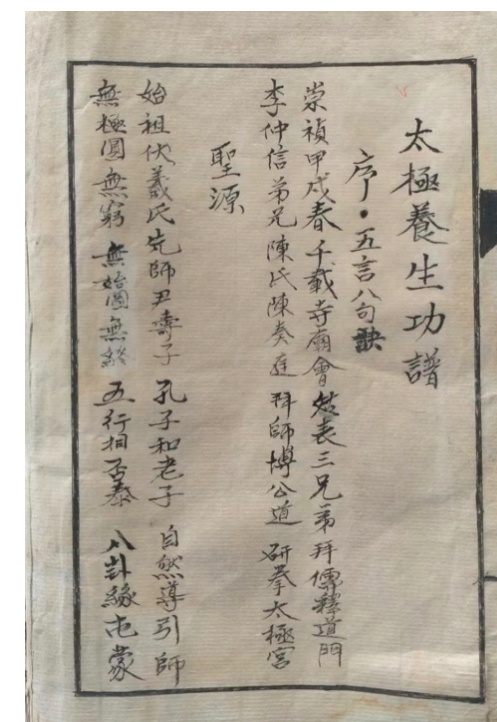


Fig. 11. Taiji HPMa Manual Created by Li Zhong, Li Xin, and Chen Wangting in 1634 (First Page).

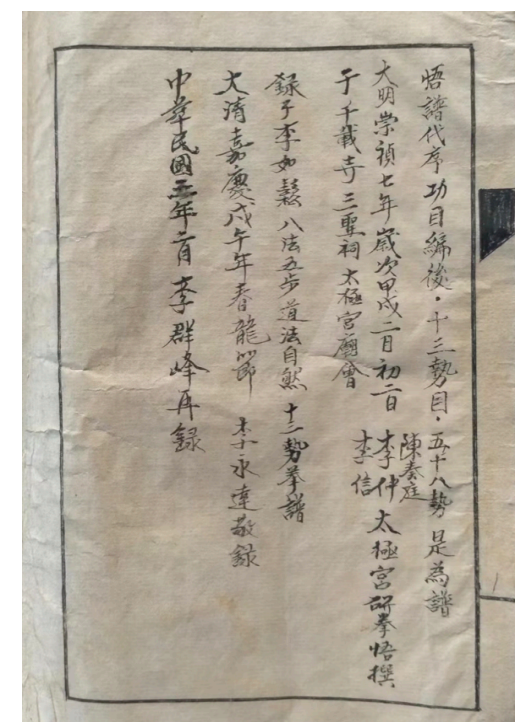


Fig. 12. Taiji HPMa Manual Created by Li Zhong, Li Xin, and Chen Wangting in 1634 (Last Page).

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officials and soldiers set fire to the temple, claiming that it harbored rebels. The fire caused significant damage; and in 1958, during the construction of a water conservancy project, most of the temple was demolished.

3-2. The Cradle of Health-Preserving Culture

Since its founding, the Thousand-Year Temple has been known for its Taoist health preservation practice, called Guiding and Nourishing Art (导引养生术). This was created and passed down by Li Ziran (李自然) of Longevity Temple (万寿观) on Jinshan Mountain (金伞山) in the Former Han Dynasty (前汉朝) (before 25 AD).

In the early Tang Dynasty, the Wuji HPMa was created by Li Daozi, the abbot of the Thousand-Year Temple. According to the Ten Powers of Tang Monk Stele (千载寺唐僧十力传碑) at the Thousand-Year Temple during the Kangxi period of the Qing Dynasty, Li Shimin (李世民) (also known as Emperor Taizong of Tang) gave him the surname Li, the name Ru, the alias Shi Li, and the title of Ten Powers Monk. Li Daozi was from Henei (which is present-day Qinyang City, Boai County, Henan Province) and he was a diligent learner who read extensively from the classics of the three religions. The stele states that he was “clever from a young age, with a photographic memory, and he studied extensively; in literature, martial arts, medicine, and divination.” His creation of the Wuji HPMa was very famous in the martial arts community at that time.^{15,23}

Li Daozi traveled extensively throughout his life and returned to his hometown in his later years to teach his disciples. He demanded of his disciples that: “The teachings of the three religions must be righteous, and strict martial arts discipline must be observed. Do not be arrogant or corrupt; everything should be done for the benefit of the people. Use softness to overcome rigidity and give up the self for others. Do not call yourself a master until you have achieved great success”. It can be said that Li Daozi's creation of the Wuji HPMa laid the foundation for the

development of the Thirteen-Momentum Martial Arts and Taiji HPMa.²³

3-3. The Place Where Chinese Martial Arts Was Inherited

The Merit Stele of Hongdong Migrants Giving Alms (千载寺舍善洪洞移民功德碑) at the Thousand-Year Temple was erected in 1593 by the descendants of migrants who settled on both sides of the Yellow River in Hongdong County and they paid tribute to Thousand-Year Temple, thanking the Buddhist and Taoist masters who had provided them food and taught martial arts in the past. It bears witness to the continuous inheritance of martial arts at the Thousand-Year Temple.

In the cradle of the Thousand-Year Temple, many skilled Taoist martial artists emerged and they made many outstanding contributions to the inheritance of martial arts. Amongst them was Li Chunmao who studied under Abbot Bogong, at the Thousand-Year Temple. Dong Bingqian (董秉乾) was another martial artist at the Thousand-Year Temple during the same period. According to the Preface to the Spear Manual of Wangbao (王堡枪传流序), the Wangbao spear was first passed down to our Wang clan ancestor Duke Zhongjin. He learned the spear technique from the wise man Dong Bingqian, who was from the Taoist Taiji Palace of Thousand-Year Temple. The old man had mastered various martial arts, including boxing, spear, and cudgel techniques. His boxing was the soft-hand Thirteen Momentums, and his spear and cudgel were the Liuhe spear and cudgel. He was knowledgeable in Yin-Yang, military strategy, and medicine. He passed his extraordinary skills to Duke Zhongjin, who diligently practiced and became skillful, and passed them down through many generations”.^{24,25}

These documents prove the inheritance place of the culture of martial arts and health preservation in the central part of China was at the Thousand-Year Temple, and the Tang Village historical records now confirm that the Thousand-Year Temple is indeed the birthplace of Taijiquan.²⁶

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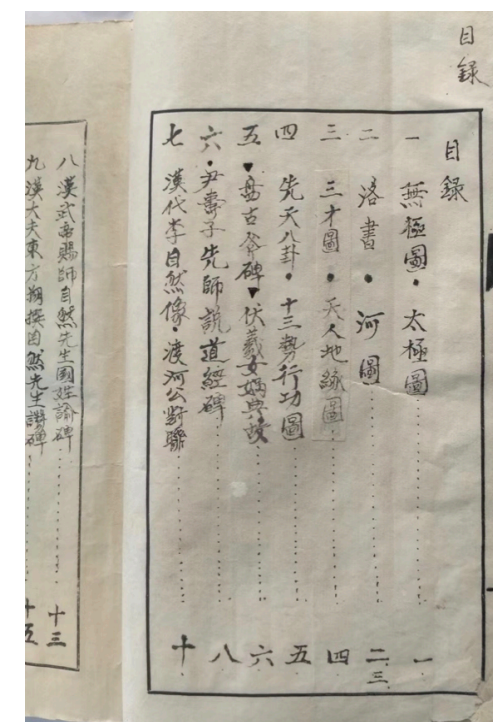


Fig. 13. Catalogue of Thirteen-Momentum Martial Arts Manual (First Page).

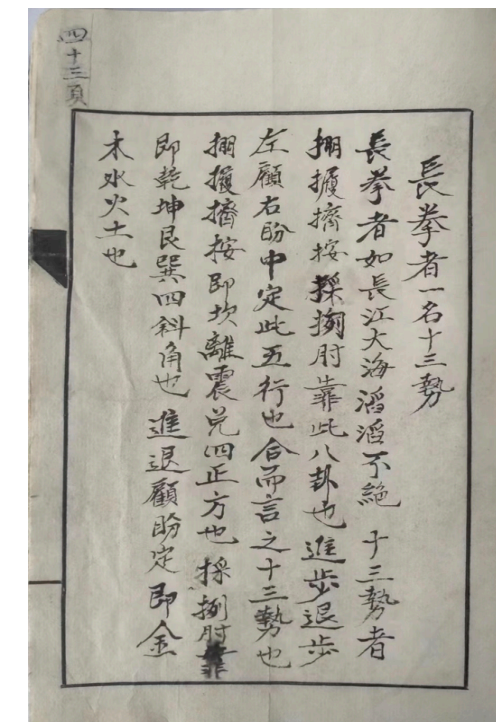


Fig. 14. Essay of Long Boxing. Also Known as Thirteen Momentums in Thirteen-Momentum Martial Arts Manual.

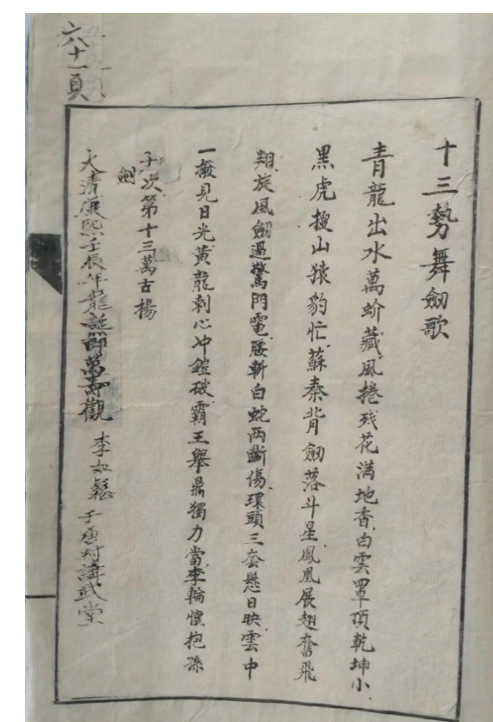


Fig. 15. Song of Practicing Thirteen-Momentum Sword. Created by Li Rusong at Lecture Hall of Tang Village in Feb. 1632.

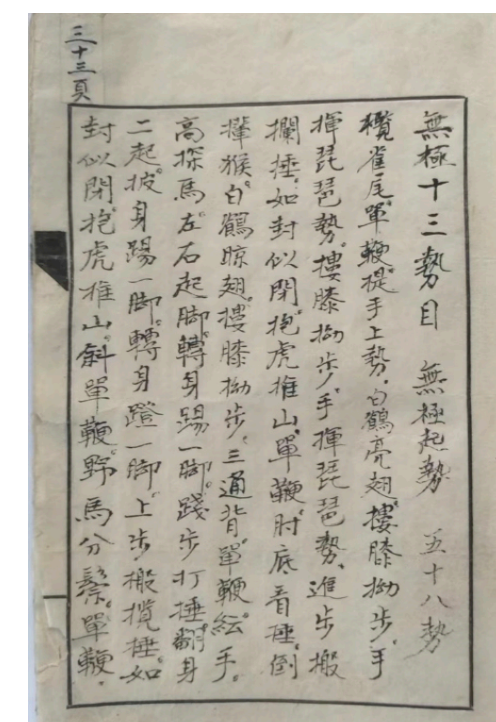


Fig. 16. 58-Posture Routine Created by Li Chunmao in 1590 for Thirteen Momentums of Wuji HPMa (First Page).

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4. Translation of Tang Village's Taiji Martial Arts Manual and Thirteen-Momentum Martial Arts Manual

4-1. Collection of Martial Arts Materials in Tang Village

To further update the family genealogy, the head of the Li family in Tang Village mobilized people of all ages to collect all surviving martial arts literature and historical materials related to the family's genealogy. The collected martial arts materials were classified into four categories. The first category included traditional martial arts manuals and spear manuals (including the Taiji Martial Arts Manual and Liuhe Spear Manual collected by Li Lichao, Thirteen-Momentum Martial Arts Manual collected by Li Qunfeng, and the Profound Techniques of Martial Arts (武经玄机) collected by Li Chenghu). The second category included surviving stone inscriptions from the Thousand-Year Temple. The third category included stone carvings on the tombstones of martial arts practitioners. The fourth category included stone inscriptions from Longevity Temple on Jinsan Mountain and the academic document: "Eight Methods, Five Steps, and the Natural Way of Taoism (八法五步、道法自然)" by the abbot of Longevity Temple, Li Rusong (李如松), who was from the 11th generation of the Li family. This academic document is a theoretical essay explaining the Taiji HPMa technique. Among the materials mentioned above, the most remarkable documents are the Taiji Martial Arts Manual collected by Li Lichao and the Thirteen-Momentum Martial Arts Manual collected by Li Qunfeng.^{15,22,27}

4-2. Discovery and Content of the Taiji Martial Arts Manual Collected by Li Lichao in Tang Village

The Taiji Martial Arts Manual of Tang Village was provided by Li Lichao who was from the 18th generation of the Li family. Li Lichao's great-grandfather and grandfather were both martial arts masters, and he possessed a scroll of written materials that had been passed down to him through many generations. Within this manual there are two volumes of Taiji Martial Arts, a large volume

and a small volume, both entitled with the words: "Martial Arts Manual" written on the upper left corner of the covers. In the middle two lines, there are eight characters of the martial arts code of conduct left by the monk Li Daozi from the Thousand-Year Temple: "Don't Claim to Be a Disciple until You Have Achieved Success (未成功器、勿名师门)". There is no significant difference between the two volumes in terms of contents, both are obviously from the same original manuscript.²⁷

The small booklet of Taiji Martial Arts Manual is 13.5 cm long and 20.5 cm wide. This volume contains 26 pages with 10 sections as follows: (1) Wuji HPMa Treatise: inscribed by Li Yezhen (Li Chunmao) and presented at the Taishi Shrine in Ming Dynasty, Spring of 1590; (2) Song of Practicing Thirteen Momentums: inscribed by Li Chunmao and presented at the Taishi Shrine in Ming Dynasty, Spring of 1590; (3) Thirteen-Momentum Treatise (十三势论): inscribed by Li Chunmao and presented in Ming Dynasty, February 1632; (4) Long Sparring also Known as Thirteen Momentums (长拳者一名十三势), anonymous; (5) Expositions of Insights into the Practice of the Thirteen Momentums (十三势行功心解): inscribed by Li Zhong; (6) Song of Push Hands (打手歌): inscribed by Li Helin (李鹤林) and presented at the Lecture Hall in Tang Village in Qing Dynasty, February 1787; (7) Essentials of Push Hands (打手要言): inscribed by Li Helin; (8) Taijiquan Treatise (太极拳论): inscribed by Li Helin and presented at the Lecture Hall in Tang Village in Qing Dynasty, February 1787; (9) Names of Thirteen Momentums (十三势目); and (10) "The Knack of Spring-Autumn Saber (春秋刀诀): inscribed from the stele of Warship Palace in Thousand-Year Temple.²⁷

Li Helin was from the 12th generation of the Li family. He was born in 1716 during the 55th year of the Kangxi Emperor's reign. When his grandfather Li Yuanshan compiled the Li Family Genealogy, he was a newborn boy.

However, this young boy went on to become the innovator of Li family martial arts and he created many important documents such as

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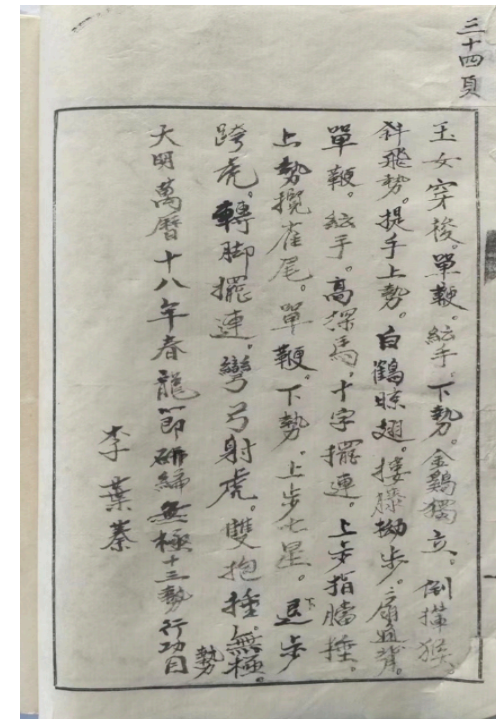


Fig. 17. 58-Posture Routine Created by Li Chunmao in 1590 for Thirteen Momentums of Wuji HPMa (Second Page).



Fig. 18. Action Diagram of 58-Posture Routine for Thirteen Momentums of Wuji HPMa.

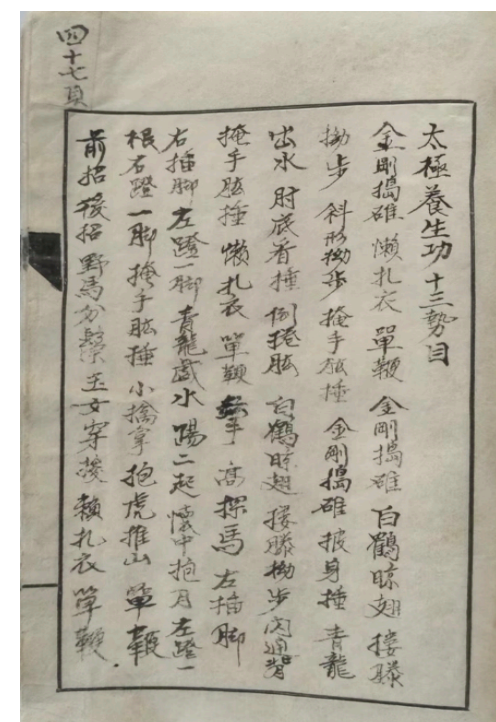


Fig. 19. 58-Posture Routine Created by Li Zhong, Li Xin, and Chen Wangting in 1634, for Thirteen Momentums of Taiji HPMa (First Page).

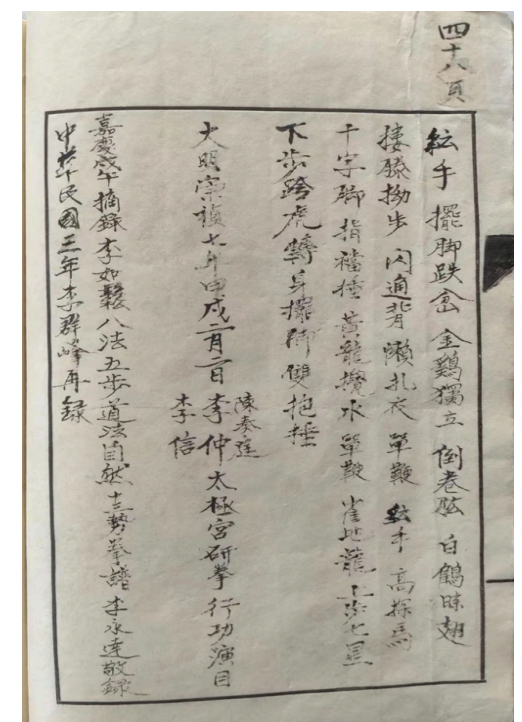


Fig. 20. 58-Posture Routine Created by Li Zhong, Li Xin, and Chen Wangting in 1634, for Thirteen Momentums of Taiji HPMa (Second Page).

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the Taijiquan Treatise, Song of Push Hands, and Essentials of Push Hands. The Taijiquan Treatise was a discourse given by Li Helin to students at the Tang Village's Martial Arts School in the 52nd year of the Qianlong reign (1787). The date was the second day of the second month in the lunar calendar, which coincided with the Spring Dragon Festival and the beginning of the spring season when all things were reborn. This discourse was widely collected and spread by later generations, and was widely regarded as the cornerstone of taijiquan and it facilitated taijiquan becoming a well-recognized name, amongst martial artists.

Li Helin had four important disciples, who were named Wang Anmin, Wang Lincang, Chang Naizhou, and Wang Zongyue. According to "The Origin and Development of Wangbao Spear (王堡枪源流)," which was written by Wang Anmin in 1787: "My elder brother Chang Naizhou and I, together with our juniors Lin Cang and Zhi Chengming, all studied under Li Helin in Tang Village. We were inspired to learn spear, cudgel, and boxing skills from him and worked hard to master them. Through years of dedicated training, we became extremely proficient in these martial arts and gained a reputation as invincible and peerless experts. We were known as the divine spear of Wangbao."

The three disciples all had impressive martial arts skills, and it is recorded that Wang Anmin revitalized the art of Wangbao spear, while Wang Lincang was awarded the sixth-rank feathered plume by the Qing government. Chang Naizhou used taijiquan principles to compile the Chang Family Martial Arts Book (苕氏武技书). The story of the fourth disciple, Wang Zongyue, is described later in this article.²⁸

The relatively large booklet of the Taiji Martial Arts Manual measures 17.5 cm in height and 20 cm in width, and there are 18 pages with 11 articles. The contents and inscriptions are basically the same as those of the prior booklet, except it has one additional article as "The Arts of Body Movement, Saber, Spear, and Discharging in Push Hands".²⁷

4-3. Discovery and Content of the Thirteen-Momentum Martial Arts Manual - Collected by Li Qunfeng in Tang Village

In May 2019, during the renovation of Li Yan's former residence in Tang Village, the Thirteen-Momentum Martial Arts Manual was discovered at the home of Li Qunfeng, the great-grandson of the former owner of the residence, Li Helin. This manual is a thread-bound 80-page Xuan-paper (宣纸) manuscript. It measures 25 cm in height and 16 cm in width, and the cover bears the title "Thirteen-Momentum Martial Arts Manual" in five Chinese characters. The content of the "Thirteen-Momentum Martial Arts Manual" is divided into two parts. The first part is the Taiji HPMa Manual, while the second part contains all the content of Li Lichao's Taiji Martial Arts Manual, with the addition of extremely important historical materials relating to martial arts.

The first page of the manual also features the eight-character martial arts precept: "Don't Claim to Be a Disciple until You Have Achieved Success". The next are five pages of the Taiji HPMa Manual, which is missing from the Li Family Genealogy. The Taiji HPMa Manual, created by Li Zhong, Li Xin, and Chen Wangting in 1634, contains 10 chapters: "Preface, Sacred Origins, Martial Arts Principles, Martial Arts Naming, Martial Arts Execution, Body Positions, Martial Arts Foundation, Internal Cultivation, External Defense, and Martial Arts Treatises", as well as the author's signature at the end. The next page is another preface, consisting of a 32 five-character motto, written by Li Yongda (李永达) in the Wuwu (戊午) Year of the Jiaqing (嘉庆) reign (1798) of the Qing Dynasty.²²

The subsequent 5 pages are the Table of Contents of the second part, which provide a detailed list of 34 sections of the Taiji HPMa Manual as follows: (1) Diagrams of Wuji and Taiji; (2) Book of Luo and Diagram of the Yellow River (洛书·河图); (3) Diagram of Three Powers and the Relationship of Heaven, Earth and Humanity; (4) Pre-Heaven Eight Trigrams and Thirteen-Momentum Routine; (5) Pan Gu Axe Stele

and the Myth of Fuxi and Nüwa (盘古斧碑·伏羲女娲典故); (6) The Classic of the Tao Explained by Master Yin Shou Zi (尹寿子); (7) Han Dynasty Image of Li Ziran and Couplet Crossing the River; (8) Emperor Wu (汉武帝) of Han's Posthumous Decree of Family Name to Master Li Ziran; (9) Memorial Stele for Master Li Ziran by Eastern Han Dynasty Physician Dongfang Shuo (东方朔); (10) Memorial Stele for Master Li Ziran by General Zhang Guofan (张国藩); (11) Taoist Guiding Techniques of Li Ziran; (12) Diagram of Cultivation Routine of Wuji HPMa by Li Chunmao; (13) Diagram of Eight Trigrams of Thirteen-Momentums for Wuji Health Preserving by Li Chunmao; (14) Wuji Health Preserving Boxing Treatise by Li Yezhen; (15) Thirteen-Momentum Treatise by Li Chunmao; (16) Song of Practicing Thirteen Momentums by Li Chunmao; (17) Postures of Wuji Thirteen Momentums by Li Yezhen; (18) Diagram of Wuji Thirteen-Momentum Routine; (19) Illustration of Li Zhong's Martial Arts Practice; (20) Long Boxing Also Known as Thirteen Momentums; (21) Expositions of Insights into the Practice of the Thirteen Momentums by Li Zhong; (22) Postures of Thirteen Momentums of Taiji HPMa by Li Zhong, Li Xin, and Chen Zouting; (23) Illustration of Li Helin's Martial Arts Practice; (24) Taijiquan Treatise by Li Helin; (25) Song of Push Hands by Li Helin; (26) Essentials of Push Hands by Li Helin; (27) Spring and Autumn Knife Secrets Recorded by Li Ruchun; (28) Song of Divine Spear by Li Helin; (29) Song of Practicing Thirteen-Momentum Sword by Li Rusong (李如松); (30) Thirteen-Momentum Pole Techniques by Li Rusong; (31) Thirteen-Momentum Saber Techniques by Li Rusong; (32) Four Spear and Pole Techniques by Li Rusong; (33) Saber Techniques by Li Rusong; and (34) Martial Arts of Tang Village.²²

This Thirteen-Momentum Martial Arts Manual was recorded by Li Yongda, the eldest son of Li Helin, from the "Thirteen-Momentum Martial Arts Manual annotated with the Eight Methods, Five Steps, and the Natural Way of Taoism" written by Li Rusong, who was the 11th generation of the Li family and the abbot of the Longevity Temple. The recording date was February of

the Wuwu year of the Jiaqing reign (1798). Later, Li Qunfeng transcribed it again in February of the third year of the Republic of China (1914).²²

In 1914, although there were many martial artists gathered in Beijing, there were only few practitioners of Yang-style taijiquan. Other styles of taijiquan, such as Chen-style and Wu-Hao style, were still restricted within their original geographical boundaries for dissemination. At that time, all martial arts manuals were kept privately and never made public. Therefore, the 80-page Thirteen-Momentum Martial Arts Manual copied by Li Qunfeng in 1914 could not have come from anyone outside of the Li family in Tang Village.

This newly discovered Thirteen-Momentum Martial Arts Manual has four important highlights: (1) it complements the missing document: Song of Practicing Thirteen Momentums and the lost manual: Taiji HPMa in the Li Family Genealogy; (2) it confirms and verifies the contents and authors of respective taijiquan scriptures, treatises, songs, and skills contained in the Taiji Martial Arts Manual, collected by Li Lichao. Moreover, the time these Taijiquan Classics were authored by the Li family members predates the relevant Taijiquan Classics, which were presumably written by Wang Zongyue or Wu Yuxiang; (3) it lists the contents, comparing between the 58 postures of Wuji HPMa, starting with Wuji Starting Stance (无极起势) and Grasping the Sparrow's Tail (揽雀尾) and the 58 postures of Taiji HPMa beginning with Vajra Pounding the Mortar (金刚捣碓) and Lazily Pulling up the Robe (懒扎衣); (4) it records the existence of martial arts schools such as Xinyi Hall (心意堂), Hengxin Hall (恒心堂), Qunying Hall (群英堂), and Longxing Hall (隆兴堂) in Tang Village.²²

4-4. Techniques of Thirteen Momentums and A Comparison of Two Sets of 58 Postures in Thirteen-Momentum Martial Arts Manual

The Wuji HPMa, Taiji HPMa, and the arts of sword, saber, spear, and staff of Tang Village all share the same Thirteen-

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Momentum techniques. The explanation of the Thirteen-Momentum techniques is recorded in the document: “Long Boxing Also Known as Thirteen Momentums (长拳者一名十三势)” in the Thirteen-Momentum Martial Arts Manual, which is detailed as follows: “Long Boxing is like the mighty Yangtze River and boundless ocean, ceaseless and unyielding. Thirteen Momentums consist of Peng (ward-off), Lu (roll-back), Ji (press), An (push), Cai (pluck), Lie (split), Zhou (elbow-strike), and Kao (shoulder-strike), which represent the Eight Trigrams. Moving forward, moving backward, looking left, looking right, and staying centered represent the Five Elements. In summary, the Thirteen Momentums consist of Peng, Lu, Ji, An, Cai, Lie, Zhou, and Kao, which represent the four cardinal directions of Kan (坎), Li (离), Zhen (震), and Dui (兑). Additionally, Cai, Lie, Zhou, and Kao represent the four diagonal directions of Qian (乾), Kun (坤), Gen (艮), and Xun (巽). Finally, moving forward, moving backward, looking left, looking right, and staying centered represent the five elements of water, fire, wood, metal, and earth.”

From the content of the Thirteen-Momentum Martial Arts Manual, it indicates that the eighth generation Li Chunmao, the ninth generation Li Zhong, and the 11th generation Li Rusong all have publications named after the Thirteen Momentums. Therefore, the inheritance of the Thirteen-Momentum techniques originated from the Wuji HPMA and continued to the Taiji HPMA. The arts of sword, saber, spear, and staff of Tang Village also contain the inherited Thirteen-Momentum techniques.

It should also be mentioned that the essay: “Explanation of Taijiquan (太极拳释名)” by Wang Zongyue, which is well-known among modern practitioners, has the same content as the document “Long Boxing Also Known as Thirteen Momentums” in the Thirteen-Momentum Martial Arts Manual of Tang Village. If one understands that the Thirteen Momentums originate from Wuji HPMA, and not from taijiquan; one would question if the Explanation of Taijiquan was truly written by Wang Zongyue.

Li Rusong explained the Thirteen Momentums of Taiji HPMA using the Eight Methods, Five Steps, and the Natural Way of Taoism. Both Confucianism and Taoism in China follow the theory of Yin and Yang of Taiji to guide their lives, believing in the principles of “Man follows the earth, the earth follows heaven, heaven follows the Tao, and the Tao follows nature”. It is believed that all things in the universe follow the law of the five elements and the rotation of the eight trigrams. The ever-changing taijiquan momentums are refined into eight-hand momentums (ward-off, roll-back, press, push, pull-down, split, elbow strike, shoulder strike) and five-foot momentums (advance, retreat, look left, look right, central equilibrium). The momentums of the upper and lower limbs are coordinated through the body kinetic chain to promote the body's motion in six degrees of freedom in three-dimensional space. This allows the Thirteen Momentums to embody the unity of nature and humanity through the principles of Eight Methods, Five Steps, and the Natural Way of Taoism.²⁹

For clarity, the term “Momentum (势)” in the Thirteen Momentums (十三势) refers to the power of the momentum that are expressed from the inside out; that is the overall energy of the body's momentums. Each momentum has an offensive and defensive power that operates according to the principles of Wuji and Taiji. Through proper practice of the correct postures, the Thirteen Momentums can cultivate coordinated internal momentums or internal strength that uses softness to overcome rigidity.

Regarding the Thirteen Momentums, two routines of 58 postures, with different individual names, are provided for Wuji HPMA and Taiji HPMA, respectively. This reflects the Chinese ancestors' belief in the numerical totems of 5, 8, and 13.

The term “Posture (式)” in the 58 Postures (58式) refers to the form of the movements; that is the special movements and techniques that comprise martial arts routines.

The forms or sequence of movements in a routine can this have many different styles.

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However, if the operation of the forms or sequential movements in the routine does not conform to the principles of Wuji and Taiji, it will be very difficult to cultivate the internal strength of the Thirteen Momentums that uses softness to overcome rigidity. Therefore, the relationship between “momentum” and “posture” can be expressed as: “having posture without momentum is an empty frame, and having momentum without posture is not martial arts (有式无势是空架,有势无式不成拳)”.

Due to individual operating emphases between Wuji HPMA and Taiji HPMA, the techniques and styles of the two sets of individual 58 postures are not entirely consistent with each other.

For example, the opening posture of Wuji Starting Stance in the 58 postures of Wuji HPMA is altered to the posture of Vajra Pounding Mortar in the 58 postures of Taiji HPMA. Similarly, the Grasp the Sparrow's Tail becomes Lazily Pulling up the Robe, and Repulse the Monkey (倒撵猴) becomes Backward Roll of Arms (倒卷肱).

Upon reviewing the content and style of the 58 postures of Wuji HPMA, it was noted that many of the postures were drawn from Li Ziran's Guiding and Pulling Exercises (导引术) in ancient Han Dynasty and from the Wuji HPMA by Monk Shili of Tang Dynasty (唐代十力和尚). Overall, the actions are gentle, smooth, and continuous, like Yang-style taijiquan. The content and style of the 58 postures of Taiji HPMA drew the postures from other techniques, including 32-posture Long Boxing of Qi Jiguang (戚继光), Tongbei boxing, Xinyi Liuhe boxing and spear, with coiling, folding, and varying speeds, clearly resembling Chen-style taijiquan.^{30,31}

In the past, some experts have speculated that Yang-style taijiquan originated from Chen-style taijiquan, with Yang following Chen, and that the names of some of the postures in Yang-style taijiquan, such as Grasp the Sparrow's Tail and Repulse the Monkey were the result of either a misunderstanding, or a miscommunication of the names Lazily Pulling up the Robe and

Backward Roll of Arms. It can now be said that this speculation is now clearly contrary to history. The Thirteen-Momentum Martial Arts Manual of Tang Village corrects these misconceptions, and restores the historical authenticity.

In fact, Li Chunmao's creation of the 58 postures of Wuji HPMA appeared earlier, while the inheritance of the 58 postures of Taiji HPMA came later. The 58 postures of Taiji HPMA were created and practiced by Li Zhong, Li Yan, and Chen Wangting, who referred to the 58-posture structure of Wuji HPMA and adopted additional postures from the 32-posture Long Boxing of Qi Jiguang, Eight-Style martial arts of Thousand-Year Temple, Tongbei boxing, Xinyi Liuhe boxing, and spear.

It is important to note that the two sets of 58 postures have their own characteristics and have been coexisting and developing, and directly influencing the subsequent formation of traditional taijiquan styles.

From the current technical characteristics of the major styles, Yang style and Wu style are light, soft, even, and coherent, inheriting the characteristics of the 58 postures of Wuji HPMA. Chen style is twisted and coiled with alternating speed, inheriting the characteristics of the 58 postures of Taiji HPMA. Zhaobao style, Wu-Hao style, and the Sun style adopt postures from both sets of 58 postures but with different emphasis. They have twisting and coiling postures like Vajra Pounding Mortar and Lazily Pull up the Robe, as well as soft and coherent postures like Wuji Starting Stance and Repulse the Monkey.

In the following is the naming comparison of the 58 postures of Thirteen Momentums between Wuji HPMA and Taiji HPMA.

4-4.1. Names of 58 Postures of Thirteen Momentums from Wuji HPMA

(1) Wuji Starting Stance, (2) Grasp Sparrow's Tail, (3) Single Whip, (4) Lift Hands, (5) White Crane Spreads Wings, (6) Brush Knee and Twist Step, (7) Play the Lute, (8) Brush Knee and Twist Step, (9)

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Play the Lute, (10) Step Forward, Deflect, Parry and Punch, (11) Withdraw and Push, (12) Embrace Tiger and Push Mountain, (13) Single Whip, (14) Punch under Elbow, (15) Repulse the Monkey, (16) White Crane Spreads Wings, (17) Brush Knee and Twist Step, (18) Spreads Arms to Strike, (19) Single Whip, (20) Cloud Hands, (21) High Pat on Horse, (22) Kick with Left and Right Feet, (23) Turn Around and Kick, (24) Step Forward, Punch and Strike, (25) Turn Around and Double Kick, (26) Sweep Kick with a Turn, (27) Turn Around and Kick with Heel, (28) Step Forward, Deflect, Parry and Punch, (29) Withdraw and Push, (30) Embrace Tiger and Push Mountain, (31) Single Whip, (32) Wild Horse Parts Mane, (33) Single Whip, (34) Fair Lady Works at Shuttle, (35) Single Whip, (36) Cloud Hands, (37) Lower Stance, (38) Golden Rooster Stands on One Leg, (39) Repulse the Monkey, (40) Diagonal Flying, (41) Lift Hands, (42) White Crane Spreads Wings, (43) Brush Knee and Twist Step, (44) Fan Through the Back, (45) Single Whip, (46) Cloud Hands, (47) High Pat on Horse, (48) Cross Hands and Lotus Kick, (49) Step Forward and Strike to Groin with Fist, (50) Step Forward and Grasp Sparrow's Tail, (51) Single Whip, (52) Lower Stance, (53) Step Forward to Seven Stars, (54) Step Back and Ride Tiger, (55) Turn Around and Sweep the Lotus, (56) Bend Bow and Shoot Tiger, (57) Double Embrace Punch, and (58) Wuji Stance.

4-4.2. Names of 58 Postures of Thirteen Momentums from Taiji HPMA

(1) Vajra Pounds Mortar, (2) Lazily Pull up the Robe, (3) Single Whip, (4) Vajra Pounds Mortar, (5) White Crane Spreads Wings, (6) Brush Knee and Twist Step, (7) Diagonal Form Twist Step, (8) Hidden Hand Elbow Strike, (9) Vajra Pounds Mortar, (10) Over the Shoulder Punch, (11) Blue Dragon Emerges from Water, (12) Punch under Elbow, (13) Backward Roll of Arms, (14) White Crane Spreads Wings, (15) Brush Knee and Twist Step, (16) Spreads Arms to Strike, (17) Hidden Hand with Elbow Strike, (18) Lazily Pull up the Robe, (19) Single Whip, (20) Cloud Hands, (21) High Pat on

Horse, (22) Left Foot Oblique Insert, (23) Right Foot Oblique Insert, (24) Left Heel Kick, (25) Blue Dragon Plays in Water, (26) Two Kicks in Succession, (27) Embrace the Moon, (28) Left Heel Kick, (29) Right Heel Kick, (30) Hidden Hand Elbow Strike, (31) Small joint lock, (32) Embrace Tiger and Push Mountain, (33) Single Whip, (34) Forward and Backward Pushing, (35) Wild Horse Parts Its Mane, (36) Fair Lady Works at Shuttles, (37) Lazily Pull up the Robe, (38) Single Whip, (39) Cloud Hands, (40) Swing Leg and Twist Step, (41) Golden Rooster Stands on One Leg, (42) Backward Roll of Arms, (43) White Crane Spreads Wings, (44) Brush Knee and Twist Step, (45) Spreads Arms to Strike, (46) Lazily Pull up the Robe, (47) Single Whip, (48) Cloud Hands, (49) High Pat on Horse, (50) Crossed Feet, (51) Strike to Groin with Fist, (52) Yellow Dragon Stirs Water, (53) Single Whip, (54) Sparrow on the Ground Turning into a Dragon, (55) Step Forward to Seven Stars, (56) Step Back and Ride Tiger, (57) Turn Around and Kick with Heel, and (58) Double Embrace Punch.

4-5 A Comparison of Martial Arts Manuals of Tang Village with Those of Wu Yuxiang and Wang Zongyue

It is widely known amongst Taijiquan enthusiasts that many taijiquan treatises, songs, and literatures, contained in Tang Village's Taiji Martial Arts Manual, which were collected by Li Lichao and the Thirteen-Momentum Martial Arts Manual collected by Li Qunfeng, were also collected by families that practiced traditional taijiquan styles, except for the Wuji Health Preserving Boxing Treatise and Taiji HPMA Manual. However, the authors of those Taijiquan Classics are considered as Wang Zongyue, Wu Yuxiang, or even Zhang Sanfeng. For example, the Taijiquan Treatise beginning with the sentence of "Taiji comes from Wuji and is the mother of Yin and Yang" has always been regarded as a theoretical classic of taijiquan and it is considered by the academic society to be an exemplary article of Wang Zongyue's explanation of taijiquan based on the principles of the Book of Changes (易经). Nevertheless, according to the two martial

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arts manuals of Tang Village, the Taijiquan Treatise was authored by Li Helin with an inscription as presented at the Lecture Hall in Tang Village on February 2, in the 52nd year of the Qianlong Emperor (1787) in the Qing Dynasty.^{32,33,34}

The important fact is that the original documents of Li Chunmao, Li Zhong, and Li Helin were all created earlier than those of Wang Zongyue and Wu Yuxiang. Wu Yuxiang lived from 1812 to 1880, and the life of Wang Zongyue has yet to be confirmed. The elders of Tang Village claim that Wang Zongyue was a disciple of Li Helin and came to Tang Village to teach in the 52nd year of Qianlong's reign (1787). On Li Helin's 78th birthday in the 58th year of Qianlong's reign (1793), Wang Zongyue personally wrote the plaque "House of Distinguished Martial Arts Leader (武元杰第)" to celebrate his teacher's birthday and hung it on the door of Li Helin's residence. This plaque was burned during the Cultural Revolution in 1966, and the elders of Tang Village still remember it vividly. Many people (including the person who burned the plaque) testified to this. According to Tang Hao's research over a hundred years ago, Wang Zongyue was the author of the Yin Fu Spear Manual (阴符枪谱) and taught in Kaifeng, Henan Province in the 59th year of Qianlong's reign (1794).^{32,33,34}

4-6 Verification of the Martial Arts Manuals of Tang Village and Those of Wu Yuxiang and Wang Zongyue

It is well known that the existing versions of Wang Zongyue's Taijiquan Manual came from a manual copied by Wu Yuxiang from his brother Wu Chengqing (武澄清), who was serving as the magistrate of Wuyang County in Henan Province. Wu Chengqing obtained the manual from the Li family's salt shop in Beiwudu Town (北舞渡镇), Wuyang County (舞阳县). Wu Yuxiang, who was visiting his elder brother in Wuyang at the behest of his mother, copied the manual and took it back to his hometown. Wu Yuxiang and his nephew Li Yiyu (李亦畬) then revised it, eventually turning it into a Wu family manual. Li Yiyu copied three versions, keeping one for himself, giving one

to his younger brother, and giving another to his friend Hao He (郝和). These three versions, collectively known as the Three Old Manuals (老三本), which is Wang Zongyue's Taijiquan Manual. There are many well-known reports of this, by later generations.³⁵

What is less known is that, through joint investigations by coauthor Li Libing, the Beiwudu Town Salt Shop was owned by Li Helin and his son Li Yongda (alias Li Zhende 李振德) from Tang Village. The original location still has a plaque of Zhende Salt Field. When Li Helin's grandson continued to operate the salt shop and salt field in Wuyang, Wu Chengqing often consulted with the Li brothers on the Thirteen Momentums of Taijiquan. From this, it can reasonably be inferred that someone (perhaps Wang Zongyue) copied the Martial Manual of Tang Village and transmitted it to Wuyang, where it was copied by Wu Chengqing and later by Wu Yuxiang.³⁶

People may still ask: since the Taiji Martial Arts Manual and the Thirteen-Momentum Martial Arts Manual from Tang Village have authors' signatures at the end of each document, why did it become Wang Zongyue's Taijiquan Manual under Wu Yuxiang's hands? We may find the answer in Li Yiyu's write-up. In Li Yiyu's writing on the Yin Fu Spear Manual, he indicated that "My maternal uncle Wu Yuxiang shared two documents of Wang Zongyue's Taijiquan Manual and the Yin Fu Spear Manual, which are rare treasures. The ancient manuals should not be shown to others, handling them with caution and care, and keeping in mind".

On the cover of Yin Fu Spear Manual, there is a seal of the author Wang Zongyue. However, the other document of Taijiquan Manual does not have the author's signature. From the postscript written by Wu Chengqing for the Taijiquan Manual, it says, "The author of this manual is unknown, but it is written in a very sophisticated way. Those who are not proficient in martial arts cannot write such a treatise". This proves that there is no author's signature on Wu Chengqing's copy of the Taijiquan Manual. In fact, all the documents in this copied

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manual have no author's signature. As a result, this led to the confusion by Wu Yuxiang.

Given the seal of Wang Zongyue found in the Yin Fu Spear Manual, it was mistakenly believed that the copied Taijiquan Manual was also written by Wang Zongyue. At this point, the truth can be made clear that the Taijiquan Manual copied by Wu Yuxiang was an unsigned version from Tang Village, which was obtained from a Li family member who ran a salt shop.³⁷

5. Authenticity of Tang Village's Historical Materials

5-1 Historical Materials of Tang Village Has Attracted Substantial Attention from Historians and Martial Arts Communities

In April 2004, the Li family members of the Tang Village went to Hongdong County, Shanxi Province to investigate their roots and coincidentally attended the National Hongdong Immigration Culture Symposium and were invited to speak. Li Libing presented photos of the Li Family Genealogy, the Hongdong Immigration Stele of Thousand-Year Temple, and other materials that aroused great interest among the attending delegates. Professor Wang Xingya (王兴亚), a Ming Dynasty specialist from the Department of History and Archaeology at Zhengzhou University, said: "If the genealogy and supporting materials are true, they can solve three historical mysteries: Li Yan's background, the origins of taijiquan, and the route of the Central Plains migration". After the meeting, Wang Xingya visited Tang Village many times and published several papers such as "Research on Li Yan's Hometown and Family Background". In 2005, Yuan Fuquan (原福全), director of the Wen County Sports Bureau, and Zhang Weizhen (张慰珍), village chief of Chen Village, visited Tang Village and the Thousand-Year Temple and published papers such as "The Century-Long Debate over the Origin of Taijiquan Is Settled" and "Who Is the Author of the Taijiquan Treatise?" The Guangming Daily published an article entitled: "A Genealogy Reveals a Three-Hundred-Year Historical

Mystery". Wang Guangxi (王广西), a research fellow at the Henan Academy of Social Sciences, and an expert in literary history and folklore, visited Tang Village and concluded that the Thousand-Year Temple and Shaolin Temple, one in the north and one in the south, have become the source of China's two major martial arts systems. Rather than being a historical coincidence, it is more appropriate to consider it as an inevitable result of the nurturing and cultivation of Central Plains culture.

5-2. Verification of the Authenticity of Li Family Genealogy

In Chinese culture and customs, it has long been said that compiling genealogy is the record of the life, merits, and blood lineage of ancestors by descendants. It is considered to be a sacred activity for later generations to worship and inherit, and it cannot tolerate any falsehood or impurity. However, that said, multiple approaches were adopted in the research of the Li Family Genealogy, including interviews with family members and villagers, evidence was also taken from graves, tombstones, genealogical records, and contracts were reviewed, and multiple verification were made through local and county gazetteers, then comparison were made of genealogies with martial arts manuals, which were cross-referenced with historical records from the Ming and Qing dynasties, finally there was on-site investigations of descendants of immigrants to Hongdong, and confirmations by residents of Chen Village and the Chen Family Genealogy and Family Rituals.

In the investigation of the authenticity of the Li Family Genealogy, relevant personnel particularly highlighted the following background information. Li Yuanshan, who compiled the genealogy at the age of 73, recorded his father Li Zhong, uncle Li Xin, and grandfather Li Chunshao, all of whom were close relatives of his generation. Thus, he was able to describe in detail the processes of his ancestors' learning and creation of martial arts, encountering troubles, avoiding danger, enlisting, being killed, and fleeing. His authenticity is reliable. Even for historians and martial

artists, it would be difficult to fabricate such detailed and credible information.

Li Yuanshan recorded the deeds of his relatives who joined the bandit group of Li Zicheng as generals. As a tribute student, he would never take the risk of being executed and fabricate a bandit father or bandit uncle in the genealogy. He could not conceal the truth from his descendants, so he had to warn them to "know the current situation and follow the right path" and "do not mention the genealogy when worshiping ancestors". It can be confirmed that Li Yuanshan had no motive to fabricate falsehoods.

The person who owned and kept the Li Family Genealogy, an old woman named Wang Guiying, was an illiterate rural woman who was reluctant to show the genealogy. She had neither the ability to fabricate nor the motive to forge it.

It is thus argued that the historical materials discovered in Tang Village have undergone the relevant verification and examination.

5-3. Historical Materials from Tang Village Included in Authoritative National Historical Records.

Through the examination of these various sources by national and Henan provincial historical experts and scholars, these relevant historical materials (such as the Li Family Genealogy and two martial arts manuals of Tang Village) have recently been included in authoritative publications such as China Regional Culture Overview (中国地域文化通览), Chronicles of Chinese History (中华通鉴), and Encyclopedia of Central Plains Culture (中原文化大典). Among them, the Encyclopedia of Central Plains Culture: Folk Customs and Martial Arts Volume (中原文化大典·民俗·武术卷) is one of the 55 volumes of the Encyclopedia of Central Plains Culture. In this volume, the martial arts system of the Thousand-Year Temple in Henan Province is listed as one of the three major martial arts systems in Central Plains, alongside the Shaolin Temple system on Mount Song and the Hui ethnic system. The Thousand-Year Temple system includes taijiquan, Changjia boxing (苌家拳), Xinyi

boxing, Wangbao spear technique, and some other small boxing styles scattered in northern Henan.^{38,39,40}

Of the same encyclopedia, in the section of "The Origin of Taijiquan", it is certified that Li Zhong and Li Xin, along with Chen Wangting created Taiji HPMA and Thirteen-Momentum Martial Arts at the Taiji Palace in the Thousand-Year Temple. This is the first time in the history of Chinese martial arts that the name of Taiji has been combined with boxing techniques and named as a skillful martial art, called Taiji Martial Arts.

Another authoritative publication: "Chronicles of Chinese History: Henan Volume (中华通鉴·河南卷)" was written following the same format of Sima Guang's (司马光) "Zizhi Tongjian or Comprehensive Chronicle of History (资治通鉴)". Page 222 of this large publication records that in the 18th year of the Wanli period (1590), Li Chunmao created the Wuji Martial Arts and authored Wuji Health Preserving Boxing Treatise and Song of Practicing Thirteen Momentums. Page 225 records that in the seventh year of the Chongzhen period (1634), Li Zhong and Li Yan, two tribute students from Tang Village in Henan (Boai County), and their cousin Chen Wangting from Chen Village in Wen County, learned martial arts at Thousand-Year Temple, where they created taijiquan and authored the Taiji HPMA Manual. This marks the beginning of Chen-style taijiquan.^{39,40}

6. Conclusion and Perspectives

The historical materials discovered in Tang Village have convincingly clarified the scientific and thorough study of the origin of taijiquan, which was previously unclear and often misunderstood.

The authenticity of the Li Family Genealogy, compiled in the 55th year of the Kangxi reign (1716) of the Qing Dynasty, has been confirmed by experts and by scholars. The genealogy records the history of a family in Boai County, Henan Province, which was known for both its cultivation of literature and their understanding of martial arts. It documented the experiences of Li Zhong, Li

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Yan, and Chen Wangting, three young men who created taijiquan. It also records the Thousand-Year Temple, a martial arts holy land that gave birth to taijiquan. The genealogy further describes three classic martial arts documents related to taijiquan, namely Wuji Health Preserving Boxing Treatise, Song of Practicing Thirteen Momentums, and Taiji HPMA Manual.

The two martial arts manuals of Tang Village prove that the Thirteen Momentums originated from the Wuji HPMA of Tang Village and were later transmitted to taijiquan. The Thirteen Momentums were the initial source, and taijiquan was the subsequent flow.

Additionally, the two manuals provide the world with the real authors of the famous Taijiquan Classics in terms of scriptures, treatises, songs, and knacks. It is particularly credible to confirm the time and place when Li Chunmao, Li Zhong, and Li Helin created these classic martial arts documents. The above-mentioned historical materials on the origin of taijiquan in Tang Village have been incorporated into academic and authoritative publications locally and nationally.

The excavation and discovery of historical martial arts materials of Tang Village were both a coincidence and a necessity. These precious historical materials have helped us unravel the historical mysteries, which have long surrounded the origins of taijiquan, and they now guide us to explore new paths for taijiquan. The excavation and inheritance of traditional martial arts are systematic projects. The purpose of excavation is inheritance, and the purpose of inheritance is development, and the driving force of development is innovation.

We need to seek development through innovation. Open academic discussions and diverse opinions are essential for the development of martial arts and are a powerful driving force for the development and innovation of taijiquan.

Currently, there are still some doubts and some resistance within the martial arts community towards the historical materials

of Tang Village. The main manifestation is the suspicion that the new historical materials of Tang Village are forgeries of modern times. For example, it has been suggested that Li Chunmao's Wuji Health Preserving Boxing Treatise plagiarizes Sun Lutang's book: "A Study of Xingyi Boxing" published in 1925. The criticism is regarding the language and grammar used in the Li Family Genealogy, which may not conform to the norms of the Ming and Qing dynasties. Another concern is the conservatism of certain sects and local protectionism, which has resulted in blocking news and setting up obstacles. The appearance of these phenomena is not unexpected. It is therefore hoped that further academic research will distinguish between truth and falsehood, correct any deviations, unify our understanding, and help us embark on a new journey for taijiquan.

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Traditional Taijiquan's Three Evolutionary Forms and Characteristics in Their Development

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Abstract—Chinese martial arts both reflect the lifestyle of the Chinese people and serves as an important link in understanding local cultural life in China. With Taijiquan's recent recognition as an intangible cultural heritage by the UNESCO, the guardians of traditional Taijiquan now face the question of what to protect, how to protect, and how to develop and preserve its history. This paper uses literature reviews and logical analysis to resolve the development of Chen-style Taijiquan and explains how traditional Taijiquan has evolved into three different forms; traditional, competitive, and health-oriented. It analyzes the characteristics of the three evolutionary forms and proposes that in this era, the protection and inheritance of traditional Taijiquan as an intangible cultural heritage should highlight the cultural core elements within the Taiji record, and it is necessary to study the effect, and the crucial link between martial arts and health, in order to continue to preserve its legacy, and permit its future developments to all future generations, worldwide.

Introduction

Taijiquan is an important part of Chinese traditional culture, it embodies traditional culture and it sits at the core of many current martial arts, in many different schools. It is loved by the masses for its ability to improve fighting skills, its ability to improve one's health (in some cases it has helped people recover from diseases and injuries), it cultivates temperament, and it can also help

prolong life. Today, it is estimated that more than 300 million people practice Taijiquan worldwide, and it was included in the UNESCO list of intangible cultural heritage in the year 2020; and the mystique of Taijiquan has attracted scholars, both in China and abroad, who not only practice it for fitness, but to also explore the essence of Chinese traditional culture.

Traditional Taijiquan has a long cultural history that goes back at least 400 years. From the surviving literature¹, it originates from a complex overlap between the basic theories of ancient Chinese philosophy, traditional Chinese health preservation, and Chinese medicine. It reflects the flow of traditional cultural ideas and interprets the cultural connotations of form and spirit, self-cultivation and health preservation. In some ways, it is a microcosm of China's 5,000-year culture.

Perhaps because of a response to the continuing progress of society and the development of new technologies, and the sometimes harsh collisions and exchanges between world cultures, many newcomers have become interested in practicing traditional Taijiquan routines to help relieve their stress, while others simply wish to study the martial arts techniques, and to discuss the many ideological theories contained in Taiji culture. As a result, with its gradual globalization, both its legacy (which can be described as its impact on the world) and the methods employed in the transfer of traditional Taijiquan ideas are slowly changing.

The Origin of Traditional Taijiquan

According to the research of Tang Hao, a prominent Chinese martial arts historian, the earliest person to teach Taijiquan was Chen Wangting from Chenjiagou (Chen Village) in Wen County, Henan Province, during the late Ming and early Qing Dynasties, which was between 1618 to 1683. He absorbed the 32 movements of the Long Fist of Qi Jiguang and many other famous boxing techniques which were in use at that time, and combined them with ancient Chinese health preservation techniques to aid guiding and regulating the meridians. In doing so, he created the Chen Style Taijiquan which is famous for emphasizing the use of softness to overcome hardness^{2,3}.

This new martial art was kept a closely guarded secret in Chen Village, and it was not until the 6th generation that descendant of Chen Wangting, a person named Chen Changxing, that the art of Taijiquan was passed outside of the family to Yang Luchan, a non-relative from Yongnian, Hebei. With new input from other martial art experts the form then gradually evolved, to create the Yang Style, Wu Style, and Sun Style and it began to spread throughout the China⁴.

In the autumn of the 17th year of the Republic of China, Chen Fake, the 17th generation descendant of the Chen family, and his nephew Chen Zhaopi brought the Chen Style Taijiquan out from its birthplace, in Chen Village, to Beijing, Nanjing and to many other cities. After Chen Fake passed away in 1957, his son Chen Zhaokui then popularized Chen Style Taijiquan in Shanghai, Nanjing, Zhengzhou, Shijiazhuang, and Jiaozuo⁵. This was then followed by Chen Fake's students Gu Liuxin and Shen Jiazhen, who compiled the book "Chen Style Taijiquan" which was based on the postures and photographs of Chen Fake and Chen Zhaokui.

As a result of the production of this first pictorial book, the Chen Style Taijiquan became more wide-spread both in China and then ultimately all around the world, and with the various pressures of many different needs, traditional Taijiquan has undergone further changes, some being subtle and some

perhaps not so subtle, in its evolution and development.

2. The Characteristics of Traditional Taijiquan

2.1. Technical Characteristics of Traditional Taijiquan

Today traditional Taijiquan can be roughly divided into two primary forms; Traditional Taijiquan, and Competitive Taijiquan. Traditional Taijiquan is based on combat, and although it has diversified over time, as long as it is labeled "traditional," it cannot ignore the pursuit of combat attack and defense. Because of this, traditional Taijiquan can be defined as a combat skill that is characterized by "using softness to overcome hardness; which can be described in more esoteric terms as to wait for movement in stillness, turning circles to neutralize straight lines, using small movements to overcome large movements, and using weakness to overcome strength." The physics behind these Taijiquan techniques has been discussed in some detail in Volume 1 of Journal of Taiji Science⁶ and they emphasize the unity between martial arts attack and defense techniques. This is also the core content of Taijiquan.

Traditional Chen Style Taijiquan maintains the inherent combat characteristics of Taijiquan, such as lightness and heaviness, the combination of softness and hardness, fast and slow movements, and the use of spiral movements, but very few practitioners can actually master the real combat skills.

2.2 The Training Characteristics of Traditional Taiji's Waist Techniques

Traditional Taiji emphasizes using stillness to control movement, using softness to overcome hardness, avoiding the strong and attacking the weak, borrowing and generating force, and advocates starting from objectivity, being responsive to the opponent's movements, and being flexible in oneself.

To achieve this, traditional Taiji places great emphasis on "listening to the opponent's

energy," which at the simplest level means accurately judging the opponent's movements and responding accordingly.

Before the opponent launches an attack, one should not act recklessly, but rather, use various techniques to provoke the opponent, to test their strengths, and find their weak points.

Then, once the opponent attacks, one must quickly take the initiative, "following their slightest move while leading them with one's own," and "striking first after waiting for the opponent to strike."

By doing this skillfully, one can lead the opponent off balance, or disperse their strength, taking advantage of their weakness and striking back with full force.

This advanced technique focuses on the core parts of the body, aiming to maintain stability of the body's center of gravity and to achieve the best functional benefits during movement. When encountering various unexpected environmental and unfavorable conditions during movement, one can effectively control the stable posture of the pelvis and trunk muscles, to create a fulcrum for the movement of the upper and lower limbs, which provides a source of force, and achieves the best functional state for force generation, transmission, and control⁷. Therefore, traditional Taiji places special emphasis on training the waist.

In boxing theory, there are many common sayings such as, "without training the waist, it is difficult to achieve high proficiency in martial arts," "the source of fate is at the waist," "the waist is the ruler," "the waist is the driving force," "the source of movement is from the waist, turning into the thighs and arms," "paying attention to the waist's every moment," "starting from the legs, passing through the waist, and manifesting at the hands," "driving with the waist, no movement is without movement." These all show that Taiji places great emphasis on waist (trunk) training⁸. In fact, the traditional Taiji's training skills for the waist are distinctive and highly relevant to core stability and strength training.

2.3 The Training Characteristics of the Traditional Taijiquan's Entwining and Coordinated Techniques

Traditional Taijiquan emphasizes the martial art's technique of attack and defense, and it stresses the organic unity of force and technique.

It also places substantial emphasis on the stability of the body's center of gravity, the coordinated use of the muscles throughout the body, and on the difficult principle of using just the right amount of force, without the use of over-rigid or unnecessary force.

This complex balance is achieved by the active muscles exerting just the required force, passive muscles should exert no force, and the coordinated muscles maintaining exertion.

The traditional Taijiquan frame exerts the core stable power transmission function from the pelvic and trunk muscles⁹.

The Taijiquan's boxing technique is reflected in the entwining of the limbs, the circular route of the movements, the constant changes between "empty and full", and the smooth and continuous flow in the practitioner's movements.

This multidimensional entwining technique can exercise each core muscle group and maintain balance between the muscle's tensions, which allows the trunk to generate bending, lateral bending and twisting movements, and also produce explosive integrated force. It is especially useful for the training of deep small muscle groups in the pelvis and the trunk to overcome the centripetal contraction of self weight and static contraction of head fixation, and it improves core strength and helps maintain a stable posture¹⁰.

The principles and techniques of Taijiquan's martial arts are thus reflected in the essentials of push-hand training and routine movements, which can not only train people's reaction speed, ability, strength, but it also can have great significance in both attack and defense-based combat training.

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3. The Characteristics of Competitive Taijiquan

3.1 Technical Features of Competitive Taijiquan

After the establishment of New China, Taijiquan saw several new developments, including the emergence of Competitive Taijiquan to meet the needs of martial arts competitions. This form of Taijiquan was developed from traditional Taijiquan to create a new form of routine that is in line with modern, open, and free thinking.

In general, competitive Taijiquan is deeply influenced by the Western philosophy of movements that are "faster, higher, stronger" and as a result it advocates for movements that are "higher, more difficult, more beautiful, and new, with a very high demand for physical fitness. Under the restrictions of these new competition rules, many moves are now standardized, more difficult, performative, and they contain artistic features that are not essential, or required in combative martial arts.

In essence, competitive Taijiquan is a modern product that combines a historic martial art with the modern, competitive sports culture, and it can only exist in the form of routines, which are mainly used for competitions, and for performances.

Although the form has the external appearance of traditional martial arts, and it is true that the hand, eye, body, method, and step are largely the same, underneath it has rapidly evolved into a formalized and artistic movement, to meet the needs of judges, who need and are required to identify very clear, understandable movements, that can be used to reliably score a performance, or a competitor at a competition¹¹.

To adapt to the needs of martial arts competitions, performances, and also the promotion of the sport, the National Sports Commission asked various experts to compile the "Simplified Taijiquan," "42-Moments Taijiquan and Sword," "4 Movements Taijiquan," "28-Moments

Comprehensive Taijiquan and Sword," and today's highly appreciated self-designed and selected competition routines¹²⁻¹⁴.

3.2 The Development and Direction of Competitive Taijiquan Boxing

Competitive Taijiquan now has a scientific training system, and there are rigorous evaluation standards, as well as competition rules; and it now firmly belongs to the category of competitive sports. In 2003, after revision of the competition rules of Taijiquan¹⁵, competitive Taijiquan integrated various schools of Taijiquan movements; added various elements of Long Boxing; and established difficulty-movements and connecting-difficulty levels.

The classification and score of difficulty-movements were also determined, which led to the development of Taijiquan towards higher intensity and a general increase in difficulty. Self-selected Taijiquan routines quickly became the mainstream of the competition¹⁶.

As a result, competitive Taijiquan has now become separate from offensive and defensive combat martial arts, and is more similar to Chinese style martial arts gymnastics and figure skating, and there has formed a complete training system for competitive sports. After this reform, contemporary competitive Taijiquan now differs greatly from traditional Taijiquan in terms of movement, content and also artistic appreciation¹⁷. Competitive Taijiquan is currently the only Taijiquan event in the national and international Taijiquan championships with designated difficulty levels.

3.3 The Differences between Competitive Taijiquan and Traditional Taijiquan

Due to the very different goals being pursued, Competitive Taijiquan largely directs Taijiquan towards performance and art, and has gradually shifted Taijiquan towards its "appreciation" value. From the sociological perspective of Taijiquan

development, the learning and practice of traditional Taijiquan embodies the Chinese way of life. Traditional Taijiquan is both a sport and a culture, in which great emphasis is placed on its cultural identity. Its technical system includes boxing, weapon, techniques, and principles, making it a more complete system. In contrast, Competitive Taijiquan only has one form and it lacks the characteristics of "combining physical training with martial arts." The result is its emphasis on "formalization" weakens or drops the core values and content of Taijiquan, which results in a disconnect in the three aspects of boxing principles, techniques, and pushing hands, in the development of Taijiquan¹⁸. Although Competitive Taijiquan and traditional Taijiquan are not two opposing aspects, they are now two different systems, with significant differences in practice process and technical details.

4. The Characteristics of Health Preserving Taijiquan

Taijiquan not only express the body, it is also a form of expression of Chinese philosophy and traditional culture, in which there is the Daoist techniques that guide the techniques of breathing. Buddhist Yi Jin Jing (The Buddhist Book of Changes), and other physical fitness methods have had many important influences on the health-preserving foundation of Taijiquan. In the modern development of Taijiquan, to better adapt to the fitness needs and also the abilities of many different groups and to highlight the health preserving value of Taijiquan, a third form of Taijiquan, called health-preserving Taijiquan, has emerged.

The number that has chosen to learn and practices this form of Taijiquan is by far the largest, with currently more than 300 million practitioners worldwide. They learn and practice traditional Taijiquan and various competition routines, but for this group the purpose of practicing Taijiquan is different from the first two types of Taijiquan. In this case, the techniques do not require offensive and defensive skills, but rather the focus is on the internal breath and the health preservation effect of strengthening the

internal organs. They practice to improve sub-healthy physical signs, and practice is accompanied by slow music during the exercise. Over time, it has become a health-preserving Taijiquan that is used by ordinary people, for daily fitness. The aim of the vast majority of practice groups is to achieve the fitness and health benefits of eliminating diseases and to nourishing the body and mind through both learning and practicing health preserving Taijiquan. In this case. the primary characteristic of the technique of health preserving Taijiquan is it has "Taijiquan", but the concept of "Quan" has basically disappeared.

5. Analysis of the Core Elements of Inheritance and Development of Taijiquan

With the development of different needs within the martial arts community, the author believes that Taijiquan should revolve around two core elements of inheritance and development, in order to not depart from the precious cultural wisdom left by the predecessors of martial arts; and to allow this knowledge to be retained for use by future generations. The first is Taiji, and the second is Quan.

5.1 Emphasizing the Cultural Core Element of "Taiji"

Taijiquan is important, it has rich connotations and profound knowledge, that is deeply rooted in the vast and profound fields of traditional Chinese philosophy, traditional health-preservation, traditional medicine, traditional military science, traditional psychology, and traditional aesthetics. "Taiji" is one of the core elements of traditional Chinese culture, a philosophical concept, a guiding ideology, and even a way of thinking, which is used to guide people's practice of martial arts.

The author believes Taiji is a philosophical concept and a way of thinking, and that Taiji culture is the theoretical foundation for the emergence and development of Taijiquan. The Taijiquan theory also elaborates the offensive and defensive methods of Taijiquan, and practicing Taijiquan can deepen one's understanding and cognition of

traditional culture. In fact, it is recognized that some scholars at home and many scholars abroad first begin to experience and understand the essence of Chinese traditional culture through their practice of Taijiquan.

They experience the Taijiquan theory of being upright, light and flexible, soft and slow, open and close in order, and the harmony of softness and hardness in the natural and elegant movements of "flowing clouds and flowing water", accompanied by music rhythms. They also understand the philosophical connotation, the artistic style of the Quan Jia, and the poetic imagery of Taiji culture, reaching the highest level of spiritual comprehension.

5.2 Emphasizing the Offensive and Defensive Essence of the Combination of Understanding and Application of "Quan"

"Quan" is both an offensive and defensive technique, consisting of Understanding and Application, which are closely interrelated.

When practicing Taijiquan, one must grasp the unique offensive and defensive combat techniques of Taijiquan. Practicing the Taijiquan routine is the "Understanding" part, which can master the techniques of offensive and defensive combat.

It improves the body's fitness and flexibility, and helps people achieve relaxation, softness, roundness, and agility. This is the foundation of practicing martial arts and is the foundation of knowing oneself.

The Taijiquan pushing hands mainly focuses on "Application", seeking ways to achieve practical applications. The techniques include Peng, Lu, Ji, An, Cai, Lie, Zhou, and Kao. Through long-term practice of the techniques of pushing hands, which require relaxation, softness, roundness, and agility, one can become proficient in the application of the eight types of energy of Taijiquan found in all Taijiquan styles: Peng, Lu, Ji, An, Cai, Lie, Zhou, and Kao. First, one must stick, connect, adhere, and follow, without losing or resisting, accurately judging the direction and size of the opponent's energy,

and achieving the effect of "drawing in and letting go" with the strength of "four ounces can deflect a thousand pounds." Secondly, the eight types of energy can achieve lightness and flexibility, follow the opponent's momentum, borrow their strength, sacrifice oneself to serve others, draw in and let go, without resistance or forceful clumsiness, and understand the energy. Finally, through the techniques of dissolve, draw, take, and release, one can achieve the level of "the opponent does not know me, but I know the opponent." The exquisite techniques and magical effects of Taijiquan can then be experienced.

Conclusions

In the author's opinion, the true direction for the development of Taiji is to promote the artistic quality of traditional Taiji routines based on its martial art essence, so that its martial, fitness, and artistic aspects can all be fully developed.

Practicing Taiji is not only for physical fitness. It should also be for cultivating ideal personalities and higher spiritual realms.

Because of this, the charm of Taiji continues to attract more scholars and practitioners around the world, and its great vitality will become increasingly clear to humankind.

Some even predict, with good reasons, that starting from the 21st century, Taiji will become the most popular and most widely practiced sport in the world. Taiji contains the cultural essence of the fusion of "Taiji" and "quan" (fist), embodies the attack and defense essence of combining "body" and "application," and is the crystallization of unique training methods and health effects from the wisdom of the Chinese people.

Practice has proven that sticking to Taiji training has an irreplaceable role in improving human health and enhancing quality of life. It is imperative to fully utilize the many functions of traditional Taiji in the world's fitness campaign, making it a significant contribution to humankind.

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A Human Body Model for Calculating Taiji

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Abstract—Handan Taiji Collage has researched the science of Taiji for many years. In the following is a review of this work. Taiji is now recognized to be a treasure of Chinese martial arts and Chinese culture, but it is important to integrate the ancient poetic descriptions of Taiji with modern science. The classic theory of Taiji is famous for giving a perfect explanation from the qualitative aspect, while leaving very large gaps in the quantitative aspects. This article uses mechanics to describe the defense-offense mechanism of Taiji and applies a scoring-criteria to Taiji for martial arts application. A human body-based math model is established to simulate the defense-offense moves, and dynamic and static formulas for releasing force are derived. To aid these calculations, which can be quite complex, we developed a software program with VBA (Excel visual basic for application), which can be used to calculate the defense and offense capabilities of Taiji and other martial arts.

Introduction

A force in Taiji has the same definition as a force in physics. That is, force is the interaction between objects, where Newton's second law gives a quantitative relationship between force, mass, and acceleration, with the well-known equation $\text{force} = \text{mass} \times \text{acceleration}$.

However, at this moment, the concept of “strength” is not well defined in the martial

arts world, and various authors have used the word, strength, in different ways. Strength is often used in reference to internal aspects. In other words, the quality or state of being strong in body, or in muscular power and vigor¹. In contrast, Jie Gu¹ chose to employ a mechanical definition for strength: where strength is related to momentum. Linear momentum in mechanics is the product of mass and velocity, and angular momentum is the product of rotational inertia and angular velocity. With these strict definitions of strength and force, it is then possible for a practitioner's Taiji's defense-offense ability to be adequately quantified. Jie Gu, et. al.² also discussed the mechanical mechanism of “explosive” and “sequential” strength, where explosive strength was defined as a relative momentum (in other words, the release strength, by the relative motion among the body parts) and sequential strength as supporting momentum, which can be described as the gradual release of energy, which stems from the supporting area of the body through the body part delivering the energy and its delivery to the opponent.

In this way, internal force and internal strength are the internal quantities of the human body, but they fully conform to previous accepted definitions of mechanics.

External force thus refers to the exertion of external forces on the human body, such as gravity, friction, and normal, perpendicular forces on the soles of the feet (such as those exerted on and from the ground). External momentum are those that collide with the human body.

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In terms of strength, the opponent's strength may also act on us the defender's balance and influence the defender's mobility. It should be noted in this model the internal force/strength and the external force/strength have exactly the same mechanical definition. The difference is only that the former acts on the inside of the human body, and the latter is the external exertion on the human body.

Jie Gu et. al.^{3,4} then introduced, for the first time, the human body plane rigid body model to the study of Taiji. This model includes several parameters that relate to the human frame, mass, speed, horizontal attack force, gravity, ground reaction force, friction force and several other secondary factors.

Applying this model to the mechanical analysis of Taiji under the action of horizontal force, five important conclusions could be drawn: the center of gravity of the human body must be within what was termed the *Support Surface*, which is usually the ground, in order to maintain balance; foot slip and root loss (root loss being when the normal force equals zero, which means the foot is in the air, without contact force to the floor) are considered to be critical conditions for maintaining balance: the human body is balanced within critical conditions, exceeding any critical condition will cause the human body to lose balance, and put the practitioner at a major disadvantage; the horizontal attack force depends on the friction force of the soles of the feet, the overall momentum of the human body and the momentum of the relative movement of the limbs; internal force creates momentum and transmission force.

In prior studies, the mechanical principles of technical skills such as the moves known as "throw like an arrow", "introduce to empty", and "four ounce deflect thousand strength" were also demonstrated, with numerical examples, and these were then developed and modeled. The analysis showed that with a lower bow stance, it was possible to generate a greater horizontal delivered pushing force; and a lower sitting stance permitted the practitioner to generate a greater horizontal pulling force, which means, the lower the stance, the greater the

delivered force, but this is only achieved with a reduction in flexibility and mobility.

The higher the stance, the lower the delivered force, but the higher the flexibility. Thus, a middle stance takes into account the advantages and disadvantage of various aspects.

In further studies by Jie Gu⁵ it was demonstrated that a middle stance of Yang Taiji is optimal for both self-cultivation and martial arts practice, through quantitative analysis of knee bending and internal force. This differs from prior studies, which were unable to define the advantages quantitatively.

Since these studies various incremental improvements have consistently been made to the model⁶⁻⁸. In the prior studies, the force in martial arts comes from three *sources*: a transmission force, the overall impact force and the relative impact force. Also studied were the influence of the "three sources of force" (Supporting frame force, overall body momentum force, and a force linked to the relative momentum between body parts) used in the Yang Chengfu Taiji's bow stance on a pushing force. The conclusion is that the bow stance is suitable for delivering a net pushing force, and the "three sources of power" all increase the ability of the bow stance to generate a pushing force.

The literature analyzed the influence of the "three sources of force" on the pulling force in the Yang Chengfu Taiji's sit stance. The conclusion is that a sit stance is suitable for delivering pulling force, and the "three sources of power" all increase the ability of the sit stance to generate pulling force.

Finally, study⁹ extended the horizontal force model that was introduced in Jie Gu³ to a three-dimensional force model. In this, the mechanical principle of the human body model under the action of horizontal, vertical and lateral forces was demonstrated. The quantitative analysis formulas of stability, lost root and slipping critical conditions were also deduced, which brought the model closer to reality and created better universal significance.

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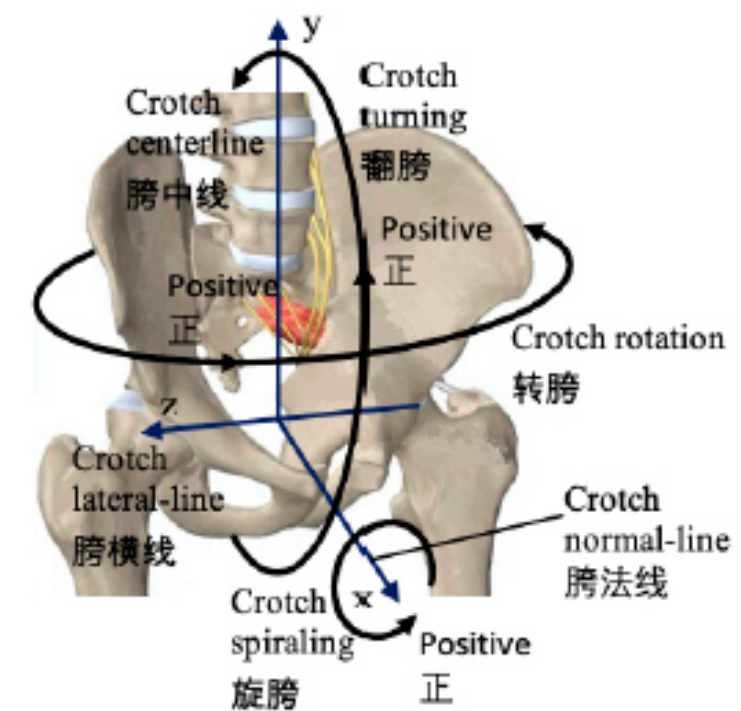


Fig. 1. Image showing spiraling, rotating and turning motions around the crotch.

This was further improved in a study that established a 3D rigid body model of the human body, and introduced the dimension of the depth direction, and added a moment vector to the external force¹⁰.

It is sometimes said that Taiji is a martial art that involves both "moving with every body part and stillness with every body part"¹¹. To match the "stillness" component, the human body is considered to be a rigid body with a defined mass and six degrees of freedom, and the connecting hand is a rigid body, with its own mass and six degrees of freedom.

In this model, a generalized force that is composed of three directional forces (in the x y and z directions) and three moments (where the moments describe spiraling or wrapping actions) is developed that permits the model to include all the possible forces in any direction. These forces act together on the human body.

The generalized force can be used to simulate the directional defense and

offensive ability of Taiji and the generated model includes the spiral effect of thread drawing and thread wrapping (by taking into account the orientation, motion and the corresponding moments).

The advantage is the developed 3D model concisely includes the frame of the human body, the overall mass, the connecting hand mass, the overall moment of inertia, the connecting hand moment of inertia, the overall motion, the connecting hand motion, the overall rotation, the connecting hand rotation, the attack force and moment, the gravity, the ground reaction force, the friction force and many other factors.

The 3D model is also able to analyze the mechanical principles of complex movements such as turning waist, rotating crotch, and spiraling connecting hand; it analyzes the difference between along and opposite stances; it analyzes the influence of width of the stance; and thus it provides a very detailed scientific method and a solid theoretical basis for the practice and study of Taiji.

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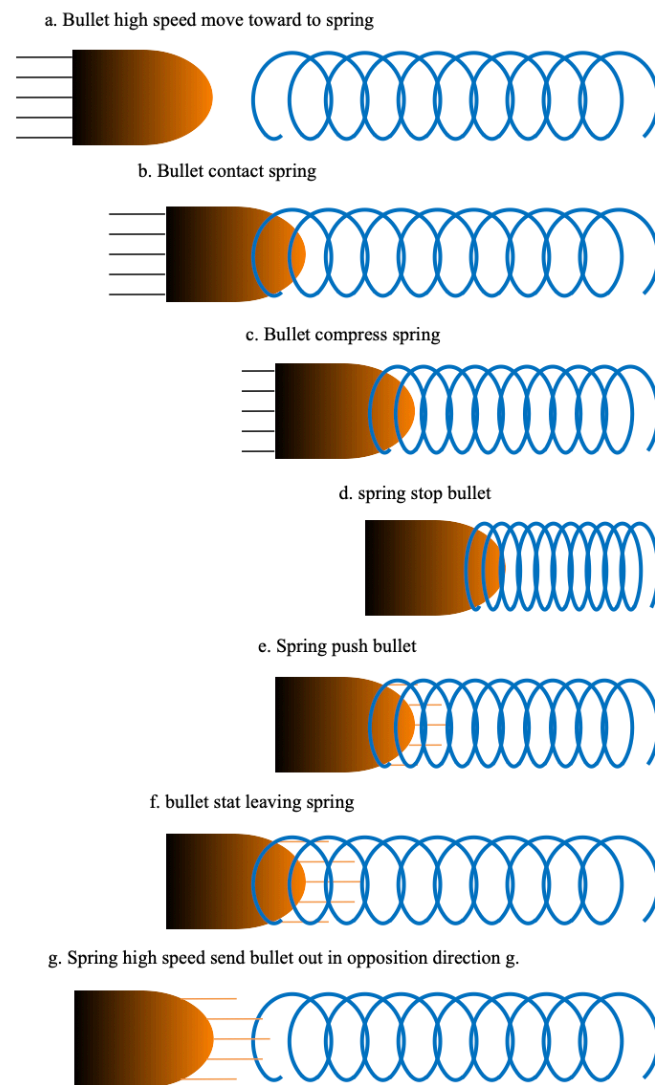


Fig. 2. Interactions between a “bullet” and a spring

The combat functionality of Taiji is most often reflected in various postures. Because internal force often arises from the actions of different body parts, which are synchronized, and combined to create an attack, Jie Gu et al.¹² then proposed an external multi-force system in the 3D model for Taiji and compiled a software program to calculate three connecting hand forces (the various force vectors).

This model expands upon the prior single force theories and concisely includes the frame of the human body and the connecting hand, translation and rotation motions,

external force and several other factors. The software is used to quantitatively analyze the dynamic and static effects of Taiji postures.

The next study¹³ outlined the mechanics of Taiji. It put forward the concept that Taiji is the spring (which means to deform like an elastic cushion and to recover). This is shown schematically in Fig. 2.

To operate at the highest level, the martial art practitioner must know oneself and one's enemy. In Taiji, the eight methods (bouncing, diverting, squeezing, pressing, grabbing, lateralizing, elbowing, and banging) are the tactical principles of Taiji; the five steps

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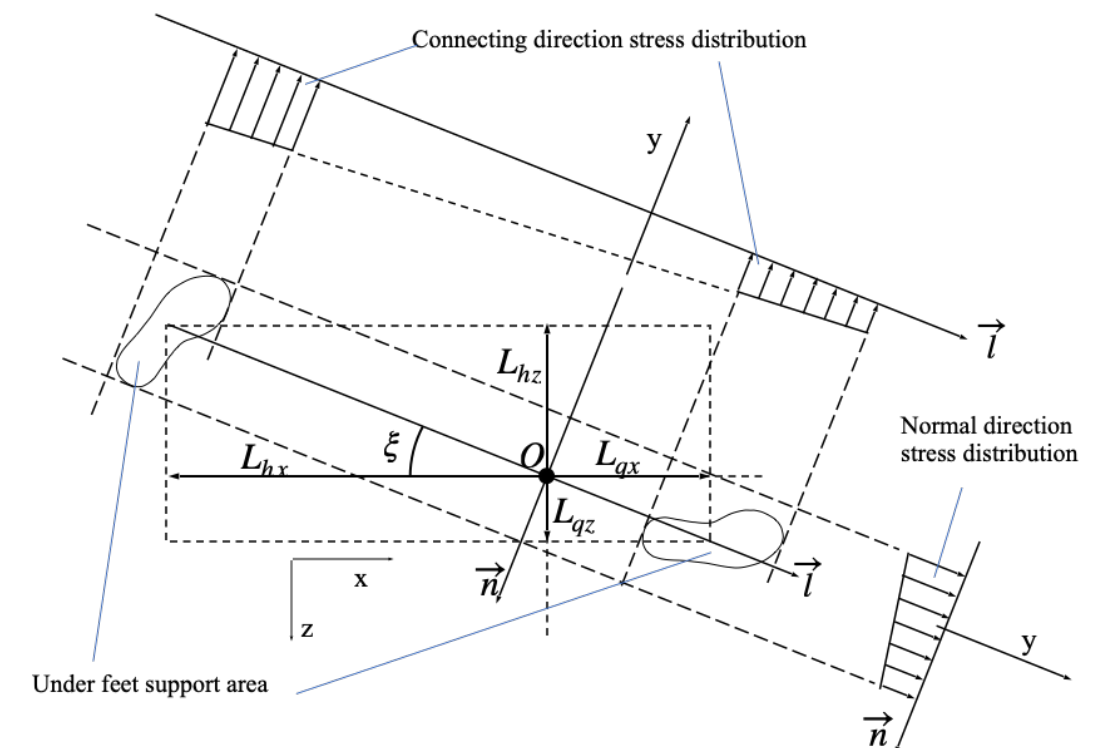


Fig. 3. View from above of the bilinear elastic stress distribution.

(forward, backward, leftward, rightward, and centering) are the balance principles; and connecting, linking, sticking and following are the strategic principles of Taiji.

Within reference 14, the authors then used the 3D model that they had developed to calculate all thirty-seven non-repetitive postures of Yang large frame Taiji.

The basic forms of Taiji are routines, weapons, push hands, and free fight; and the basic content and connotation of Taiji is postures.

In essence, Taiji postures are “extracts” of actual combat, and the sense of defense-offense is a blend in the movements of “running water and floating cloud”.

In total thirty-seven postures are compiled into the "Primary Yang's 37" routine. Through the analysis and calculation of these Primary 37 postures, it was proven that the ancient art of Taiji can be analyzed in a more scientific, standardized, and modernized manner.

In reference 15, the authors next introduced the concept of the influence of a stress distribution on the sole of the foot into the mechanical model of Taiji.

Using standard theories found in material mechanics, the mechanical stresses on the soles of the feet are assumed to be a linear elastic distribution. These stresses are distributed in a trapezoidal shape, at the practitioner's feet (Fig. 3.).

Within this model, the stress is considered to be zero *between* the two feet, and the trapezoids at both ends are connected in a straight line, and the stress at any place *on the sole of the foot* cannot be negative. This is important, because, in this way, for the first time, a stress between the person's feet and the floor was introduced into the field of elastic mechanics.

Calculations show that linear elasticity theory increases the model's accuracy, when compared with the point contact theory, which the authors had proposed earlier³. Overall, the accuracy of the point contact

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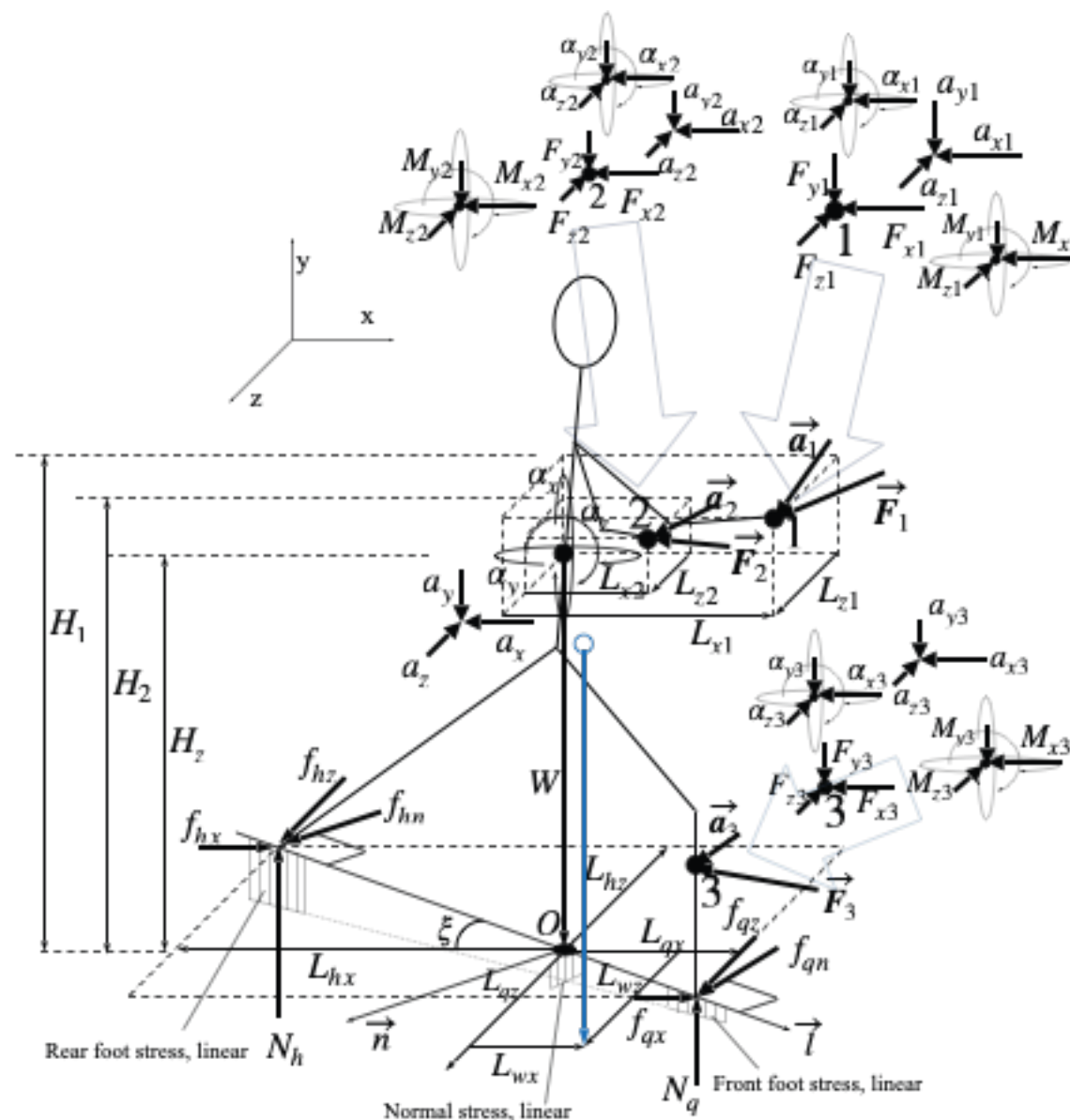


Fig. 4. Bi-elastic multiple force 3D model.

theory is considered to be very good when the distance between the feet is large, but it was still observed that the error increases when the distance between the two feet becomes closer.

The foot-ground contact surface, described in reference 15, employed two naturally separated areas: the front foot and the rear foot. However, it was noted that the problem with this approach is sometimes a practitioner may stand on only one foot, which means, in this case, there is only one grounded area.

In order to address the issue of single foot stances, the study in reference 16 discussed the influence of the continuous area of sole stress on the mechanical model of Taiji, and it divides the continuous surface into two parts based on push or pull, and the critical condition of a single foot stance was then calculated.

Reference 17 then proposed a longitudinal point and normal elastic model. In the connecting direction of the two feet, a point contact theory was used because the accuracy of the point contact theory is good

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$$\begin{aligned}
 F_x'' - f_{qx} - f_{hx} &= 0 F_x'' = \sum F_{xi}' - m_a F_{xi}' = F_{xi} - m_i a_{xi} \\
 F_y'' - N_q - N_h &= 0 F_y'' = \sum F_{yi}' - m_a F_{yi}' = F_{yi} - m_i a_{yi} \\
 F_z'' - f_{qz} - f_{hz} &= 0 F_z'' = \sum F_{zi}' - m_a F_{zi}' = F_{zi} - m_i a_{zi} \\
 \sigma &= \sigma_0 + \delta(l - l_0) \geq 0 \text{ everywhere} \\
 J_0 &= \int_q n_A dl + \int_h n_A dl \quad J_1 = \int_q l n_A dl + \int_h l n_A dl \quad J_2 = \int_q l^2 n_A dl + \int_h l^2 n_A dl \\
 \sigma_0 J_0 + \delta(l_1 - l_0 J_0) &= F_y'' l_0 = J_1 / J_0 \\
 \int_q \sigma l n_A dl + \int_h \sigma l n_A dl &= M_n \\
 M_n &= (M_y'' - \sum F_{xi}' H_i) L_{qx} / L_q + \sum F_{xi}' L_{si} + (mg - m_a y) L_w - x (M_y'' \sum F_{zi}' H_i) L_{qz} / L_q \\
 M_x'' &= \sum M_{xi} - m_a z H_z - l_x \alpha_x - \sum l_{xi} \alpha_{jxz} = M_y'' M_{zi} + m_a x H_z - l_z \alpha_z - \sum l_{zi} \alpha_{zi} \\
 M_{n0} &= -[(\sum M_{zi} - \sum F_{xi}' H_i) L_{qx} / L_q + \sum F_{xi}' L_{si} \\
 &\quad + (mg - m_a y) L_w - (\sum M_{xi} + \sum F_{xi}' L_{qz} / L_q)] \\
 L_q &= \sqrt{L_{qx}^2 + L_{qz}^2} \quad L_h = \sqrt{L_{hx}^2 + L_{hz}^2} \quad L_{si} = \frac{L_{xi} L_{qx} + L_{zi} L_{qz}}{L_q} \quad L_w = \frac{L_{wx} L_{qx} + L_{wz} L_{qz}}{L_q} \\
 \sigma_0 &= F_y'' / J_0 \quad \delta = (F_{y1}' - M_n J_0) / (J_1^2 - J_0 J_2) \\
 M_{n0} > 0 &\begin{cases} \text{front input } \sigma_{q_toe} \approx F_y'' / J_0 + (F_{y1}' - M_n J_0) (L_q + l_{qq} / J_0)^{1/2} / (J_1^2 - J_0 J_2) \geq 0 \\ \text{front critical } \sigma_{q_heel} \approx F_y'' / J_0 + (F_{y1}' - M_n J_0) (L_q - l_{qh} / J_0)^{1/2} / (J_1^2 - J_0 J_2) \geq 0 \end{cases} \\
 M_{n0} < 0 &\begin{cases} \text{rear input } \sigma_{h_heel} \approx F_y'' / J_0 + (F_{y1}' - M_n J_0) (-L_h - l_{hh} / J_0)^{1/2} / (J_1^2 - J_0 J_2) \geq 0 \\ \text{rear critical } \sigma_{h_toe} \approx F_y'' / J_0 + (F_{y1}' - M_n J_0) (-L_h + l_{hq} / J_0)^{1/2} / (J_1^2 - J_0 J_2) \geq 0 \end{cases} \\
 N_q &= \sigma_0 \int_q n_A dl + \delta \int_q (l - J_1 / J_0) n_A dl \geq 0 \quad N_h = \sigma_0 \int_h n_A dl + \delta \int_h (l - J_1 / J_0) n_A dl \\
 \begin{cases} \tan \varphi_{xz} \approx \sqrt{F_x'^2 + F_z'^2} / F_y'' \leq \mu \\ \text{if } |F_x'| + |F_z'| \neq 0 \tan \psi = F_y'' / F_z'' \\ \text{else } |F_x'| + |F_z'| = 0 \tan \psi = \psi = 0 \end{cases} &\begin{cases} f_q = N_q \tan \varphi_{xz} \quad f_h = N_h \tan \varphi_{xz} \\ f_{qx} = f_q \sin \psi \quad f_{hx} = f_h \sin \psi \\ f_{qz} = f_q \cos \psi \quad f_{hz} = f_h \cos \psi \end{cases} \\
 M_q &= \sigma_0 \int_q l n_A dl + \delta \int_q l (l - J_1 / J_0) n_A dl \quad M_h = \sigma_0 \int_h l n_A dl + \delta \int_h l (l - J_1 / J_0) n_A dl \\
 \begin{cases} L_{ql} = M_q / N_q \\ L_{hl} = M_h / N_h \end{cases} &\begin{cases} -M_y'' + M_{yy} - f_{qn} L_{qw} + f_{hn} L_{hw} + M_{fy} = 0 \\ M_y'' = \sum (M_{yi} - \alpha_{yi} l_{yi}) - \alpha_y l_y M_{yy} = -\sum F_{xi}' (L_{zi} - L_{wz}) + \sum F_{zi}' (L_{xi} - L_{wx}) \\ M_{fy} = f_{qx} (L_{ql} \sin \xi - L_{wz}) - f_{qz} (L_{ql} \cos \xi - L_{wx}) \\ -f_{hx} (-L_{hl} \sin \xi + L_{wz}) + f_{hz} (-L_{hl} \cos \xi + L_{wx}) \\ L_{qw} = \sqrt{(L_{ql} \cos \xi - L_{wx})^2 + (L_{ql} \sin \xi - L_{wz})^2} \\ L_{hw} = \sqrt{(-L_{hl} \cos \xi + L_{wx})^2 + (-L_{hl} \sin \xi + L_{wz})^2} \\ \tan \xi = L_{qz} / L_{qx} \quad f_{qn} + f_{hn} = 0 \\ \begin{cases} f_{qn} = \frac{-M_y'' + M_{yy} + M_{fy}}{L_{qw} + L_{hw}} \quad f_{hn} = \frac{-M_y'' + M_{yy} + M_{fy}}{L_{qw} + L_{hw}} \\ \tan \varphi_{qn} = f_{qn} / N_q \quad \tan \varphi_{hn} = f_{hn} / N_h \end{cases} \end{cases} \\
 f_q^2 &= (f_{qx} - f_{qn} \sin \xi)^2 + (f_{qz} + f_{qn} \cos \xi)^2 / N_q \leq \mu \\
 f_h^2 &= (f_{hx} - f_{hn} \sin \xi)^2 + (f_{hz} + f_{hn} \cos \xi)^2 / N_h \leq \mu \\
 M_{celim} &\begin{cases} M_{ce} = -\sum M_{xi}' \cos \xi - \sum M_{zi}' \sin \xi + \sum \xi_i' H_i \sin \xi - \sum \xi_i' H_i \cos \xi \\ + \sum F_{yi}' (L_{zi} \cos \xi - L_{xi} \sin \xi) + (mg - m_a y) (L_{wz} \cos \xi - L_{wx} \sin \xi) \\ - (m_a x \sin \xi - m_a z \cos \xi) H_z + l_x \alpha_x \cos \xi + l_z \alpha_z \sin \xi \\ M_{xi}' = M_{xi} - l_{xi} \alpha_{xi} \quad M_{zi}' = M_{zi} - l_{zi} \alpha_{zi} \end{cases}
 \end{aligned}$$

Fig. 5. Computational code and an example of the Application of the Taiji Model to Various Taiji Stances

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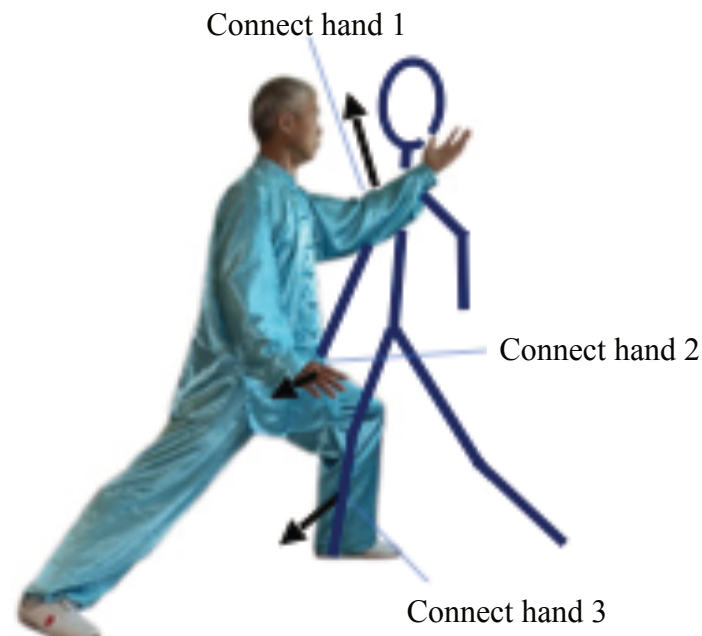


Fig. 6. Left horse part mane. Due to the initial structure used in the computer program both feet and hands and even elbows and knees were referred to as “connected hands.” This will be changed in later iterations of the program.

stance classification	1st connecting hand horizontal distance	1st connecting hand lateral distance	1st horizontal force ratio	1st vertical force ratio	1st lateral force ratio	1st horizontal force	1st vertical force	1st lateral force	Initial force/moment	Normal Stability moment
	L_{x1}	L_{y1}	$F_{x1}(1)$	$F_{y1}(2)$	$F_{x1}(3)$	F_{x1}	F_{y1}	F_{z1}		
	m	m	no	no	no	N	N	N		
left horse part mane left hand	0.4	-0.2	1	0.30	-1.5	68.3	20.5	-102.4	51.2	67.2
left horse part mane left hand and right hand	0.4	-0.2	1	0.30	-1.5	193.4	58.0	-290.1	145.0	67.2
left horse part mane left hand, right hand and left foot	0.4	-0.2	1	0.30	-1.5	252.4	75.7	-378.6	189.3	67.2

stance classification	Critical condition	front foot normal force	rear foot normal force	front foot force tangent	rear foot force tangent	moment in normal direction	2nd connecting hand height	2nd connecting hand horizontal distance	2nd connecting hand lateral distance	2nd horizontal force ratio	2nd vertical force ratio	2nd lateral force ratio
		N_{x1}	N_{y1}	$\tan \alpha_{x1}$	$\tan \alpha_{y1}$		H_2	L_{x2}	L_{y2}	$F_{x2}(7)$	$F_{y2}(8)$	$F_{z2}(9)$
		N	N	no	no		m	m	m	no	no	no
left horse part mane left hand	1N los	304.7	303.8	0.30	0.18	67.2						
left horse part mane left hand and right hand	1F sli	195.0	393.0	0.50	0.31	61.0	0.8	0.05	0.2	-0.3	-0.3	1
left horse part mane left hand, right hand and left foot	1F sli	224.8	413.7	0.50	0.21	15.2	0.8	0.05	0.2	-0.3	-0.3	1

Table 1. Three examples of force delivery within horse part mane.

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when the feet are a distance apart. In the direction normal (perpendicular) to the two feet, the contact surface (this being the ground) is considered to be continuous and it cannot be divided into two distant points. This means the normal direction must be evaluated by linear elastic theory, using the normal stabilizing moment provided in reference 16.

The model that was formed is a 3D rigid body with mass and moment of inertia. There are also the critical conditions of front and rear foot loss and slippage, plus normal instability.

This permitted the common push hand moves of the traditional Yang style to be compiled into a pairing routine. The stability and delivering force in the confrontation process were also calculated for all push hand moves by using the longitudinal point and normal elastic model.

These confrontation moves include the commence, opposite four frontals, horizontal circle single hand push, vertical circle single hand push, flip-flop single hand push, opposite double hand push, follow four frontals, live step opposite four frontals, serial step follow four frontals, large divert, closing form. A quantitative analysis of martial arts confrontation was subsequently performed, for the first time.

With the model now reasonably developed, reference 18 then applied linear elasticity theory to the connecting direction of the two feet on the basis of reference 17, see figure 5.

This revised code has now become part of a computer program to help determine the forces exerted by a practitioner during specific Taiji moves. In the following an example is given to help illustrate the calculation process.

Within reference 18, the authors applied linear elasticity theory to the connecting direction of the two feet that was previously described in reference 16. In this way, a bi-elastic linear, multi-force, 3D model was established, see Fig 5b, form which various mathematical Formulas were derived.

Specifically, Fig. 5b represents the movement left horse part mane for defense-offense. In this movement the opponent sets out his right foot and attacks with his right palm, and the defender steps out with the left foot and blocks the opponent's right foot, the defender's right hand grabs the opponent's right hand, and the left arm comes under the opponent's right arm and up towards the opponent's chest and between the armpits. Table 1 analyzes the three types of forces delivered and their combinations.

In the first movement (see row 1 in table 1), only “connected hand 1” delivers a force, that is, only the defender's left arm strikes forward, upward, and leftwards, and the ratio of the force direction vectors are $F_{x1}:F_{y1}:F_{z1}=1:0.3:-1.5$, where the subtitles $x1$, $y1$, and $z1$ represent the left hand, and $x2$, $y2$ and $z2$ the right hand. The calculated critical force, shown here in green, is $F_{x1}:F_{y1}:F_{z1}=68.3:20.5:-102.4$.

In this study, F_{z1} is the force that moves directly to the left, which acts at a height of 1.1 meters and it generates a moment of $102.4 \times 1.1 = 112.6(\text{Nm})$. This moment is much larger than the opponent's normal stabilizing moment of 67 Nm.

There is an assumption here, which is the opponent's right foot is locked by the friction force, and the defender's force and the friction force of the sole of the opponent's foot form a moment, to knock down the opponent. If the opponent responds in time and moves his right foot in the air, the attack will not achieve the expected effect.

In the second case (row 2 in the table), hands 1 and 2 deliver force together, that is, the additional right hand delivers grabbing force, and the ratio of the grabbing force direction is $F_{x2}:F_{y2}:F_{z2}=-0.3:-0.3:1$. In this case, the critical force at “connect hand 1” is calculated as $F_{x1}:F_{y1}:F_{z1}=193.4:58.0:-290.1$.

In this movement Force F_{z1} has more than doubled. In addition, the grabbing force that the right hand (connect hand 2) can deliver in this case is $F_{x2}:F_{y2}:F_{z2}=-58.0:58.0:193.4$. The lateral force F_{z2} and the lateral force F_{z1} form a lateral moment of $193.4 \times 0.3 = 58.0 \text{ Nm}$.

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stance classification	2nd horizontal force	2nd vertical force	2nd lateral force	3rd connecting hand height	3rd connecting hand horizontal distance	3rd connecting hand lateral distance	3rd horizontal force ratio	3rd vertical force ratio	3rd lateral force ratio	3rd horizontal force	3rd vertical force	3rd lateral force
	F_{x2}	F_{y2}	F_{z2}	H_3	L_{x3}	L_{y3}	$\epsilon_{x2}(13)$	$\epsilon_{y2}(14)$	$\epsilon_{z2}(15)$	F_{x3}	F_{y3}	F_{z3}
	N	N	N	m	m	m	no	no	no	N	N	N
left horse part mane left hand	0.0	0.0	0.0							0.0	0.0	0.0
left horse part mane left hand and right hand	-58.0	-58.0	193.4							0.0	0.0	0.0
left horse part mane left hand, right hand and left foot	-75.7	-75.7	252.4	0.3	0.24	-0.12	-0.1	0.2	1	-25.2	50.5	252.4

Table 1. Continued: Three examples of force delivery within horse part mane.

Overall this moment can be considered very effective. The reason is when we grab, we can intentionally add spiral wrapping, in order to turn the opponent's arm into what is termed an “anti-joint state” and the two movements, at the same time, will then have a multiplier effect.

In more detail, the defender's right hand is internally rotated, causing the opponent's right hand to be externally rotated, which will usually cause the opponent to make the decision to fall over, in order to prevent joint injury.

In addition, this anti-joint movement will help lock the opponent's right foot. The doubled lateral force of the defender's “connect hand 1” and the friction force of the opponent's sole of the foot thus forms produces a lateral moment of $290.1 \times 1.1 = 319.1$ Nm. The sum of the two moments is then $58.0 + 319.1$ Nm. This magnitude is 5 times the opponent's normal stabilizing moment, which means the probability of the opponent falling to the ground is substantial. Of course, if the opponent is fast, and the anti-joint movement is resolved in time and the right foot is withdrawn in time, there is still the possibility of escape.

In the third case (row 3 in table1), connect hand 1 and 2 and 3 all act to together to deliver a combined force. That is, the additional left foot delivers a blocking force, where the ratio of the blocking force vectors are measured to be $F_{x3}:F_{y3}:F_{z3}=-0.1:0.2:1$.

In this case, with the addition of the x_3, y_3 , and z_3 components, the calculated critical force at connect hand 1, along the three now rises to $F_{x1}:F_{y1}:F_{z1}=252.4:75.7:-378.6$.

As can be seen, force along the F_{z1} direction has increased by a substantial amount. The calculated critical force at connect hand 2 is $F_{x2}:F_{y2}:F_{z2}=-75.7:-75.7:252.4$; and the lateral grabbing force F_{z2} has also increased.

In addition, the blocking force that the left foot (which the preliminary computer program calls “Connect Hand 3”) is able to deliver is $F_{x3}:F_{y3}:F_{z3}=-25.2:50.5:252.4$.

Though it is possible to describe here the various forces generated in more detail, this has been done in prior publications, and the important point is this data produces a mathematical description, which confirms that because the total deliverable moment at 492.2 Nm is 7 times greater than the opponent's normal stabilizing moment, this move creates a grabbing, anti-joint function that also intercepts the possibility of the opponent making an escape. In this three-way, simultaneous attack, the opponent will fall. This use of a mathematical approach can thus assist practitioners in determine the optimal approach to use, and it is possible that it may aid in the development of new more efficient moves.

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Analysis and Reflections on the Scientific Research of Taijiquan in China

Dawei Yang

Abstract—Taichiquan has recently come to the attention of the world's scientific community, and within this community there exists diverse development trends. Based on an analysis of the published research papers within and outside of China, this paper discusses the institutional factors, internal factors and external factors that affect the development of Taijiquan scientific research. From there are three suggestions: First, through establishing a research paradigm based on life science and body experience, we may find the reason why Taijiquan has so many benefits in the physical and mental health for humans. Secondly, we should pay attention to intervention in the whole process of overall medical treatment (this includes preventive-care, general healthcare, diagnosis, treatment and rehabilitation through Taijiquan health promoting); and third the standardization of the basic concepts of Taijiquan is a rich area for further research that can act as a reference for the future scientific research of Taijiquan.

Introduction

With the successful launch of the World Taiji Science Federation" and the "International Taiji Science Forum", Taijiquan has gained more attention from the global science community, and it is already clear that a new chapter has opened for the scientific research of Taijiquan.

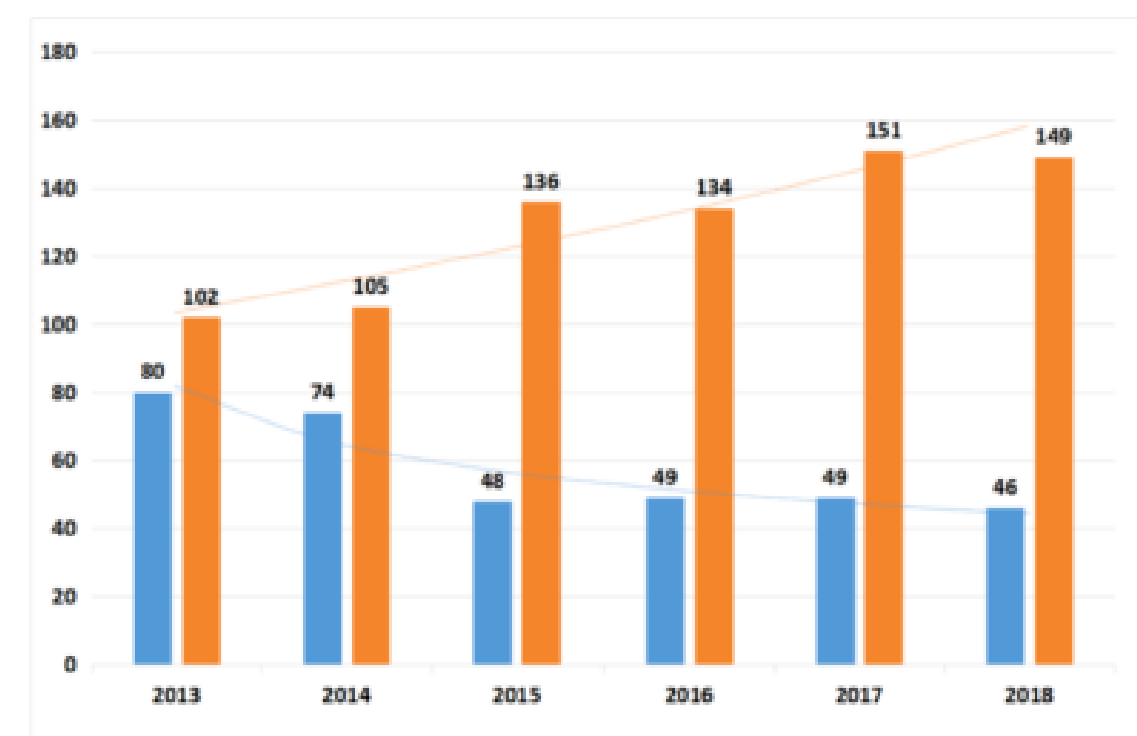
In the past two decades, academic research on Taijiquan has ranged from its cultural

communication, education & inheritance, technical research, and studies in scientific fitness and the underlying health mechanisms; to interdisciplinary research fields, which study biochemical and medical effects, physical integration, rehabilitation, medical intervention, medical care, mental psychology, neurocognition, brain remodeling and cell health. As a result of these efforts, many groundbreaking science-based achievements have been made. For the future, a type of blueprint and trajectory can now be drawn, where physical laws, and new research areas may be identified using a modern, science-based approach for the research of Taijiquan. It is expected that, both within China and abroad, there will be a rapid increase in the number of published papers that use modern scientific principles to study Taijiquan; and the presence of various different research efforts in Taijiquan research will result in not only an increase in new discoveries, but also an increase in the number of institutions participating in collaborative Taijiquan research.

More published papers on scientific research of Taijiquan outside of China

According to our observation, the most recent five year period, from 2013 to 2018, saw a broad, general growth in the number of papers on Taijiquan research published by international academic journals, with the greatest growth occurring in the United States (Fig. 1). New research centers also began to take root for the first time in Australia, South Korea, Canada, Turkey, the United Kingdom, Japan and Germany, to

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Comparison chart of quantity change trend of research literature on Taiji in China and at abroad from 2013 to 2018. China, Abroad

Fig. 1

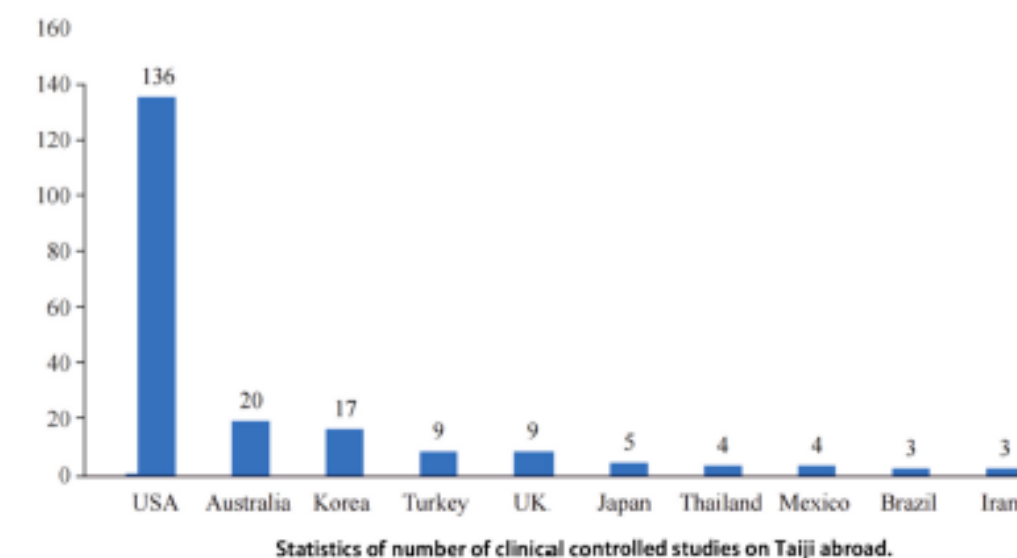


Fig. 2

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name just a few countries. However, within the same study there was observed a worrying decrease in the number of scientific papers produced in China (Fig. 2). Despite this, the overall total in the number of papers published remained flat, at circa 180 papers per year: this is because of the greater visibility of Taijiquan internationally. Within the US, there was a sharp increase, which was mainly driven by the development of new theories, new scientific tools, and the use of computer-based studies to analyze and model in greater detail the mental, physical benefits of Taijiquan. This was despite there being no dedicated research journal for research scientists to publish their work. With the launch of the Journal of Taiji Science in 2022, it will be interesting to see if there is an increase in the number of papers published, as research scientists begin to locate new avenues for collaborative research, and identify new areas to raise research funding.

Different focuses of Taijiquan research in China and abroad

In the studied five-year period, within China Taijiquan was mainly studied as a “sports and cultural event”, while outside of China it has traditionally been viewed more as a means for low-cost medical treatment and for the efficient promotion of health. Another difference is in the field of Taijiquan and health, Chinese research focuses more on physical fitness, whereas in other countries the research focuses is on the treatment of clinical symptoms. In terms of research hotspots, Chinese researchers are more interested in the sports science system, the international communication of Taijiquan, and its use within the public sphere (for example in dance and yoga, etc.); in contrast, research undertaken in other countries shows a greater interest in the health benefits of Taijiquan for example as an effective treatment for some specific types of depression, and in therapeutic improvements, it is also used as an “alternative medicine”, and for general cardio improvements that can be assisted by low-impact exercises.

The number of academic institutions participating in Taijiquan research at home and abroad is increasing

Over the past decade, it was observed that the research of Taijiquan in China was mainly carried out by individual scholars, or by independent researchers who work either at physical education institutions of higher learning, or within the universities researching traditional Chinese medicine. Few interdisciplinary research groups were involved. This is a problem, because this isolation of research scientists acts to prevent the transfer of new research ideas between different research groups.

In contrast, in studies looking at the effectiveness of Taijiquan for clinical intervention, overseas research was mainly undertaken by research teams and by interdisciplinary groups. Some of these studies have also been undertaken at prestigious research institutes, such as the research groups working at Harvard Medical School, Oregon Research Institute, Tufts University School of Medicine, Emory School of Medicine the University of Sydney, and the various Universities of California, with some institutions now holding decades of trace records (Fig. 3).

This reveals Taijiquan has gained more attention and is now considered to be a fertile and acceptable area for research within the global science community, and the momentum driving Taijiquan research has now diversified to the point it is now becoming a well-accepted interdisciplinary research subject, that covers a wide range of research areas. Many new scientific research studies of Taijiquan are thus advancing internationally, not only within the medical field, but also within engineering and in computational analysis, and each study has its own merit.

It is also noted that the many different cultural and social backgrounds present in various countries are clearly influencing how research projects are developing. These different insights are not always a disadvantage, and the differences can bring great potential for the development of Taijiquan, and Chinese culture.

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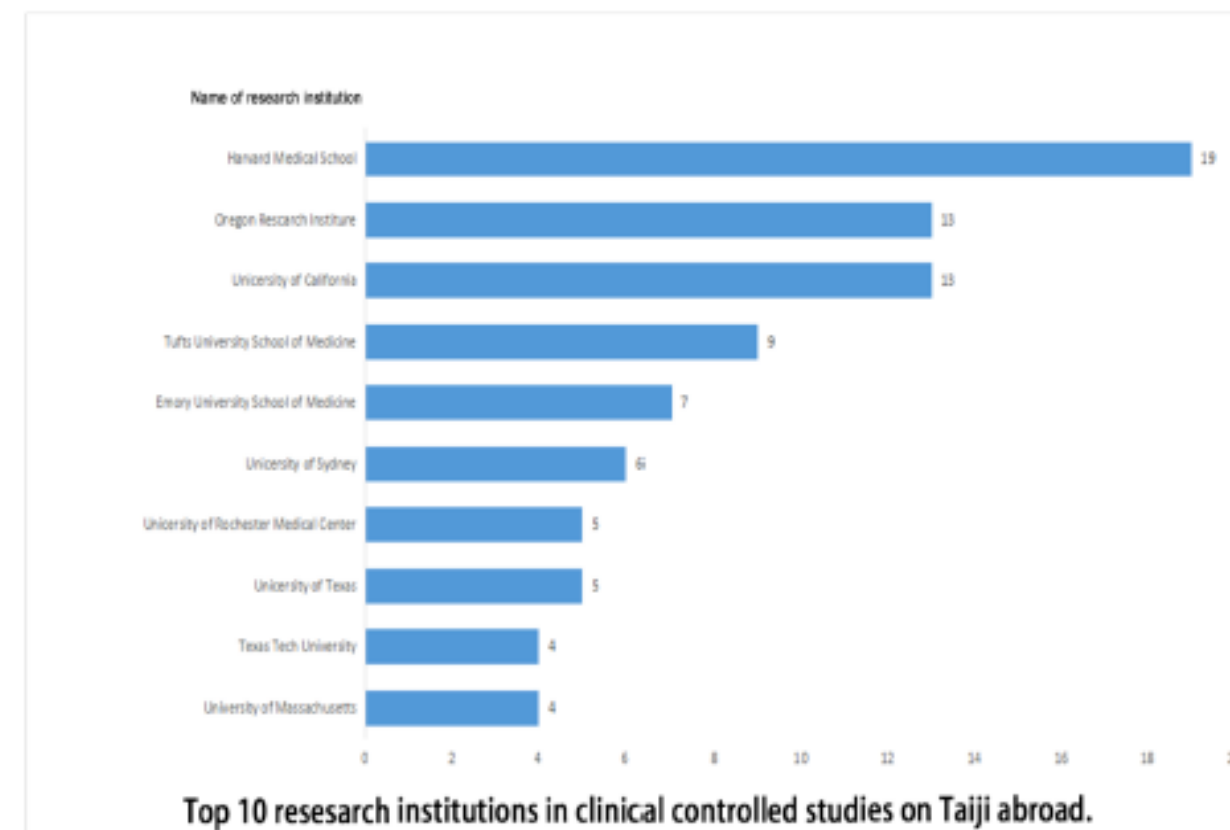


Fig. 3

The differences in the research on health promotion of Taijiquan within China and abroad.

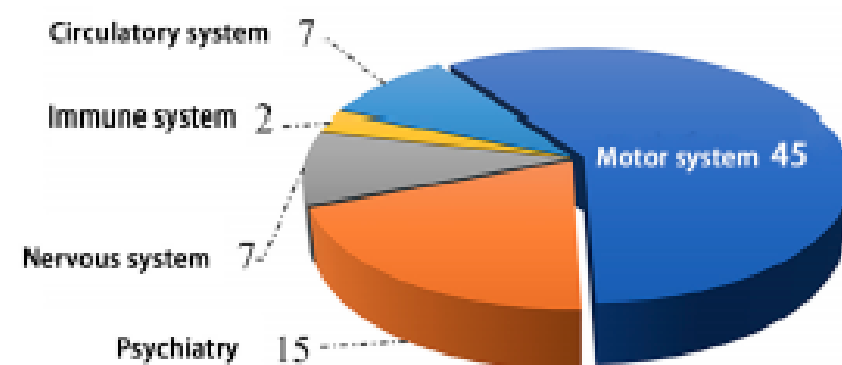
Taijiquan research within China and abroad have roughly the same clinical experiment scope, but in general the research fields outside of China are more extensive and diversified. Looking back over the last few decades, within China and within international research centers the research of disease intervention and clinical experiment involving Taijiquan has gone through four stages; the initial research into motor control involving balance, restricted movement, falls, gait; the prevention and treatment of chronic diseases, such as osteoarthritis, Parkinson's disease, heart failure and hypertension; the research of diabetes, musculoskeletal system diseases; and then most recently the research into the effect of Taijiquan on the immune system, and its effects on psychosocial diseases, like insomnia, anxiety, depression, and autism. In the past 25 years, we were able to record a

total of 209 scientific research programs on Taijiquan that were undertaken outside of China. About 47 of these studies review its influence on various diseases. These covered roughly the same scope and research fields as those undertaken in China (Fig. 4).

Other overseas research shows Taijiquan also had a positive effect on the improvement of lower urinary tract symptoms in elderly patients with benign prostatic hypertrophy (Eun-Nam Lee, 2012); Taijiquan had good therapeutic effect on elderly patients with periodontal disease (Víctor Manuel Mendoza-Núñez, 2014); it could effectively improve the withdrawal symptoms of alcohol dependent patients (Chung-uk Oh, 2016); and Taijiquan was therapeutically effective on attention deficit hyperactivity disorder in school adolescents (Alexander K. Converse, 2020). In addition, Taijiquan was also reported to affect the intestinal flora of general population, the remodeling of the cerebral motor cortex, and the changes in cell gene expression.

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A Human system of healthy subjects
Human System of Healthy Subjects



Statistics of Top 10 Subjects of Disease

B

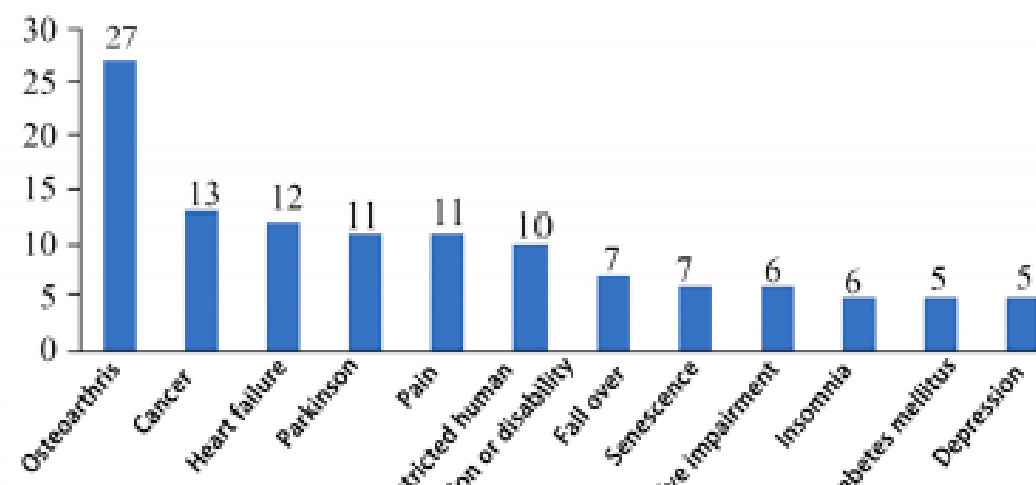
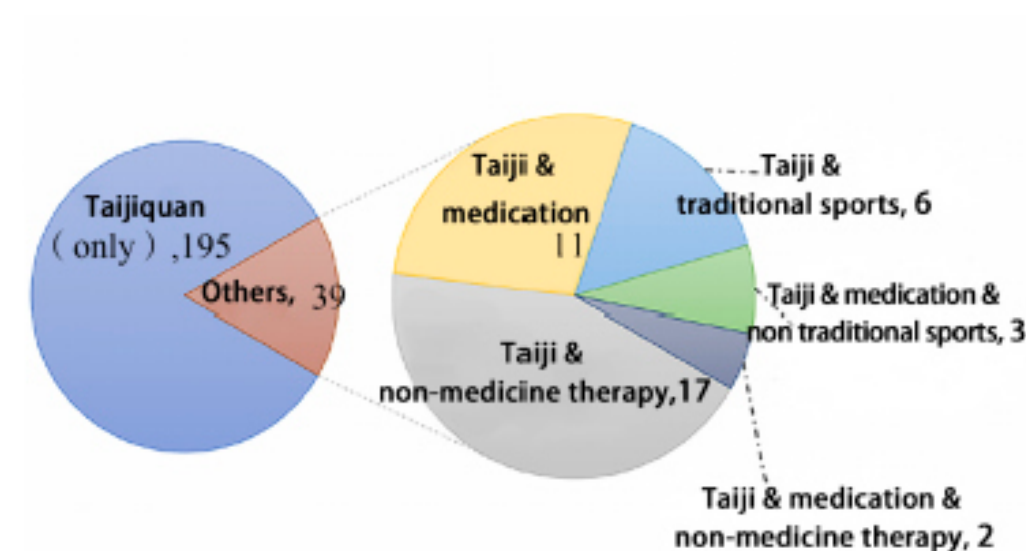
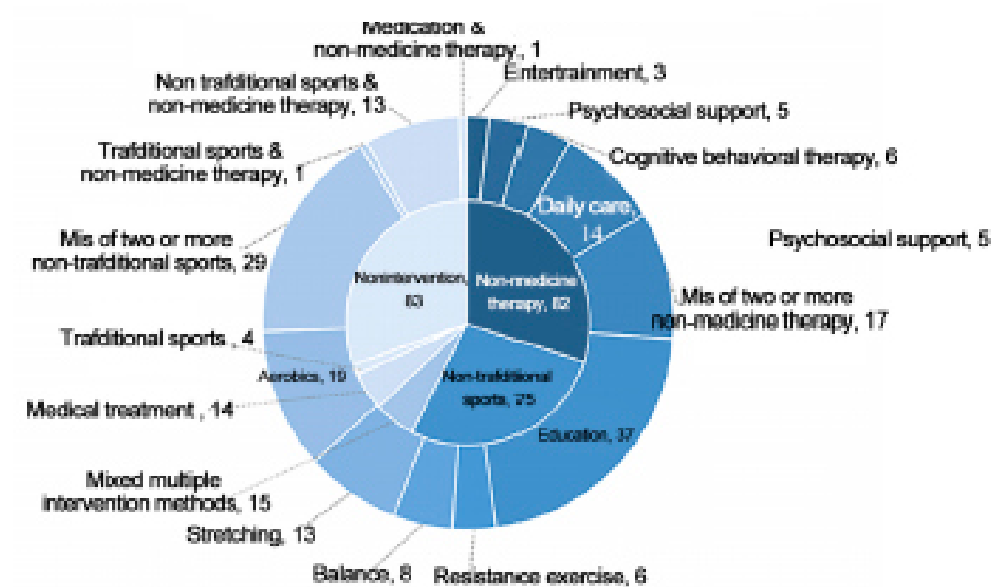


Fig. 4 and b. Research objects of clinical controlled studies on Taiji outside of China. Note, there were three cross studies in psychiatry and motor systems (which repeated 3 times), three cross studies in motor systems and circulatory systems (repeated 3 times), there was one cross study in the motor system and nervous system (repeat count 1 time) and there was one cross study in the Immune system and psychiatry (repeat count 1 time).

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5a. Intervention Methods in the Treatment Group



5b. Intervention Methods in the Control Group

The setting of treatment groups and control groups in clinical controlled studies on taiji abroad

Fig. 5

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2.2 The differences in experimental methods, research objects and results of clinical intervention of Taijiquan in China and abroad.

The clinical experimental research studies on health intervention of Taijiquan show a surprising consistency in research subject, experimental methods and conclusions: First of all, symptomatic patients were usually taken as research subjects, and clinical control researchers usually studied healthy people, such as teenagers, practitioners of Taiji, or both healthy or sick people who have long practice Taiji. Secondly, a simple control study is adopted in most research methods by dividing the subjects into the group practicing Taijiquan and a group refraining from Taijiquan or exercise. Other factors like psychological training and self-healing capacity enhancement are often ignored in the reference indicators and analysis indicators of experimental research. Finally, it is found that all conclusions for clinical research of Taijiquan in China are again surprisingly consistent, and show that Taijiquan has a significant positive role in the intervention of different diseases. Most Chinese research groups select simplified 24-style Taijiquan and 48-style Taijiquan in their studies, with some focusing on Taijizhuang, Taijicaio, and other physical activities.

For clinical intervention research of Taijiquan by research groups outside of China, the subjects are again divided into healthy people and patients. In terms of other control indicators of Taijiquan intervention treatment, research groups also reviewed the direct comparisons between Taijiquan therapy and drug treatment, and non-drug treatment; the differences between Taijiquan and various sports, and other traditional sports; and between social psychological support and cognitive behavior therapy. The intervention indicators of Taijiquan technology have also been divided into Taiji schools, Taijiquan practice duration, practice cycle and practice frequency. For selection of Taijiquan schools, different schools of Taijiquan were also adopted for the intervention control study of the same disease (Fig 5, and 6).

Among 209 overseas clinical research reports on Taijiquan over the past 25 years, 90% of the research results showed that the effect of Taijiquan group, or Taijiquan plus other interventions, was better than that seen within the control group, 9% of the research results indicated no significant difference between the effects of Taijiquan intervention group and the control group, and 1% of the results were inconclusive. None showed any detrimental effect.

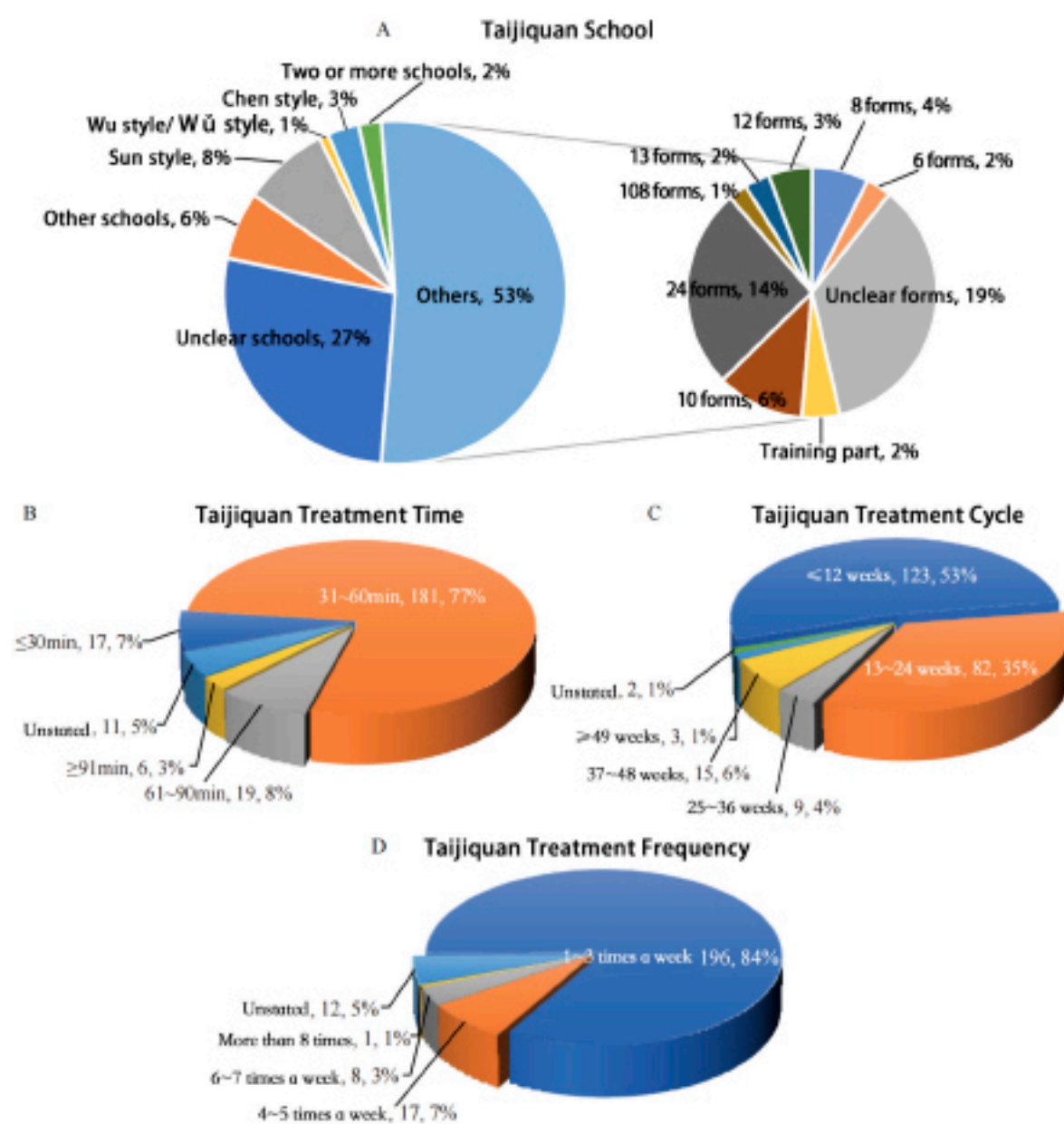
Several factors that affect the development of scientific research of Taijiquan in China.

In China, the disciplinary orientation and setting of Taijiquan research are the major institutional factors affecting the scientific research of Taijiquan.

In China, Taijiquan research is listed as a sub-program of national traditional sports, under the Sports Discipline. Although some universities treat martial arts or Taijiquan as part of national traditional sports, they generally prefer to research competitive Taijiquan.

The problem with this approach is a competition-oriented training model is unable to satisfy the average person's need for physical and mental health, nor can it assist with cultural and spiritual help, and there is a demand for diversified Taijiquan studies. Among master and doctoral students majoring in martial arts, only a small number take Taijiquan as a special subject, and few scholars take part in any interdisciplinary, or cross-international cooperation in the field of Taijiquan research.

Within China, Taijiquan is considered to be far beyond any general sports, given its value and orientation. Under the background of Chinese traditional culture, Taijiquan is more a branch of learning related to life, that is closer to life science amongst the modern science disciplines. This is because it manages to integrate together philosophy, psychology, anthropology, sociology, neurocognitive science, traditional Chinese medicine, clinical medicine, sports physiology, rehabilitation medicine and



Taijiquan intervention therapy program in the comparative studies of Taijiquan abroad

Fig. 6

other scientific research areas. In China, its restriction to a single restricted discipline limits the vision of Taijiquan research, and it is also very difficult to access academic resources and financial support from the leading universities and key national programs.

The cognitive limitations of domestic researchers on Taijiquan are the main internal factors affecting the scientific research of Taijiquan.

It is important to realize that sufficient traditional *cultural* literacy and an understanding of meditation are, from the perspective of Taijiquan, indispensable for researchers to understand and cognize Taijiquan, as a life science that is linked to physical and mental practice. With often little experience in Taijiquan techniques and its physical and mental practice, many Taijiquan researchers in China are incapable of forming any independent innovations in their research design, research methods, and research ideas. These problems might be driving the gradual decrease in the number of papers being published annually in China. On the other hand, being local and at the source of local knowledge, and being closer to the actual inheritors and thus having greater access to long-term practitioners of Taijiquan who usually have greater in-depth meditation skills and cognition of Taijiquan, there is reasons to believe this trend can be reversed, even if it has previously been noted that it is difficult for many practitioners to express their experience and to have dialogue with academics.

Of course, the enhancement of awareness of the value of Taijiquan is a society-wide issue, that is affected by the cultural popularization, education guidance, enhanced image and better training of Taijiquan. At present, most people still misunderstand Taijiquan, and the perception is only some middle-aged and elderly people agree that Taijiquan is beneficial to physical and mental health. Promotion of the Taijiquan culture is difficult throughout the society, mainly because there are not enough teachers with comprehensive knowledge and excellent skills in Taijiquan, in the Chinese education system.

The hot spot orientation of overseas Taijiquan research is an external factor that has begun to affects the scientific research of Taijiquan in China.

In previous decades, overseas research learnt from, and referenced the scientific research of Taijiquan in China, especially in clinical experimental research for health promotion. As a result, some research studies tend to be more prominent, and consequently several diseases were repetitively included in early disease intervention studies by overseas research groups. In terms of research methods, the quantitative indicators of the control study, the technical control of Taijiquan, the psychological role of patients, and other important factors affecting the rehabilitation of patients were often ignored; and not enough attention was paid to the repeatability of the experiment, the specific functions of different types of Taijiquan, and whether the clinical intervention actually produces different results. Recently, these trends are changing, with Chinese scientists recognizing the benefits of international collaborative research.

China's strategies and paths in the scientific research of Taijiquan.

The comparative analysis of the clinical experimental studies on the health promotion of Taijiquan, both in China and abroad shows that, there are many things to be discussed, with respect to the research orientation and strategies in China. As an ancient saying goes, "With copper as the mirror, you can correct your clothes; with history as the mirror, you can know the ups and downs; with people as the mirror, you can see the gains and losses." Under the exchange and collision of Chinese and Western Taijiquan studies, we now see more clearly our own shortcomings and also some of our advantages.

In general we should return to the perspective of Taijiquan itself, and focus on the study of "cause" rather than "effect" In the past ten years, a large number of clinical experiments in China and abroad have only focused on the effect of Taijiquan on disease intervention, failing to identify the root

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cause, (the biochemical and in some cases the mental cause), of "why Taijiquan is good for human body and mind", that is to say, there has been more emphasis on the effects, not the cause.

In China, Taijiquan is a life science based on the internal evidence and practice of body and mind, which has comes down in one continuous line with the theory of traditional Chinese medicine and the life-practice view of harmony between man and nature. In contrast, when western medicine is used to study traditional Chinese medicine, we often run in the opposite direction. Science and physical evidence are the two primary ways to know the truth. To reach the same goal via different approaches, we need to work together in the same direction, and not in opposite directions.

It seems that we have to return to the life experience of Taijiquan practice. It is not necessary for every researcher to need to practice Taijiquan, but the person undertaking research must work with those who do.

If we are to understand the biochemical processes that are responsible for Chi, and to link up the inner microcosm with the bigger universe, and to try to understand the body view and life view of heaven and man, body and mind, yin and yang in traditional Chinese culture there is no other way. Only be working together, can we realize the mechanism of Taijiquan health as summarized by ancient people, and understand its "physical and mental interaction" and the "harmony between nature and man". Physical and mental interaction is to balance and adjust a person's mind and body through communication and interaction by practicing Taijiquan. "Harmony between man and nature" is to deal with the relationship between our internal body and the external nature, universe and society. These ideals share common ground with the World Health Organization's definition of health.

During embodiment of Taijiquan's role in living individuals, we can note changes in both the physical and physiological data recorded in clinical experiments, the

improvement on the non-material (psychological) level, and even a moral transcendence to the realm of life. The concept of moral cultivation may sound strange to science, but the body view and life view of Taijiquan inherently stresses the influence of moral cultivation on physical and mental health - a parameter that is becoming more important in the modern stress-filled world.

We should focus on the extensive application of Taijiquan in all links of Holistic Medicine, rather than just on the clinical intervention in the rehabilitation stage.

Taijiquan can participate in the whole process of disease development: from prevention, to health care, diagnosis, and treatment, to final rehabilitation. But, its value often lies more in prevention and health care than in rehabilitation support after an illness had taken hold. In terms of the intervention and clinical research of "preventing disease", it might be promising to broaden both the scope of subjects and the research vision, and to focus on long-term follow-up studies of healthy people, Taiji groups or chronic patients.

Given the impact of COVID-19 over recent years, we have begun to defined COVID-19 as a "self-limited disease of the human body". Chinese scholars have published more than 20 papers and research reports on improving immunity and intervening in the rehabilitation treatment of late COVID-19. This should be translated and shared in the international academic community.

We should make good use of China's local resources to provide the ground for future scientific research of Taijiquan around the world.

More than 90% of Taijiquan knowledge can be considered traditional and comes from those who can be considered inheritors, practitioners or scholars of Taijiquan. Such "local knowledge" of Taijiquan is mainly derived from their physical experience of Taijiquan techniques, cultural understanding, life experience, the existence of so many individuals from different schools and groups, gives us a holographic complex

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three-dimensional image of the world of Taijiquan.

However, in this knowledge, many basic concepts and special terms of Taijiquan, like the basic definitions of the eight exerting methods, and basic concepts in the body view and life view, are *very* difficult to understand and can be easily mistranslated, misread, and misunderstood by those practicing in other countries. This can form cognitive barriers in the international communication of the benefits. China undoubtedly has great advantages in the academic application and standardization of local knowledge of Taijiquan, and it can provide more meaningful academic concepts for the worldwide research of Taijiquan.

In addition, with international research cooperation, the inheritors, social organizations and institutions of Taijiquan in China can provide more knowledgeable groups, and individual cases to expand our research horizons and scientific research fields.

The Summary & Conclusions

China's traditional culture is based on life experience and physical and mental internal evidence. China should and can establish a research paradigm that is based on life science and China's physical experience on the mechanism of Taijiquan and mental health. It is also necessary to highlight Taijiquan's unique values and advantages. Secondly, we should combine or review the link to and between traditional Chinese medicine, and extensively explore the intervention role of Taijiquan in the process of disease prevention, health care, diagnosis, treatment and rehabilitation. This may start from the Holistic Medicine of Taijiquan's intervention in health promotion, rather than just focusing on clinical experimental research in rehabilitation treatment. Finally, Chinese Taijiquan researchers should respect and learn the local knowledge of Taijiquan, to further standardize the basic concepts of Taijiquan research, and combine their knowledge to academic applications, in order to provide academic tools and a rich ground for the future scientific research of Taijiquan around the world.

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