

¹Lihong Xu^{2,*}Baolin Hu³Jing Duan⁴Yiran Li

An Empirical Study on the Relationship between Internalization and Externalization of Chinese Wushu Tacit Knowledge Transfer



Abstract: - In view of the unclear relationship between internalization and externalization of current martial arts knowledge, and the unclear interaction mechanism, this study firstly analyzes the master-apprentice model of martial arts dissemination, and then uses the questionnaire survey method, factor analysis method and structural equation model method to discuss The relationship between master-apprentice relationship, master's ability to transmit knowledge, apprentice's ability to receive knowledge, organizational culture and its characteristics, and the relationship between the tacit degree of martial arts knowledge and the internalization and externalization effects of tacit knowledge transfer, the internalization effect of martial arts tacit knowledge is obtained with influence on externalizing effects. The conclusion is that in the process of Wushu tacit knowledge transfer, the degree of internalization of tacit knowledge has a positive impact on the degree of externalization, and it is also affected by the master's ability to send knowledge, the apprentice's ability to accept knowledge, and the transfer environment.

Keywords: Neijiaquan, Tacit Knowledge, Knowledge Transfer, Internalization, Externalization.

I. INTRODUCTION

Chinese martial arts is a treasure in traditional Chinese culture. Chinese kung fu itself emphasizes technical knowledge and cultural connotation knowledge, the performance of external offensive and defensive movements, the performance of internal spirit, both internal and external, and both physical and spiritual. In modern times, Wushu is classified as national traditional sports ^[1]. Due to the influence of Western culture and competitive sports, it has gradually derived into modern martial arts ^[2], which has the ability to adapt to the development of the times and Western sports. Insufficient attention has been paid to the dissemination of tacit knowledge that is difficult to express and describe ^[3]. Neijiaquan is an important form of Chinese martial arts. It has the characteristics of complex level of knowledge, fields of knowledge, and repeated practice of key techniques.

In view of this, this study firstly refers to the tacit knowledge transfer models at home and abroad, firstly, taking Neijiaquan as an example, collects variables to construct the evaluation scale of Chinese Wushu tacit knowledge transfer effect, defines operable variables, and clarifies its connotation; then, designs a questionnaire, carry out the distribution and recovery of small and large samples of the questionnaire; conduct exploratory factor analysis under the condition that the samples are confirmed to be valid to obtain the key influencing factors and path models of the transfer of martial arts tacit knowledge; finally, construct a structural equation model to explore Chinese Kung Fu The transmission mechanism of tacit knowledge in the process of teacher-apprentice interaction, and then study the influence mechanism of the degree of internalization of tacit knowledge in Chinese martial arts on the degree of externalization, and then seek the path and mode of Chinese martial arts knowledge in a deeper level.

II. LITERATURE REVIEW

A. Related Research on Influencing Factors of Tacit Knowledge Transfer

Subsequently, different scholars gave various definitions, among which Nonaka conducted a continuous discussion on tacit knowledge and its transfer, proposed that tacit knowledge includes mental models, beliefs and know-how knowledge, and also constructed and continuously improved knowledge creation. The SECI model builds an empirical research framework for the explicitization of tacit knowledge, which provides a key reference for subsequent in-depth research by scholars.

Since then, knowledge transfer process models, knowledge transfer process models, knowledge transfer analysis models, ACT knowledge transfer models, and fermentation models have been developed. Other scholars

¹ Professor, Faculty of Physical Education, Kunming University, China

² National trainer, Yunnan Wushu Association, China

³ Southwest Forestry University, China

⁴ Faculty of Physical Education, Kunming University, China

*Corresponding author: Baolin Hu

Copyright © JES 2024 on-line : journal.esrgroups.org

believe that the implicitness of knowledge is measured by codification and specificity. The essence of knowledge transfer connects senders and receivers through intermediary media, thus forming a knowledge transfer chain ^[4].

The above scholars have studied the influencing factors of tacit knowledge transfer in different fields and industries, but few studies have paid attention to the transfer effect of Wushu tacit knowledge.

Taken together, the above studies provide an important reference for the determination of the influencing factors of tacit knowledge transfer, the design of questionnaires and the design of research hypotheses.

B. *Research on the Effect of Tacit Knowledge Transfer and Performance Evaluation Model*

The evaluation of tacit knowledge transfer performance by domestic and foreign scholars mainly takes the SECI model as the basic reference frame.

The degree of internalization and externalization of knowledge; (Kotabe, Martin & Domoto, 2010) found through empirical analysis that the characteristics of tacit knowledge must indirectly affect knowledge transfer performance through a significant negative impact on the ability to transform knowledge sources ^[5]. (Cao, Zhang & Zhao, 2013) believed that the tacit knowledge transfer process of martial arts includes a series of behaviors of master imparting knowledge and apprentice learning ^[6]. The externalization and internalization effects of knowledge transfer are affected by knowledge sources, knowledge receptors, organizational environment and its culture.

C. *Research Hypothesis*

1) *The transfer effect of martial arts knowledge*: Therefore, this paper divides the transfer effect of martial arts knowledge into the degree of internalization and the degree of externalization. The so-called internalization degree refers to: the apprentice's level of holding the martial arts knowledge, culture and skills taught by the master ^[7]; the apprentice's degree of externalization: the apprentice transfers the master's knowledge, culture and skills into language, action, The degree to which the text is expressed ^[8]. The higher the degree of internalization of the apprentice, the easier it is to express tacit knowledge in different ways such as language, action, and writing. The degree of externalization of the apprentice is affected by the degree of internalization. The higher the degree of internalization, the higher the degree of externalization.

Therefore, combined with the SCEI theoretical model, this study proposes the following research hypotheses:

Hypothesis 1 - The degree of internalization of the apprentice is proportional to the degree of externalization of the apprentice.

2) *Master's ability to transmit knowledge*: The master is the sender of knowledge transfer, and its characteristics as a knowledge source mainly include the ability to release knowledge and the willingness to transfer, which forms the master's ability to send knowledge ^[9]. The ability to release refers to the ability to interpret, encode and convey the new knowledge that it possesses through certain means, such as influence, communication or expression. The ability to release refers to the ability to extract knowledge, and it is the ability of the encoding method and carrier chosen by the knowledge sender.

Master's ability to release knowledge refers to master's systematic arrangement, refinement, and selection of methods that are easy for apprentices to accept knowledge, such as language, movement demonstrations, diagrams or some tools, etc. The stronger the master's willingness to transfer, the higher the level of the apprentice's knowledge of Neijiaquan, and the stronger the apprentice's ability to reproduce the exquisite movements and techniques of Neijiaquan, that is, the greater the degree of internalization and externalization of the apprentice is high.

Therefore, combined with the SCEI theoretical model, this study proposes the following research hypotheses:

Hypothesis 2 - The master's knowledge sending ability is proportional to the transfer effect of Wushu tacit knowledge, namely: H2a, the stronger the master's knowledge sending ability, the higher the apprentice's internalization degree; the stronger the H2b master's ability to transmit knowledge, the higher the degree of externalization of the apprentice

3) *The apprentice's ability to receive knowledge*: The apprentice's ability to receive knowledge is a relative concept to the master's ability to transmit knowledge. The apprentice's absorptive capacity refers to the apprentice's ability to accept, digest, and apply certain new knowledge from the master or tools or routines ^[10].

Therefore, combined with the SCEI theoretical model, this study proposes the following research hypotheses:

Hypothesis 3 - The apprentice's ability to receive knowledge is proportional to the transfer effect of Wushu's tacit knowledge, that is: the stronger the apprentice's ability to receive knowledge, the higher the degree of internalization of the apprentice; the stronger the H3b apprentice's ability to receive knowledge, the higher the apprentice's degree of externalization

4) *The tacit degree of knowledge*: From the perspective of knowledge flow and transformation, the process of mutual communication and discussion between teachers and apprentices is the process of knowledge transfer.

Both the master and the apprentice should put their knowledge into solving the problem, and finally, the apprentice should have the ability to solve the problem independently. It can be said that mentoring and apprentice cooperation is a microscopic knowledge transfer process.

Therefore, based on the viewpoints of the above scholars and the theoretical model of SCEI, the following research hypotheses are proposed:

Hypothesis 4 - The tacit degree of knowledge is inversely proportional to the internalization degree of Wushu tacit apprentices

5) *The relationship of trust between teachers and students*: When studying the mentoring system, foreign scholars pointed out that the relationship between mentoring and apprenticeship is based on reciprocity. The mutual contact between mentoring and apprentices is based on the equivalence of giving and repaying as the basis for the continuation of the relationship, and the relationship of reciprocity is based on trust. Only when the master trusts the apprentice will he share his tacit knowledge with the apprentice ^[11].

Therefore, based on the viewpoints of the above-mentioned scholars and the theoretical model of SCEI, the following research hypotheses are proposed:

Hypothesis 5 - The trust relationship between master and apprentice is proportional to the transfer effect of Wushu tacit knowledge, namely: H5a The closer the trust relationship between the master and the apprentice, the higher the level of internalization of the apprentice; H5b The closer the trust relationship between the master and the apprentice, the higher the apprentice's degree of externalization

6) *Organizational mechanism and cultural characteristics*: The more active cooperation, friendly trust, and innovation are encouraged in the organizational culture, the smoother the process of tacit knowledge sharing and transfer between mentors and members ^[12]. Whether in colleges or the private sector, the mentoring model is still an important model for the transfer of Chinese martial arts knowledge. The mentoring model not only has a close relationship in the practice of martial arts techniques, but also has an emotion that is close to or even surpasses that of "father and son" in life.

Therefore, based on the viewpoints of the above scholars and the theoretical model of SCEI, the following research hypotheses are proposed:

Hypothesis 6 - Organizational mechanism and cultural characteristics are proportional to the internalization degree of Wushu tacit knowledge.

III. STUDY DESIGN

A. Conceptual Model

In the process of Wushu tacit knowledge transfer. Through exchanges, dialogues, and shared experiences, the apprentices can obtain codes and integrate them into their own knowledge through communication with the master. The subject factors of master and apprentice mainly include the master's knowledge release ability and willingness to transfer as well as the apprentice's knowledge absorption ability and willingness to learn; the object factors of knowledge transfer mainly refer to the tacit degree and viscosity of knowledge ^[13]. In addition, environmental factors such as the distance between mentors and apprentices, the relationship of trust, and the culturally constrained learning atmosphere and incentive mechanism are also important factors that affect the behavior of mentoring and the process of knowledge transfer, that is, the relationship between mentoring and the cultural environment will inevitably affect knowledge. Transfer ^[14].

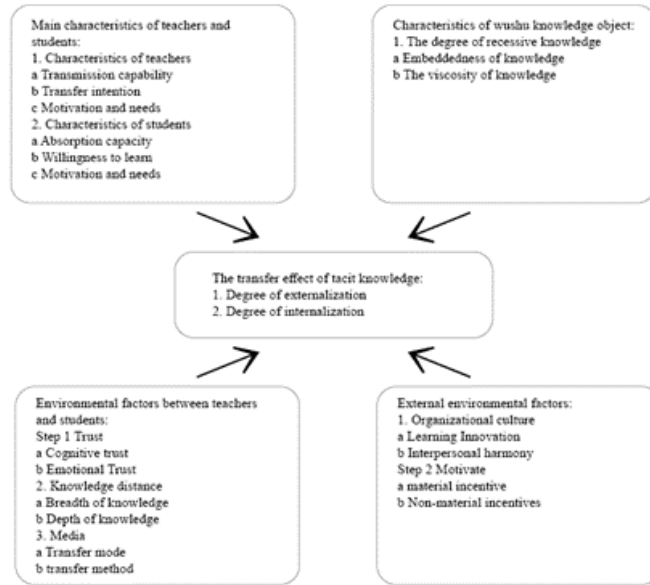


Figure 1: Conceptual Model of the Transfer of Master's Tacit Knowledge of Martial Arts to Apprentices

To sum up, the main factors and relationships that affect the effect of tacit knowledge transfer between teachers and students are shown in Figure 1.

B. Survey Objects

The surveyed objects in this research have a mentor-apprentice relationship or a mentor-apprentice status. A total of 1,200 questionnaires were distributed in the formal questionnaire survey.

We-chat survey was used for the large sample, and the incomplete questionnaires were excluded. Among them, 600 for master and 600 for apprentice. The mutual evaluation of master and apprentice corresponds to one-to-one questionnaires. In the end, 1,016 questionnaires were returned, and the effective questionnaire rate was 84.67%. Small sample testing provides high-quality items for large sample testing.

C. Questionnaire Design

In this study, a Likert scale of 1-7 was used, which was divided into 1-7 levels. The higher the score, the higher the recognition or satisfaction of the question. According to the number of observed variables in the structural equation model, the minimum sample size must not be less than 10 times the number of observed variables. Therefore, the minimum sample size should be controlled at more than 360 copies. Considering the loss of questionnaires, it can be increased. 10% sample size^[15], therefore, the minimum sample size is 396 copies. For this reason, the sample size of this study should not be less than 396. The larger the final sample size, the better, provided the minimum sample size is met. The small sample size determined in this study is 250, and the large sample size is 1200 (greater than 400).

1) *Reliability test*: The reliability of the questionnaire refers to the repeatability of the results measured by the questionnaire, and the results of the questionnaires issued multiple times have small differences, that is, the degree of difference between the data obtained from the questionnaire on the transfer effect of martial arts tacit knowledge and its average value (Tavakol & Dennick, 2011).

The most commonly used reliability measure at present is Cronbach's alpha, which is combined with CITC analysis to purify the scale.

2) *Validity test*: After determining the reliability of the questionnaire, it is also necessary to consider the difference between the data obtained from the questionnaire on the transfer effect of Wushu tacit knowledge and the ideal value. At present, there are many methods to test the data validity of the questionnaire. In this study, KMO (Kaiser Meyer Olkin) and spherical Bartlett test were used to complete the validity test of the questionnaire.

3) *Pre-experimental result*: According to the test results obtained in Table 1, after passing the pre-test, the second item in the apprentice's internalization degree, the fourth item in the apprentice's externalization degree, the sixth item in the master's knowledge transmission ability, and the teacher's The 5th item in the trust relationship between disciples and the 6th item in the tacit degree of martial arts knowledge are deleted. The deleted questionnaire was reduced from 35 items to 31 items. After deleting the corresponding items, a new questionnaire was formed, and then a large sample was collected to test the reliability and validity. The results of

the large sample reliability, validity and CITC value analysis showed that some items were suggested to be deleted. For better factor analysis, I4, W6, T5 and G3 were deleted after accepting the suggestion. From the reliability and validity of the large sample, follow-up exploratory factor analysis and confirmatory factor analysis can be carried out.

Table 1: Sample Statistical Analysis Information

Concept	Question number	mean	CITC	Reliability and validity after item removal correction	
				Cronbach's α	KMO
The degree of internalization of the apprentice	I1	4.46	0.721	0.757	0.814
	I2	4.40	0.310	0.875	
	I3	4.71	0.790	0.736	
	I4	4.93	0.677	0.773	
	I5	4.90	0.642	0.782	
The degree of externalization of the apprentice	W1	5.00	0.682	0.836	0.815
	W2	5.25	0.782	0.819	
	W3	5.08	0.726	0.827	
	W4	4.81	0.325	0.897	
	W5	5.15	0.820	0.810	
	W6	4.91	0.651	0.841	
Organizational Mechanisms and Cultural Characteristics	O1	5.09	0.694	0.884	0.804
	O2	4.95	0.800	0.844	
	O3	5.17	0.823	0.836	
	O4	5.30	0.727	0.872	
Master's ability to transmit knowledge	T1	5.15	0.697	0.854	0.804
	T2	5.12	0.724	0.849	
	T3	5.26	0.759	0.844	
	T4	5.14	0.802	0.835	
	T5	4.90	0.707	0.852	
	T6	4.23	0.446	0.898	
Apprentice's Knowledge Receiving Ability	S1	5.01	0.698	0.792	0.788
	S2	5.13	0.723	0.781	
	S3	5.17	0.669	0.805	
	S4	5.40	0.623	0.824	
The relationship of trust between teachers and students	R1	5.08	0.699	0.787	0.842
	R2	4.94	0.793	0.757	
	R3	5.01	0.762	0.771	
	R4	5.11	0.700	0.787	
	R5	4.63	0.319	0.897	
The hidden degree of martial arts knowledge	G1	4.95	0.758	0.846	0.861
	G2	5.17	0.717	0.853	
	G3	5.12	0.704	0.855	
	G4	5.03	0.746	0.847	
	G5	5.19	0.755	0.846	
	G6	4.91	0.497	0.897	

D. Statistical Methods

This study uses empirical analysis to verify the model hypothesis, which is mainly divided into two parts, exploratory factor analysis and confirmatory factor analysis. The basic framework consists of the following:

The structural model describes the relationship between latent variables in the tacit knowledge transfer effect evaluation model, as shown in formula (1).

$$\eta = \beta\eta + \Gamma\xi + \xi \tag{1}$$

The meanings of the parameters η , β , ξ , ζ and T of formula (1) are: η is an $m \times 1$ vector composed of m endogenous latent variables in the tacit knowledge transfer effect model; ξ is a vector composed of n exogenous variables. $n \times 1$ vector composed of latent variables; T is $m \times n$ structure coefficient matrix; ζ is $m \times 1$ residual vector of tacit knowledge transfer effect structure model.

Since PLS is used to solve the problem of non-normal distribution of samples, PLS represents a recursive relationship, combined with formula (1), so there are (2).

$$\eta_j = \sum_i \beta_{ji} \eta_i + \sum_b \gamma_{jb} \xi_b + \zeta_j \tag{2}$$

In formula (2), parameter β_{ji} and parameter γ_{jb} are the coefficients of endogenous variables and exogenous latent variables in the structural equation model of tacit knowledge transfer effect, ζ_j is the endogenous residual variable, and the relationship between the variables can be expressed as follows, in which Figure 2 shows:

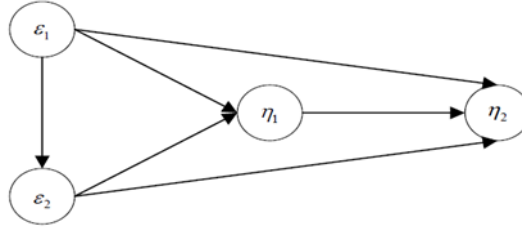


Figure 2: Structural Equation Model

As shown in Figure 2, the relationship can be represented by a matrix, as follows:

$$\begin{pmatrix} \eta_1 \\ \eta_2 \end{pmatrix} = \begin{pmatrix} 0 & 0 \\ \beta_{21} & 0 \end{pmatrix} \begin{pmatrix} \eta_1 \\ \eta_2 \end{pmatrix} + \begin{pmatrix} \gamma_{11} & \gamma_{21} \\ \gamma_{21} & \gamma_{22} \end{pmatrix} \begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \end{pmatrix} + \begin{pmatrix} \zeta_1 \\ \zeta_2 \end{pmatrix}$$

The expected solution analysis of Eq. (2) can obtain Eq. (3)

$$E(\beta_j | \forall \eta_j, \xi_b) = \sum \eta_j + \sum i \xi_b \tag{3}$$

According to the basic concept of the structural model in the structural equation model, it can be assumed that the residual term ζ is not related to the exogenous latent variable ξ , so formula (3) can obtain formula (4) and formula (5).

$$E(\zeta_j | \forall \eta_i, \varepsilon_b) = 0 \tag{4}$$

$$\text{cov}(\zeta_j, \eta_i) = \text{cov}(\zeta_j, \varepsilon_b) = 0 \tag{5}$$

On this basis, formula (6) can be further obtained, and the specific relationship is as follows:

$$\eta = (I - \beta) - \Gamma \xi + (I - \beta) - 1 \xi = \beta^* \xi + \zeta \tag{6}$$

The measurement model, which describes the relationship between the observed variable and its latent variable in the tacit knowledge transfer effect model, can be expressed by Equation (7) and Equation (8).

$$X = \Lambda \xi + \varepsilon_x \tag{7}$$

$$Y = \Lambda \eta + \varepsilon_y \tag{8}$$

Among them, x and y can represent the observed variables of the exogenous and endogenous latent variables ξ , η of the tacit knowledge transfer effect model respectively, $\Lambda \eta$ is the $q \times n$ path coefficient matrix of the variable X on ξ , $\Lambda \xi$ is the variable Y on η A $p \times m$ factor loading matrix on.

IV. FINDING

A. Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) is that researchers use a set of independent items or measurement indicators to determine a structure that has both quantitative rationality and theoretical applicability by subjective judgment, and uses it.

The structure to represent the construct or conceptual content of the measurement. Exploratory factor analysis was performed based on the data obtained from a large sample, and the results are shown in Table 2.

Table 2: Exploratory Factor Analysis Results

Concept	Cumulative variance contribution rate (%)
The degree of internalization of the apprentice	73.61
The degree of externalization of the apprentice	68.11
Master's ability to transmit knowledge	68.57
Apprentice's Knowledge Receiving Ability	65.74
The relationship of trust between teachers and students	70.62
The hidden degree of martial arts knowledge	65.38
Organizational Mechanisms and Cultural Characteristics	72.70

According to Table 2, the cumulative variance contribution rate is also between 65% and 74%. Factor analysis can be carried out, and the factor loading coefficients obtained by the factor analysis are all above 0.5. The information contained in all factors can better reflect the tacit knowledge of martial arts. Transfer assessment indicator information. From the factor load of influencing factors: the key influencing factor of the apprentice's internalization degree is the degree of understanding and comprehension; the key influencing factor of the apprentice's externalization degree is the formation of written materials for Neijiaquan learning and training; the master's ability to transmit knowledge The key influencing factor is the initiative to transfer; the key influencing factor of the apprentice's knowledge receiving ability is the willingness to improve; the key influencing factor of the trust relationship between the master and the apprentice is the mutual learning and external communication between the master and the apprentice; the key influence of the implicit degree of martial arts knowledge The factor is the difficulty of repeated practice and comprehension; the key influencing factor of organizational mechanism and cultural characteristics is the mentoring model support system.

B. Confirmatory Factor Analysis

The structural equation model was evaluated by the AMOS 17.0 software. Due to the good normality of the measured variables, the maximum likelihood function is used for estimation. For the convenience of calculation, this paper uses AMOS 17.0 software to write the operation program and estimate the model. By running the program, it can be obtained that the structural equation model reaches the convergence state after 28 iterations, and the difference between the covariance matrix and the sample covariance matrix is the smallest, as shown in Table 3.

Table 3: Structural Equation Model Results and Hypothesis Testing

Model Path	Normalized path coefficients	Standard error	C.R. (t-value)	Hypothesis supported?
The tacit degree of martial arts knowledge t The degree of internalization of the apprentice	-0.947	0.074	-12.797 ***	support
Organizational mechanisms and cultural characteristics t Degree of internalization of apprentices	0.108	0.045	2.400 **	support
Master's ability to transmit knowledge t Disciple's internalization degree	0.940	0.049	19.183 ***	support
Master's ability to transmit knowledge t Apprentice's degree of externalization	0.222	0.094	2.362 ***	support
The trust relationship between the master and the apprentice t The degree of externalization of the apprentice	0.181	0.094	1.926 **	support
The trust relationship between master and apprentice t Degree of internalization of apprentice	0.917	0.073	12.561 ***	support
The apprentice's ability to receive knowledge t The apprentice's internalization degree	0.816	0.086	9.488 ***	support
The apprentice's ability to receive knowledge t The apprentice's degree of externalization	0.746	0.075	9.945 ***	support
The degree of internalization of the apprentice t The degree of externalization of the apprentice	0.285	0.083	3.434 ***	support

*** means P value less than 0.001, ** means P value less than 0.01

According to the data displayed by the model, the goodness of fit index of the model: $\chi^2=1423.5$, $\chi^2/df=4.67$, CFI=0.935, IFI=0.935, TLI=0.925, GFI=0.900, AGFI=0.877, RMR=0.054, RMSEA=0.060, the fitting of the model is good, and the model correction meets the statistical requirements; at the same time, from the path In terms of coefficients, the absolute value of the diameter coefficient is between 0.108 and 0.947, and does not exceed 0.96, and the standard errors are all positive numbers, indicating that the model parameter test does not violate the estimation phenomenon.

Therefore, the research hypotheses proposed in this study are all established, and the direct and indirect relationships and influences between the variables of the tacit knowledge transfer research of Neijiaquan are as shown in Figure 3.

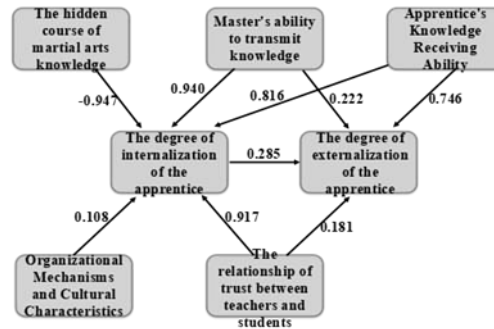


Figure 3: The Relationship and Influence Coefficient of Variables in the Research on the Transfer Effect of Tacit Knowledge of Neijiaquan

According to Figure 3, it can be seen that the tacit degree of martial arts knowledge has a negative impact on the degree of internalization of the apprentice, and its standardized path coefficient is -0.947; correlated at a confidence level of 0.001, the study hypothesis holds. Organizational mechanisms and cultural characteristics have a positive impact on the degree of internalization of apprentices, and the standardized path coefficient is 0.108, which is correlated at a confidence level of 0.01, and the research hypothesis holds.

The master's ability to send knowledge has a positive effect on the degree of internalization and externalization of the apprentice. The path coefficients are 0.940 and 0.222, respectively, which are correlated at the confidence level of 0.001, and the research hypothesis is established. The apprentice's knowledge receiving ability has a positive impact on the apprentice's internalization degree and externalization. The path coefficients are 0.816 and 0.746, respectively, which are related at the confidence level of 0.001, and the research hypothesis is established. The trust relationship between the master and the apprentice has a positive impact on the apprentice's internalization and externalization. The path coefficients are 0.917 and 0.181, respectively, which are correlated at the confidence levels of 0.001 and 0.01, and the research hypothesis holds.

At the same time, according to Figure 3, all the paths and their research hypotheses have been tested. For this reason, the direct effect and indirect effect of the final revision model of Neijiaquan tacit knowledge transfer effect are summarized in Table 4.

Table 4: Summary of Direct and Indirect Effects of the Final Revised Model

model path relationship	direct effect	indirect effect	total effect
The tacit degree of martial arts knowledge t The degree of internalization of the apprentice	-0.947	-	-0.947
Organizational mechanisms and cultural characteristics t Degree of internalization of apprentices	0.108	-	0.108
Master's ability to transmit knowledge t Disciple's internalization degree	0.940	-	0.940
Master's ability to transmit knowledge t Apprentice's degree of externalization	0.222	0.268	0.490
The trust relationship between the master and the apprentice t The degree of externalization of the apprentice	0.181	0.261	0.442
The trust relationship between master and apprentice t Degree of internalization of apprentice	0.917	-	0.917
The apprentice's ability to receive knowledge t The apprentice's internalization degree	0.816	-	0.816
The apprentice's ability to receive knowledge t The apprentice's degree of externalization	0.746	0.233	0.979
The degree of internalization of the apprentice t The degree of externalization of the apprentice	0.285	-	0.285

According to Table 4, from the perspective of the total effect, the most important factors affecting the transfer of Wushu tacit knowledge are that the tacit degree of Wushu knowledge has the greatest impact on the apprentice's internalization degree, with a total effect of -0.947, followed by the master's ability to transmit knowledge, the total effect is 0.940; the biggest factor affecting the degree of knowledge externalization is the apprentice's ability to

receive knowledge, the total effect is 0.979, of which the indirect effect is 0.233, which is through the apprentice's internalization degree as an intermediary variable, the trust relationship between masters and students. The total effect is 0.917.

Overall, the tacit degree of martial arts knowledge has the greatest significant influence on the apprentice's knowledge internalization, followed by the master's knowledge sending ability; at the same time, the apprentice's externalization degree has the greatest comprehensive effect on the apprentice's knowledge receiving ability.

V. DISCUSSIONS

A. *The Master's Ability to Transmit Knowledge Has a Significant Impact on the Degree of Internalization of the Apprentice*

At present, in the process of martial arts knowledge transfer, masters mainly transfer martial arts knowledge through language, pictures and action demonstrations. Due to the large gap between different teachers or masters in their own understanding and understanding of martial arts in the process of explaining and displaying, tacit knowledge transfer. The degree of training is limited, the difficulty of knowledge transfer is increased, and it is difficult for students (apprentices) to comprehend and understand the tacit knowledge and application methods of meridians, breath, strength, breathing and so on contained in Neijiaquan. The main factor affecting the master's ability to transmit knowledge is the initiative to transfer. Under the current organizational mechanism and cultural characteristics, insufficient attention is paid to Wushu practice, resulting in the gradual loss of tacit knowledge of Wushu such as Neijiaquan.

B. *The Apprentice's Ability to Receive Knowledge Has a Significant Impact on the Apprentice's Internalization Level*

The key factor affecting the apprentice's internalization level is the willingness to improve. Under the current mechanism of martial arts knowledge dissemination, apprentices learn martial arts. The purpose of martial arts is less because of interest. Most of them are practicing martial arts as special students or other reasons. The purpose of apprentices to improve the level of martial arts such as Neijiaquan is to win awards in competitions and gain recognition in the martial arts circle. Due to a certain status, he attaches great importance to competitive methods, experience and experience in the training process, and does not pay enough attention to the training mechanism contained in the tacit knowledge of martial arts. He has a strong desire to improve, but lacks motivation in learning and disseminating tacit knowledge.

C. *The Organizational Mechanism and Cultural Characteristics Have the Least Influence on the Degree of Internalization of the Apprentice*

Whether in colleges and universities or in the private sector, the mentoring model is still an important model for the transfer of Chinese martial arts knowledge. The rituals and inner relationships of the style have undergone fundamental changes. The current master-apprentice model is more simplified as an identity relationship or interpersonal relationship, which has little impact on the internalization of apprentice knowledge, but the organizational mechanism and cultural characteristics still have a significant impact on the transfer of tacit knowledge of martial arts, which cannot be directly eliminated.

D. *The Master's Ability to Transmit Knowledge Has a Significant Impact on the Degree of Externalization of the Apprentice*

The ability to transfer knowledge that has been internalized to others is an important measure of the degree of externalization. In the master-apprentice mode, the stronger the master's ability to transmit knowledge and the higher the degree of internalization and externalization of the apprentice, the apprentice can easily form written materials for the study and training of Neijia Quan, and the readability of the written words or materials summarized will be reduced. The stronger you are, the easier it will be for you to transfer tacit knowledge to the practitioners during the training and practice process with "shidi" or "shimei", and the transfer ability of the apprentices will continue to increase, thereby improving the effectiveness of knowledge transfer within the team.

E. *The Degree of Internalization of Apprentices and the Ability to Receive Knowledge Have a Significant Impact on the Degree of Externalization*

The stronger the apprentice's ability to receive knowledge, the easier it is for the apprentice to internalize the knowledge sent by the master, and the more able to comprehend, master the practice techniques, training methods and the use of Qi Jin of Neijia Quan, so as to facilitate summarization and form corresponding training. These

materials will help the apprentices to show the internalized knowledge to other practitioners in the team in pictures, body and other ways, thus speeding up the transfer of knowledge.

F. The Trust Relationship Between the Master and the Apprentice Has a Significant Impact on the Apprentice's Degree of Externalization

Although the current master-apprentice model is different from the traditional master-apprentice relationship, the trust relationship between the master and the apprentice in the process of training and practice has a significant impact on the degree of externalization of the apprentice. Under the existing teaching model, the higher the degree of trust between the master and the apprentice, the closer the relationship between the master and the apprentice, the higher the frequency that the master leads the apprentice to participate in external and daily exchanges, and the greater the opportunity for the apprentice to acquire tacit knowledge. Apprentices can also more deeply comprehend and internalize the tacit knowledge of Neijiaquan in daily communication and external communication.

VI. CONCLUSIONS

A. From the Perspective of the Standardized Path Coefficient, the Factors Affecting the Internalization of Apprentices' Knowledge Are

Firstly the implicit degree of knowledge in martial arts (the path coefficient is 0.947, the same below); secondly the master's ability to transmit knowledge (0.940), the trust relationship between the master and the apprentice (0.917) and the apprentice's ability to receive knowledge (0.816); lastly and least the organizational mechanism and cultural characteristics (0.108). Meanwhile, the factors that affect the externalization of the apprentices' knowledge include the apprentice's ability to receive knowledge (0.746), the degree of internalization of the apprentice's knowledge (0.285), the master's ability to transmit knowledge (0.222), and trust relationship between the master and the apprentice (0.181).

B. In the Process of Transferring Tacit Knowledge of Chinese Martial Arts, the Internalization of Apprentices' Knowledge is Mainly Affected by the Following Five Factors

Tacit degree of martial arts knowledge, organizational mechanism and cultural characteristics, master's ability to transmit knowledge, trust relationship between the master and the apprentice, and the apprentice's ability to receive knowledge. In the meantime, master's ability to transmit knowledge, trust relationship between the master and the apprentice, the apprentice's ability to receive knowledge, and the degree of internalization of the apprentice's knowledge all affect the externalization of the apprentices' knowledge. In the actual practice, Chinese martial arts, which pays equal attention to both internal and external training, is different from western competitive sports. The transfer and dissemination of tacit knowledge of martial arts is of great significance for the inheritance of the connotation and quintessence of the arts. If the tacit knowledge is gradually lost, the connotations of martial arts would change fundamentally, which is, as a precaution, a great loss to Chinese culture and its civilization.

REFERENCES

- [1] LI-HONG H E. Knowledge Production: Deconstruction of Modern Wushu Development Dynamics. Journal of Beijing Sport University, 2016[2024-01-19]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-BJTD201604008.htm.
- [2] JIANG-HUA Z. The Starting Point of Destination: Knowledge Orientation on the Development of Martial Arts. China Sport Science, 2012[2024-01-19]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-TYKX201205006.htm.
- [3] XIN-MENG C, GUANG-SHENG Z. Presence of Body and Absence of Language—Research on Tacit Knowledge of Wushu. China Sport Science, 2016[2024-01-19]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-TYKX201602003.htm.
- [4] ZIHAN-XIN L I, GUI-LONG Z. The impact of partners difference on knowledge transfer in university-institute-industry collaboration. Studies in Science of Science, 2019[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-KXYJ201902018.htm.
- [5] KOTABE M, MARTIN X, DOMOTO H. Gaining from vertical partnerships: knowledge transfer, relationship duration, and supplier performance improvement in the U.S. and Japanese automotive industries. Strategic Management Journal, 2003, 24(4): 293-316. DOI:10.1002/smj.297.
- [6] LIANZHONG C, NA Z, QUANZHONG Z. Tacit Knowledge Transfer Mechanism of Athletic Talents Based on the Apprenticeship Model. Journal of Shenyang Sport University, 2013[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-SYTB201306006.htm.
- [7] XU-LIANG D, RUI-GANG Y. The Impact of Neijia Kongfu's Social Capital on the Transfer of Tacit Knowledge Within Organization. Journal of Lvliang University, 2014[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-LLXK201405025.htm.

- [8] LIPING S, JINGTING Y, SHULIN T. An Approach to Dynamic Evaluation of Patent Cooperation Ability of Cluster Core Enterprise with Culture Embeddness Perturbation. *New Technology of Library and Information Service*, 2014[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-XDTQ201403017.htm.
- [9] WEI S, JIA-NING Z, XIAN-RUI S, et al. Research of Tacit Knowledge Transfer Process in Enterprise Mentoring System Based on Hierarchical Model[J/OL]. *Journal of Anhui Electrical Engineering Professional Technique College*, 2018[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-ADZD201802008.htm.
- [10] YUAN-YUAN D, BIN-BIN L U, YAN-YAN L. An Empirical Study on the Effect of Knowledge Transfer of the Supply Chain Core Enterprise on the Supply Chain Performance. *East China Economic Management*, 2018[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-HDJJ201810022.htm.
- [11] MI Z, WEN-HONG Z, HONG-YUAN S, et al. Empirical research of the relationship between knowledge distance and knowledge transfer based on knowledge characteristics. *Studies in ence of ence*[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-KXYJ201507013.htm.
- [12] MAN Q, XING W, HU-KE S I. An empirical research on the effect of knowledge properties on the knowledge transfer performance of physical education teachers in colleges and universities. *Journal of Shandong Sport University*, 2015[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-TIRE201505019.htm.
- [13] WEI L. Research on the Evaluation Mechanism of the Fit Degree of Tacit Knowledge Transfer in Enterprise Mentoring System. *Information Studies:Theory & Application*, 2017[2024-01-20]. http://en.cnki.com.cn/Article_en/CJFDTOTAL-QBLL201702020.htm.
- [14] DE LUCA P, CANO RUBIO M. The curve of knowledge transfer: a theoretical model. *Business Process Management Journal*, 2018, 25(1): 10-26. DOI:10.1108/BPMJ-06-2017-0161.
- [15] VICKERS Z M, CHRISTENSEN C M, FAHRENHOLTZ S K, et al. EFFECT OF QUESTIONNAIRE DESIGN AND THE NUMBER OF SAMPLES TASTED ON HEDONIC RATINGS1. *Journal of sensory studies*, 1993[2024-01-20]. https://www.nstl.gov.cn/paper_detail.html?id=78ee2a0c83f51cf601fd545677c56bf3.