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Research on the Evaluation Model of Chinese Culture Overseas Communication Effect and Reception Based on Quantitative Calculation Analysis

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Abstract With the accelerating process of globalization, the overseas dissemination of Chinese culture has ushered in new opportunities and challenges. This paper takes TCM acupuncture in Chinese culture as an example to evaluate and analyze the effect and acceptance of overseas communication of Chinese culture. The entropy weight-TOPSIS method is used to obtain the weights of the indicators of Chinese culture dissemination effect, and quantitative evaluation analysis is carried out. With the help of Qualitative Comparative Analysis (QCA) method, the consistency and coverage monitoring analysis of Chinese culture's overseas communication effect continues. The results of the ranking of the evaluation indicators of the effect of Chinese culture dissemination overseas based on the weights are: cognitive indicators (54.03%) > behavioral indicators (31.1%) > attitudinal indicators (14.87%). And in the similarity analysis, the communication effect score of the nine content modules of Chinese medicine and acupuncture averaged 0.11, the overall overseas communication effect is not satisfactory, and it is still necessary to further improve the overseas communication effect of Chinese culture.

Index Terms entropy weight, TOPSIS method, qualitative comparative analysis, Chinese culture, overseas communication

I. Introduction

Chinese culture is one of the oldest and deepest cultures in the world [1]. In the long history of Chinese culture, adhering to the traditional values of “benevolence, righteousness, propriety, wisdom and trust”, it has made unique contributions in many fields such as philosophy, literature, art and science [2], [3]. Chinese culture has a profound heritage and a long history, and along with China's economic rise and international status, more and more people are beginning to understand and love traditional Chinese culture [4]-[6]. But how to make Chinese culture better spread and recognized in the international community is a consideration that cannot be ignored [7].

There are three main forms of Chinese culture dissemination overseas: First, government and private organizations hold exhibitions, exchanges, performances and other activities [8]. The second is the combination of traditional culture with modern technology, such as the combination of Chinese characters and animation, and the combination of traditional musical instruments and electronic music [9], [10]. The third is the development of China's cultural industry, such as cultural creative products, movies, TV dramas, animation games, etc [11], [12]. With the development and popularization of network technology, more and more people learn about Chinese culture through the Internet [13], [14]. Chinese traditional culture websites, WeChat, TikTok and other social platforms have become the preferred way for foreign young people to learn about Chinese culture [15]. These platforms are feature-rich and content-rich, providing overseas audiences with channels to directly understand and engage with Chinese culture [16]-[18]. In recent years, the cause of spreading Chinese culture to foreign countries has made great development and progress, and a large number of cultural products with the characteristics of the times and Chinese characteristics have emerged, such as Confucius Institutes and Confucius Classrooms that have blossomed in countries all over the world, “Chinese Culture Year” and “China Festival”, etc., all of which have attracted great attention all over the world. “All of them highlight the achievements made by the spread of Chinese culture to foreign countries [19]-[22].

Based on the entropy weight-TOPSIS method and the qualitative comparative analysis method, this paper selects the overseas communication effect of TCM acupuncture and moxibustion as the case and object of this study, and carries out the research and analysis of the overseas communication effect and acceptance of Chinese culture. The entropy weight method was used to determine the index weight of the overseas communication effect of Chinese culture, and then the TOPSIS method was used to quantitatively evaluate and analyze the overseas communication effect of Chinese culture, and the Euclidean distance between the objects and the positive and negative ideal

solutions was comprehensively evaluated, and the similarity proximity was calculated, and the overseas dissemination effect of different TCM acupuncture content modules was ranked according to the proximity to study the overall overseas dissemination effect and acceptance of TCM acupuncture. Qualitative comparative analysis was utilized to design and assign values to the variables of Chinese culture dissemination overseas. Cultural factors (CF), efficacy factors (CEF), participant factors (PF), industry factors (IF), environmental factors (EF), and media factors (MF) were set as conditional variables, and the overseas spread of acupuncture (TAS) was set as the outcome variable, and a truth table was constructed and the consistency and coverage of the study cases were examined using the fs/QCA3.0 software to determine whether there was a relationship of necessity and adequacy between the variables. The relationship between necessity and sufficiency was determined. Finally, based on the results of the study and analysis, communication strategies are proposed to enhance the effectiveness of Chinese culture communication overseas.

II. Research Design

In the current context of Chinese culture going out, the effect and reception of Chinese culture spreading abroad is an important dimension to measure the quality of Chinese culture going out. Research on the effects and receptivity of Chinese culture's overseas dissemination can help expand the research agenda and paradigm of Chinese culture's foreign dissemination.

II. A. Objects of study

In this paper, we will take the communication effect of Chinese traditional medicine and acupuncture overseas as a case study to explore the effect and reception of Chinese culture overseas.

II. B. Data sources

In this paper, we analyze the influencing factors of the spread of Chinese medicine and acupuncture overseas, so as to provide a reference for the framework of the influencing factors of the spread of Chinese medicine and acupuncture overseas, and prepare the Questionnaire on the Effectiveness of Overseas Spread of Chinese Culture. The questionnaire was distributed through three main channels: firstly, to overseas friends or colleagues in life and work, and ask them to forward the questionnaire to their overseas colleagues, relatives and friends; secondly, through overseas alumni associations, contacting alumni who have settled or immigrated overseas, and ask them to forward the questionnaire to their overseas colleagues, relatives and friends; thirdly, through overseas Chinese medicine associations, overseas acupuncture (Chinese medicine) practitioners' exchanges and so on to fill in the questionnaire. Thirdly, to fill in the questionnaire through overseas Chinese medicine associations, overseas acupuncture (Chinese medicine) practitioners' exchanges, etc. The first two channels ensure that the survey respondents are as diversified as possible in terms of cultural background and social level, so as to obtain objective data on the development of acupuncture and moxibustion overseas, while the third channel favors acupuncture and moxibustion practitioners with cross-cultural experiences in the U.S. and China, which ensures the professionalism of the data.

The questionnaire survey lasted for about 30 days, and 625 responses were collected, of which 112 were submitted through the link of the Chinese and English versions of the questionnaire, and 513 were submitted through the link of the English version of the questionnaire.

II. C. Research methodology

The research method used in this paper is entropy weight-TOPSIS method with qualitative comparative analysis.

II. C. 1) Entropy weight-TOPSIS method

1) Overview of entropy weight method

Entropy weight method, physics term, according to the interpretation of the basic principles of information theory, information is a measure of the degree of order of the system, entropy is a measure of the degree of disorder of the system; according to the definition of the information entropy, for a certain indicator, you can use the entropy value to determine the degree of dispersion of a certain indicator, and the smaller the entropy value of the information, the greater the degree of dispersion of the indicator, and the greater the impact of the indicator on the comprehensive evaluation (i.e., the weights), and if the value of a certain indicator values are all equal, the indicator does not play a role in the comprehensive evaluation [23]. Therefore, the information entropy can be used as a tool to calculate the weight of each indicator to provide a basis for the comprehensive evaluation of multiple indicators. The entropy weight method refers to the weight of indicators obtained by mathematical operation processing of raw data, which has objectivity. At present, there are two main methods for confirming the weight of indicators: subjective and objective weighting. Subjective weighting is based on subjective experience and judgment, and certain methods

are used to determine the weight of attribute indicators, such as fuzzy comprehensive evaluation method, relative comparison method, hierarchical analysis method, and chain ratio method, all of which have strong subjective consciousness, and the personal judgment will have an uncertain effect on the results of the evaluation. Objective assignment method is based on the decision matrix to provide objective information of evaluation indexes, using data calculation method to confirm the weight of attribute indexes, free from the interference of subjective emotional color, and has a stronger objectivity on the results of evaluation. Therefore, this paper uses the entropy weight method to determine the weights of the marketing communication effect evaluation indicators of the military-to-civilian enterprises.

2) Overview of TOPSIS method

TOPSIS method is a ranking method based on the proximity of a finite number of evaluation objects to the idealized target, and it is the evaluation of relative advantages and disadvantages among the existing objects [24].TOPSIS method is a ranking method that approximates the ideal solution, and the method only requires that each utility function has monotonically increasing (or decreasing) sex.TOPSIS method is a common and effective method in multi-objective decision analysis, also known as the distance to the solution method. It is also known as the distance between superior and inferior solutions method. The basic principle is to rank the evaluation objects by detecting their distance from the optimal solution and the worst solution; if the evaluation object is closest to the optimal solution and furthest away from the worst solution at the same time, then it is the best; otherwise, it is not optimal. In the optimal solution, each index value reaches the optimal value of each evaluation index. The index value of the worst solution reaches the worst value of each evaluation index.

3) Entropy weight-TOPSIS method implementation steps

In this paper, the entropy weight method is firstly used to determine the calculation of the weights of the indicators of the effect of overseas communication of Chinese culture, and secondly, the TOPSIS method is used to carry out quantitative evaluation and analysis of the effect of overseas communication of Chinese culture. The specific implementation steps for the evaluation and analysis of the effect of overseas Chinese culture dissemination based on entropy weight-TOPSIS analysis are as follows [25]:

(1) Collect raw data to establish the index matrix

There are n evaluation objects and m indicators, and the original data matrix of $n*m$ is obtained.

(2) Indicator standardization

Apply the extreme value method to standardize the raw data, eliminate the influence of the indicator unit of measurement, and establish the standardization matrix. Where y_{ij} is the i th brand, the j th indicator after standardization, x_{ij} is the original data, $\max\left(x_{ij}\right)$ and $\min\left(x_{ij}\right)$ are the maximum and minimum values of the j th indicator in the original matrix:

$$\text{Positive indicators: } y_{ij} = \frac{x_{ij} - \min(x_{ij})}{\max(x_{ij}) - \min(x_{ij})} + 0.0001 \tag{1}$$

$$\text{Negative indicators: } y_{ij} = \frac{\max(x_{ij}) - x_{ij}}{\max(x_{ij}) - \min(x_{ij})} + 0.0001 \tag{2}$$

(3) Calculate the proportion of indicator y_{ij} p_{ij}

That is, to calculate the proportion of the standardized value of the j th indicator of the i th TCM acupuncture content module in the sum of the standardized values of the j th indicator of all evaluated objects:

$$p_{ij} = \frac{y_{ij}}{\sum_{j=1}^{n} y_{ij}} \tag{3}$$

(4) Define entropy

Calculate the entropy of the j th indicator, where $0 \le e_j \le 1$:

$$e_j = -\frac{1}{\ln n} \sum_{i=1}^{n} p_{ij} \ln(p_{ij}) \tag{4}$$

(5) Calculate the coefficient of variation $g_j = 1 - e_j$ for the j th indicator, the larger the value the more important the indicator is in the comprehensive evaluation:

$$g_j = 1 - e_j \tag{5}$$

(6) Calculation of indicator weights:

$$w_j = \frac{g_j}{\sum_{j=1}^{m} g_j} \tag{6}$$

(7) Scoring each TCM acupuncture content module, multiplying the normalized matrix indicators by the indicator weights, and summing the indicators and summing them to produce a weighted score.

(8) Construct the weighting matrix

Where $j = 1, 2 \cdots m$, W_j is the weight:

$$Z = (z_{ij})_{n*m} \tag{7}$$

(9) Determination of positive and negative ideal solutions

According to the weighting matrix Z, the positive ideal solution (optimal direction solution) and negative ideal solution (worst direction solution) are obtained, where $i = 1, 2 \cdots n$; $j = 1, 2 \cdots m$. Z_{ij}^{+} and Z_{ij}^{-} denote the maximum and minimum values of the evaluation object in the j th index, respectively:

$$\text{Positive Ideal Solution: } Z^{+} = \left(Z_{i1}^{+}, Z_{i2}^{+}, \cdots, Z_{in}^{+}\right) \tag{8}$$

$$\text{Negative Ideal Solution: } Z^{-} = \left(Z_{i1}^{-}, Z_{i2}^{-}, \cdots, Z_{in}^{-}\right) \tag{9}$$

(10) Calculate the Euclidean distances D_i^{+} and D_i^{-} between the indicator values of each evaluation object and the positive and negative ideal solutions, where W_j denotes the weight coefficient of j:

$$D_i^{+} = \sqrt{\sum_{j=1}^{m} w_j (z_{ij}^{+} - z_{ij})^2} \tag{10}$$

$$D_i^{-} = \sqrt{\sum_{j=1}^{m} w_j (z_{ij}^{-} - z_{ij})^2} \tag{11}$$

(11) Calculate the relative proximity of the indicator values of each evaluation object to the positive and negative ideal solutions:

$$C_i = \frac{D_i^{-}}{D_i^{+} + D_i^{-}} \tag{12}$$

(12) According to the size of the value of C_i, the evaluation objects are ranked in order of their advantages and disadvantages, and the value of C_i is in the range of $[0,1]$. The closer the value of C_i is to 1, the closer the evaluation object is to the positive ideal solution, and the closer the value of C_i is to 0, the further the evaluation object is away from the positive ideal solution.

4) The construction of the evaluation system for the effect of Chinese culture dissemination abroad

Based on the principles of simplifying the evaluation system, separating the main and secondary points, and the availability of data, and analyzing in depth the actual characteristics of Chinese culture dissemination, the dissemination process, and the dissemination channels, we initially constructed the evaluation system of this study, and provided five evaluation criteria after the indicators at all levels, assigning five, four, three, two, and one points, respectively. The evaluation system of Chinese culture dissemination effect overseas is shown in Table 1.

Table 1: Evaluation system of the effect of overseas dissemination of Chinese culture

First-level dimension	Secondary dimension
Cognitive effect	Knowledge cognition(A1)
	Experience cognition(A2)
	Functional cognition(A3)
	Propagating cognition(A4)
	Cultural cognition(A5)
Attitude effect	Emotional bias(B1)
	Value judgment(B2)
	Intention tendency(B3)
Behavior effect	Consumer behavior(C1)
	Sharing behavior(C2)
	Instantaneous behavior(C3)

II. C. 2) Qualitative comparative analysis

Qualitative Comparative Analysis (QCA) is based on the principle of Boolean algebra, and through discussing the affiliation between sets and discovering the universal characteristics of multiple cases, it tries to explain the key factors contributing to the generation of an event, the interconnection between the factors, and the complex combinations of causes stimulating the generation of the event, with a view to deepening the understanding of the complex causality of the generation of the event. Simply put, through the comparison between a certain number of cases, we can find the universal affiliation between sets, and infer the causal relationship with the help of the set relationship.

Qualitative comparative analysis is divided into clear set qualitative comparative analysis (csQCA) and fuzzy set qualitative comparative analysis (fsQCA), as well as multi-valued set qualitative comparative analysis (mvQCA) developed from clear set qualitative comparative analysis [26]. In order to avoid the over-simplified dichotomy principle in CsQCA, which leads to ignoring the differences between cases and the loss of sample data in the attribution process, this paper uses the “partial affiliation” division and chooses the FsQCA analysis technique.

In this paper, cultural factors (CF), efficacy factors (CEF), participant factors (PF), industry factors (IF), environmental factors (EF), and media factors (MF) will be selected as the antecedent variables, and the spread of acupuncture abroad (TAS) as the outcome variable, and FsQCA will be applied to conduct a cohort analysis to further analyze whether there are certain combinations of antecedent variables that have some combinations of effects on the spread of Chinese medicine acupuncture in the United States. The FsQCA was used to further analyze whether there were certain combinations of the antecedent variables that had a combined effect on the spread of TCM and acupuncture in the United States and to what extent.

Based on the steps of the qualitative comparative analysis, a truth table was constructed as the basis for the qualitative comparative analysis, and the study took the values based on the principle of dichotomous attribution in accordance with the set condition variables and outcome variables and the coding instructions. After constructing the truth table, the fs/QCA 3.0 software was used to examine the consistency and coverage of the study cases to determine whether there is a relationship of necessity and sufficiency between the variables. Consistency refers to the extent to which a given variable (or combination of conditions) can explain all cases, and it is generally recognized that conditional factors with a consistency of more than 0.9 are necessary for the occurrence of results, and conditional factors with a consistency of more than 0.8 are sufficient for the occurrence of results. Coverage rate is the main indicator reflecting the extent to which the combination of condition variables explains the emergence of the results, i.e., the condition variables and the combination of the results of the variables explain the strength of the embodiment, it is generally believed that the higher the value of the coverage rate, the stronger the strength of its explanation. The formulae for consistency and coverage are as follows:

$$Consistency\left(x\_i \le y\_i\right) = \sum \min\left(xi, yi\right) / \sum xi \tag{13}$$

$$Coverage\left(x\_i \le y\_i\right) = \sum \min\left(xi, yi\right) / \sum yi \tag{14}$$

III. Analysis of Overseas Communication Effect of Chinese Acupuncture and Moxibustion Based on Entropy Weight-TOPSIS Method

In this chapter, the entropy weight-TOPSIS method will be used to analyze the effect and acceptance of Chinese medicine and acupuncture in overseas communication by combining with the evaluation system of the effect of overseas communication of Chinese culture constructed in this paper.

III. A. Entropy weight analysis

First, the data for the 11 evaluation level 2 indicators were standardized so that they could be compared on the same scale in order to eliminate errors arising from the unit of measurement of the indicators. Second, indicator weights were determined. In view of the difference in the amount of information of the 11 indicators, to ensure that the weights are reasonably distributed, this study adopts the entropy weight method to determine the weights of each evaluation indicator of the overseas dissemination effect of the English translation of Chinese medicine and acupuncture. Considering that the information entropy is inversely proportional to the amount of information and entropy weight, in order to visualize the characteristics of the data, a new variable “information utility value” is introduced. The smaller the information entropy is, the larger the information utility value is, i.e., the more information is provided, the larger the entropy weight is. Using the above method, the weights of the 11 secondary indicators are shown in Table 2. As can be seen from the table, the weight of cognitive indicators accounts for 54.03%, occupying a dominant position, and the relevant indicators play the most important role in evaluating its communication effect. Behavioral indicators reveal the influence of audience's actual behavioral responses on the evaluation of communication effects, with a weight share of 31.1%, while attitudinal indicators have a relatively low weight share of 14.87%.

Table 2: Propagation effect (TOPSIS score) statistics

First-level dimension	Entropy Weight (%)	Secondary dimension	Effective value of information	Information entropy	Entropy Weight (%)
Cognitive effect	54.03	Knowledge cognition(A1)	0.3164	0.6836	19.57
		Experience cognition(A2)	0.6308	0.3692	10.55
		Functional cognition(A3)	0.9264	0.0736	2.11
		Propagating cognition(A4)	0.6428	0.3572	10.19
		Cultural cognition(A5)	0.5933	0.4067	11.61
Attitude effect	14.87	Emotional bias(B1)	0.4843	0.5157	14.77
		Value judgment(B2)	0.9985	0.0015	0.03
		Intention tendency(B3)	0.9973	0.0027	0.07
Behavior effect	31.1	Consumer behavior(C1)	0.4455	0.5545	15.87
		Sharing behavior(C2)	0.5213	0.4787	13.65
		Instantaneous behavior(C3)	0.9456	0.0544	1.58

III. B. Proximity analysis

In order to better understand the dissemination effect of Chinese medicine and acupuncture overseas, this chapter is based on the principles of Chinese medicine and acupuncture, and divides Chinese medicine and acupuncture into 9 content modules, which are meridian theory, acupoints, stabbing techniques, moxibustion, acupuncture and moxibustion therapeutics, dialectical treatment, special acupuncture, acupuncture and five elements doctrine, acupuncture and moxibustion contraindications and precautions in Chinese medicine and moxibustion, and are in the order of "1~9 " serial number substitution. The normalized data were multiplied with the weights of each indicator to calculate the similarity closeness of the overseas dissemination effect of each content module of Chinese medicine and acupuncture, respectively. The similarity of the dissemination effect was measured by calculating the Euclidean distance between the evaluation object and the positive and negative ideal solutions, and the value of similarity closeness was obtained, ranging from 0 to 1, with a higher value indicating a better dissemination effect. The final TOPSIS scores are shown in Table 3. According to the dissemination effect scoring score, the average dissemination effect score of the nine content modules of TCM and acupuncture is 0.11, which shows that the overall dissemination effect of TCM and acupuncture in overseas is not satisfactory.

Table 3: Statistics of the communication effect of each content module

Content	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	Score
1	1	1	17	15603	261	664	4	5	0	126	45375	0.2701
2	0	1	28	4091	2594	135	4	5	12	12	111348	0.1923
3	0	1	87	6492	2298	38	4	5	5	6	1539177	0.1443
4	0	1	190	6492	1735	46	4	5	4	12	498070	0.1306
5	1	0	115	0	0	4	4	5	0	0	2874487	0.1289
6	0	0	24	1796	63	19	4	5	0	9	1799265	0.0435
7	0	0	70	0	34	29	4	4	0	8	1616181	0.0346
8	0	0	40	0	14	4	4	4	0	4	12732163	0.0296
9	0	0	113	128	33	5	4	5	0	2	1970799	0.0262

III. C. Trend analysis of communication acceptance

In order to understand the process of overseas dissemination of TCM acupuncture, this paper further analyzes the collected data from a temporal perspective. The overseas dissemination of TCM acupuncture in different time periods is specifically shown in Figure 1. The first stage is from 2005-2010, the effect of overseas dissemination of TCM acupuncture shows an obvious decreasing trend from 0.2701 to 0.0346.The second stage is from 2010-2015, the overseas dissemination of TCM acupuncture the overseas dissemination of TCM acupuncture shows an obvious fluctuating situation. The third stage is in 2015-2020, the overseas communication activities of Chinese medicine and acupuncture relatively fell into silence, and the overseas communication of Chinese medicine and acupuncture

failed to attract greater attention and waves. The final stage is from 2020-2025, when the overseas communication effect of TCM acupuncture experienced a rebound and rebound, and the overseas communication effect score increased to 0.1289.

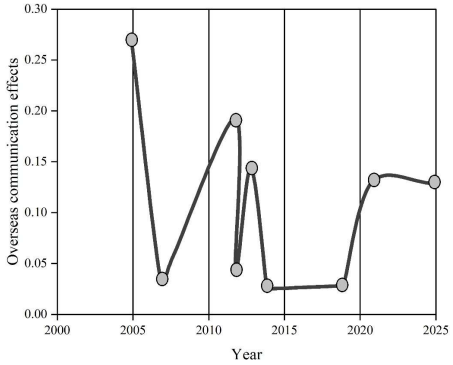

Figure 1: Communication effect

IV. Analysis of the Effect of Overseas Communication of Chinese Medicine and Acupuncture Based on QCA

In this chapter, we will apply the Fuzzy Set Qualitative Comparative Analysis (FsQCA) of the Stereotyped Comparative Analysis to further analyze the influencing factors as a group, so as to reveal more clearly the effects of the combined relationships among the influencing factors on the dissemination of TCM and acupuncture overseas.

IV. A. Data processing

Data calibration is a key step in the FsQCA analysis, aiming at converting the data into a fuzzy affiliation degree, with values ranging from 0 to 1, representing whether and to what extent a case belongs to the fuzzy set formed by the variable. When the value is close to or equal to 1, it is considered that the case (sample) belongs to this set completely; when the value is close to or equal to 0, it is considered that the case (sample) does not belong to this set at all. When the value is 0.5, it is considered that the case (sample) belongs to both fuzzy set and non-fuzzy set, which is also called fuzzy affiliation.

The preliminary processed data were imported into FsQCA 3.0 software, and the calibrate function of FsQCA 3.0 software was utilized to complete the calibration of each variable by inputting complete affiliation point, fuzzy affiliation point and complete non-affiliation point respectively. The value of 0.5 after calibration was manually adjusted to 0.501 to ensure the validity of all data as well as the integrity of the results of the configuration analysis, as shown in Table 4.

Table 4: Data calibration results (part)

Case	CF	IF	EF	PF	CEF	MF	TAS
1	0.73	0.11	0.18	0.76	0.35	0.51	0.21
2	0.51	0.29	0.37	0.35	0.29	0.27	0.27
3	0.73	0.3	0.18	0.23	0.29	0.28	0.21
4	0.73	0.4	0.69	0.76	0.78	0.73	0.41
5	0.95	0.83	0.37	0.49	0.65	0.38	0.33
6	0.22	0.29	0.501	0.95	0.92	0.88	0.42
7	0.03	0.21	0.42	0.06	0.05	0.05	0.03
8	0.15	0.05	0.17	0.18	0.08	0.12	0.07
9	0.1	0.29	0.37	0.14	0.08	0.12	0.06
.....	.....	.....	.....	.....	.....	.....	.....
585	0.15	0.29	0.05	0.18	0.11	0.12	0.05

IV. B. Necessity analysis

Before conducting FsQCA analysis on the calibrated data, it is also necessary to conduct necessity analysis on each of the antecedent variables as a way to understand whether there exists a certain antecedent variable that is always present or always absent in influencing the process of spreading TCM and acupuncture culture overseas.

In the necessity analysis, consistency and coverage are used as key indicators. Consistency represents the extent to which the antecedent variable (independent variable) is a necessary condition for a particular outcome (dependent variable), reflecting the likelihood of the independent variable as a necessary condition; coverage refers to the proportion of sample cases covering the necessary condition variable, reflecting the explanatory power of the variable. The antecedent variable is judged to be necessary when the threshold of consistency reaches 0.9 or more. Through the NecessaryConditions analysis function in FsQCA 3.0 software, the calibrated data were analyzed for necessity, and the specific results are shown in Table 5. From the results, it can be seen that the consistency values of the presence and absence of the six antecedent variables are below 0.9, indicating that cultural factors (CF), efficacy factors (CEF), participant factors (PF), industry factors (IF), environmental factors (EF), and media factors (MF) are not the necessary conditions affecting the dissemination of TCM and acupuncture culture overseas, and they cannot explain the formation of the results individually. Therefore, this chapter will further analyze the role of the combination of conditions on the overseas diffusion of TCM and acupuncture culture.

Table 5: Necessity analysis results

Conditions	Consistency	Coverage
CF	0.717767	0.727032
~CF	0.549595	0.575091
IF	0.717378	0.742412
~IF	0.563146	0.576614
EF	0.773805	0.726686
~EF	0.49507	0.563808
PF	0.774725	0.758857
~PF	0.500202	0.542512
CEF	0.773287	0.758882
~CEF	0.50895	0.550847
MF	0.689455	0.760334
~MF	0.598664	0.577781
Note : Adding a ' ~ ' symbol before the variable name indicates that it does not belong to the variable, that is, the variable does not exist.		

IV. C. Configuration Analysis

IV. C. 1) Constructing the truth table

The truth table is constructed to classify and categorize the sample cases into different combinations of conditions (groupings) before the grouping analysis. In this study, the consistency threshold was set to 0.8 and the case frequency threshold was set to 6. Meanwhile, based on the preliminary truth table constructed by the FsQCA 3.0 software, the author manually assigned the result code of PRI consistency value above 0.75 as 1, and the result code of result below 0.75 as 0, and obtained the final truth table as shown in Table 6.

Table 6: Truth value table (part)

The configuration condition	TAS					
	M1	M2	M3	M4	M5	M6
CF (Culture)	●					●
IF (Industry)	●	●	●	●		●
EF (Environment)	-	●	●		●	●
MF (Media)	●		●	●	●	●
PF (participant)	●	●		●	●	●
CEF (curative effect)	●	●	●	●	●	
Original coverage rate	0.489	0.502	0.464	0.476	0.496	0.416
Net Coverage	0.014	0.016	0.022	0.034	0.027	0.012
Consistency	0.904	0.912	0.914	0.905	0.905	0.929
Combined coverage rate	0.64					
Combinatorial consistency	0.858					
Note:● Representing the existence of core conditions ;• Representing the existence of edge conditions ;⊗ represents the core condition does not exist (negative) ;⊗ represents that the marginal condition does not exist (negative) ; 'Blank ' represents that the condition can exist or not exist.						

IV. C. 2) Conditional Configuration Analysis

The FsQCA3.0 software analyzes and generates three types of solutions: parsimonious, intermediate and complex. Among them, the parsimonious solution is the solution generated by completely incorporating the logical remainder operation, the intermediate solution is the solution generated by incorporating the important logical remainder operation, and the complex solution is the solution generated by not incorporating the logical remainder operation at all (the logical remainder indicates that there is no grouping corresponding to the instances), and it is generally considered that the intermediate solution is the optimal solution. The intermediate solution obtained in this study has six group states, which are CF*IF*PF*CEF, IF*EF*PF*CEF, IF*EF*MF*CEF, IF*PF*CEF*MF, EF*PF*CEF*MF, CF*IF*EF*PF*MF. The results of the group state analysis are specifically shown in Table 7. As can be seen from the results of the histogram analysis, the consistency of individual histograms is 0.904, 0.912, 0.914, 0.905, 0.905, 0.929, respectively, and the overall consistency of the six histograms is 0.858, which indicates that the current antecedent variables have already constituted a sufficient condition for the resultant variables, the histogram effect exists, and the results of the histogram analysis are relatively full, and the following conclusions can be drawn:

(1) The acupuncture industry factor appears more frequently as a core condition, and the acupuncture industry has gradually developed and expanded during the global spread of TCM acupuncture. Acupuncture and moxibustion have been continuously “localized”, maximally adapted to the survival of the soil around the world, and formed an industry that generates huge economic benefits, thus playing a more obvious role in the spread of acupuncture and moxibustion culture. 5 out of 6 groupings contain acupuncture and moxibustion industry factors, and 4 of them are present as core conditions.

(2) Cultural factors did not appear as core conditions in the groupings, and there were only two groupings as marginal conditions. This indicates the weakest influence of acupuncture cultural factors in the spread of TCM acupuncture overseas.

(3) Both the participant factor and the efficacy factor had five groupings, of which three appeared as core conditions and two as borderline conditions. This illustrates the significant and stable influence of participant factors and efficacy factors as intrinsic factors affecting the diffusion of TCM acupuncture. Acupuncturists and consumers are the main actors in realizing TCM acupuncture treatment, and the significant efficacy produced is the fundamental guarantee for sustained influence.

(4) Both environmental factors and media factors as external factors with moderating effects had four groupings, of which three appeared as core conditions and one appeared as a marginal condition. Environmental factors and media factors are influenced by internal factors and have an impact on the dissemination of Chinese medicine and acupuncture, and the impact can be positive or negative, so in the strategy research, we should consider how to control the impact of these two factors to make them show a positive impact.

Table 7: Results of configuration analysis

The configuration condition	TAS					
	M1	M2	M3	M4	M5	M6
CF (Culture)	●					●
IF (Industry)	●	●	●	●		●
EF (Environment)	-	●	●		●	●
MF (Media)	●		●	●	●	●
PF (participant)	●	●		●	●	●
CEF (curative effect)	●	●	●	●	●	
Original coverage rate	0.489	0.502	0.464	0.476	0.496	0.416
Net Coverage	0.014	0.016	0.022	0.034	0.027	0.012
Consistency	0.904	0.912	0.914	0.905	0.905	0.929
Combined coverage rate	0.64					
Combinatorial consistency	0.858					

Note : ● Representing the existence of core conditions;• Representing the existence of edge conditions ;◎ represents the core condition does not exist (negative) ;◎ represents that the marginal condition does not exist (negative) ; 'Blank' represents that the condition can exist or not exist.

V. Communication Strategies to Enhance the Effectiveness of Overseas Communication of Chinese Culture

Acupuncture and moxibustion, as a representative of Chinese culture, was analyzed qualitatively and quantitatively in the above chapter to discuss the situation faced by Chinese culture in the process of overseas dissemination by analyzing the factors influencing the overseas dissemination of acupuncture and moxibustion. On this basis, this chapter will propose strategies to enhance the overseas communication power and influence of Chinese culture.

V. A. Content Innovation and Localization Strategy

In order to enhance its appeal, it is necessary to constantly innovate the forms of expression of Chinese cultural content. In addition, cross-field cultural integration, such as combining traditional culture with modern popular elements, can create cultural products with a sense of freshness and modernity; such diversification and innovation not only help to expand the audience, but also enhance the competitiveness and influence of Chinese culture in the international arena.

By understanding and studying the cultural background, aesthetic orientation and values of different countries and regions, and by creating and adapting targeted contents, Chinese culture can be better adapted to and integrated into local societies. In addition, through cooperation with local cultural institutions, artists and media for joint creation and promotion, the affinity and acceptance of cultural content can be effectively enhanced, and such targeted localized adaptation can help strengthen the influence and penetration of Chinese culture in overseas markets.

V. B. Optimization and integration of communication channels

Through the integration of multiple communication platforms and the formation of a linkage effect, the coverage and influence of communication can be significantly expanded, and the combination of traditional media and new media can realize a wide range of communication effects among different audience groups. In addition, the linkage and cooperation between different new media platforms, such as the joint promotion of social media and streaming media platforms, can maximize the communication effect through their respective advantages and characteristics. This kind of multi-platform linkage and integrated communication can realize resource sharing and complementary advantages, and enhance the efficiency and influence of Chinese culture dissemination overseas. The emergence of various new platforms and technologies has provided more innovative means and methods for cultural communication.

V. C. International cooperation and cultural exchanges

By building various forms of cultural exchange platforms, more opportunities and channels can be provided for the display and dissemination of Chinese culture. These platforms not only provide a window for foreigners to understand Chinese culture, but also build a bridge for Chinese and foreign cultural workers to communicate and cooperate, and through diversified forms and contents of exchanges, they can enhance the influence and attraction of Chinese culture in the international arena.

Through the synergistic cooperation between the government and private forces, a stronger communication synergy can be formed. Government departments can provide policy support and resources. Private organizations and enterprises can give full play to their flexibility and creativity, and widely disseminate Chinese culture through market-oriented operation and public welfare activities. In addition, by promoting interaction and cooperation between Chinese and foreign folk cultural groups, they can further deepen Chinese and foreign cultural understanding and identity through jointly organizing cultural activities and carrying out exchange programs, so as to jointly promote the dissemination and development of Chinese culture in the international arena.

VI. Conclusion

In order to explore the dissemination effect and acceptance of Chinese culture overseas, this paper takes Chinese acupuncture and moxibustion, which is a representative of the overseas dissemination of Chinese culture, as the research object, and adopts the entropy-weight-TOPSIS method and qualitative comparative analysis to carry out the research and analysis of the overseas dissemination effect of Chinese acupuncture and moxibustion.

The entropy weight-TOPSIS method is used to analyze the overseas communication effect of Chinese medicine and acupuncture. The entropy weight method was used to determine the weights of each evaluation index of the overseas dissemination effect of Chinese medicine and acupuncture in English translation. Among the first-level indicators, the weights of cognitive, behavioral and attitudinal indicators were 54.03%, 31.1% and 14.87%, respectively. In the similarity and closeness of the overseas communication effect of each content module of Chinese medicine and acupuncture, the average score of the communication effect of each content module of

Chinese medicine and acupuncture is 0.11, which indicates that the overall communication effect of Chinese medicine and acupuncture overseas is not satisfactory. During the period of 2005-2020, the overall trend of overseas communication of TCM and acupuncture was characterized by fluctuating decline and short-term silence, but during the period of 2020-2025, the overseas communication effect of TCM and acupuncture experienced a rebound and rebound, and the score of the overseas communication effect was improved to 0.1289.

Qualitative comparative analysis was used to further carry out the analysis of the overseas communication effect of TCM acupuncture. The intermediate solution obtained had six groupings had six groupings, namely CF*IF*PF*CEF, IF*EF*PF*CEF, IF*EF*MF*CEF, IF*PF*CEF*MF, EF*PF*CEF*MF, CF*IF*EF*PF*MF, and the consistency of the corresponding individual groupings was 0.904, 0.912, 0.914, 0.905, 0.905, and 0.929, and the overall consistency was 0.858. Acupuncture industry is a core condition that plays an obvious role in the overseas dissemination of TCM acupuncture, and five out of six groupings of conditions included acupuncture industry factors, four of which existed as core conditions. Participant factors and efficacy factors had 5 groupings, of which 3 appeared as core conditions and 2 appeared as marginal conditions, which proved that participant factors and efficacy factors were intrinsic factors affecting the spread of Chinese medicine and acupuncture and played a more significant role in influencing the spread of Chinese medicine and acupuncture. Environmental factors and media factors had four groupings, of which three appeared as core conditions and one appeared as a borderline condition, which also had a more significant effect on the overseas dissemination of TCM and acupuncture. Cultural factors did not appear in the grouping as a core condition, and there were only two groupings as a marginal condition, in which the influence of acupuncture cultural factors was the weakest.

Finally, combining the above results of the analysis of the effect of overseas communication of Chinese medicine and acupuncture, we propose a communication strategy with content innovation and localization strategy, optimization and integration of communication channels, and international cooperation and cultural exchange as the main content, which provides a direction guide and idea reference for the development of overseas communication of Chinese culture.

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