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The Application of AHP in College Propaganda Work

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In this article, the college propaganda work in communication science horizon is carried out a communication effect evaluation by using mathematical methods. The basic channels of college propaganda and the effect index of each channel are clarified through the literature research and the field research of the related colleges and universities. The weight of propaganda channel and the weight of each propaganda channel effect index are determined by using AHP. The calculated result is that television publicity effect is the best, followed by newspapers, network and etc. I suggest that a combined transmission mode of television, newspaper, network and interpersonal propaganda can be used in the college propaganda, and an appropriate tendency to TV and network is allowed.

1. Introduction

College propaganda is a kind of active communication behavior that the colleges and universities are as information source and communication subject. It belongs to the research category of communication science, which attracts high attention of colleges and universities.

Having an overview of college propaganda work, the main duties are as follows: undertaking all kinds of daily propaganda work of the party committee and the implementation of the Party's guidelines and policies, publicizing and reporting various events and activities at inside and outside of the colleges and universities, carrying out the ideological and political education to staff and students improving college spiritual civilization construction, keeping on the right side of the state regulations, adhering to the principle of seeking truth from facts, giving prominence to timeliness, reality, truthfulness, guided by positive publicity, letting students, parents and society know and approve colleges and universities. Along with the college expansion and the negative growth of college entrance examination population in recent years, the enrolment in higher institutions has become a top priority of ordinary colleges and universities. And college propaganda work then shoulders the responsibility of college enrollment to launch periodic theme propaganda.

In this article, five basic propaganda channels including 17 propaganda effect indexes are analyzed. The weight of each effect index is determined by using AHP. According to the weight size to adjust the propaganda strategy, I hope it could provide a basis for college propaganda.

2. The Construction of College Propaganda System

College propaganda couldn't be in progress without TV, newspapers, network, radio and the crowd. Which channel or which channels the colleges and universities may choose depend on the propaganda effect of those channels. Each propaganda effect has different index (The specific propaganda effect indexes are shown in table 1). The importance of these propaganda indexes could be judged by experts' opinion. The weight of each index could then be determined by using AHP.

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Table 1: College propaganda channels and the effect index of each propaganda channel

Propaganda channels	the effect index of each propaganda channel
TV propaganda	picture quality, play time, time, audience rating
newspaper propaganda	article quality, layout position, printing quality , circulation
network propaganda	article quality, location, website influence
broadcast propaganda	Play time, article quality, listening number
interpersonal propaganda	Student propaganda, parent propaganda, mass propaganda

Analytic hierarchy process (AHP) is presented in the 1970s which is an effective and multiobjective planning method, and also an optimization decision method. College propaganda work is carried out a quantitative analysis by using AHP. The specific process is as follows:

(1) Establish analytic hierarchy structure diagram of college propaganda

On the basis of propaganda work's characteristics and property, the college propaganda channels and each effect index is stratified.(The specific details are shown in diagram 1)

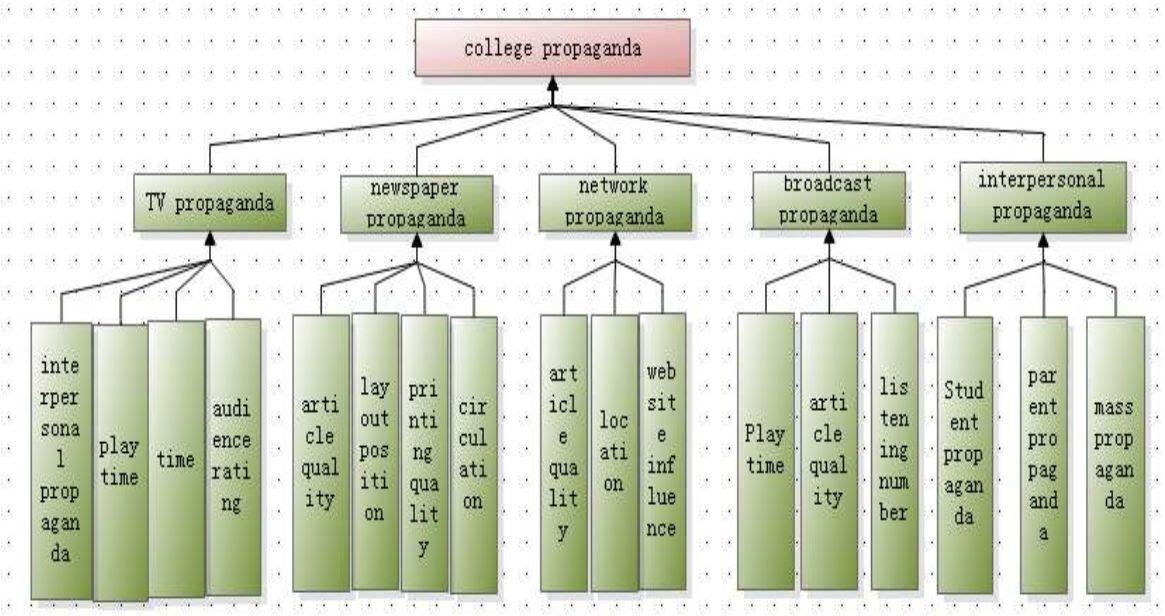

Diagram 1: analytic hierarchy structure diagram of college propaganda

(2) Structure the comparison matrix of each propaganda channel effect index and the comparison matrix of each propaganda channel; calculate the weight of each propaganda channel and each effect index.

According to the analytic hierarchy structure diagram, the upper level as the guideline, using multiple comparison to certain index could determine the important relationship between two indexes, which are generally shown with scale value. (The specific details are shown in table 2)

Table 2: 1-9 scale value

scale value a_{ij}	1	2	3	4	5	6	7	8	9
$i:j$	the same		slightly stronger		stronger		remarkably stronger		absolutely stronger

Notes: (1) number 2, 4, 6, 8 signify the importance between two adjacent levels.

(2) number $\frac{1}{2},\frac{1}{3},\cdots,\frac{1}{9}$ signify that the ratio of the comparison importance of $j:i$ is the reciprocal number of $i:j$.

On the basis of 1-9 scale value and expert evaluation, we can get the comparison matrix, calculate the weight of each propaganda channel effect index and the weight of each propaganda channel using geometric mean. The specific details are shown in table 3-8.

Table 3: Comparison matrix O and the weight of each propaganda channel

O	A_1	A_2	A_3	A_4	A_5	product in each line	square root	each index weight
A_1	1	2	4	9	3	216	2.930	0.440
A_2	1/2	1	2	7	2	14	1.695	0.254
A_3	1/4	1/2	1	3	1	3/8	0.822	0.123
A_4	1/9	1/7	1/3	1	1/5	1/945	0.254	0.038
A_5	1/3	1/2	1	5	1	5/6	0.964	0.145

Table 4: Comparison matrix A1 and the effect index weight of TV propaganda

A_1	B_1	B_2	B_3	B_4	product in each line	square root	each index weight
B_1	1	3	5	1	15	1.968	0.394
B_2	1/3	1	2	1/3	2/9	0.687	0.137
B_3	1/5	1/2	1	1/5	1/50	0.376	0.075
B_4	1	3	5	1	15	1.968	0.394

Table 5: Comparison matrix A2 and the effect index weight of newspaper propaganda

A_2	C_1	C_2	C_3	C_4	product in each line	square root	each index weight
C_1	1	1/2	1	1/3	1/6	0.639	0.141
C_2	2	1	2	1/2	2	1.189	0.263
C_3	1	1/2	1	1/3	1/6	0.639	0.141
C_4	3	2	3	1	18	2.060	0.455

Table 6: Comparison matrix A3 and the effect index weight of network propaganda

A_3	D_1	D_2	D_3	product in each line	square root	each index weight
D_1	1	1/3	1/5	1/15	0.405	0.110
D_2	3	1	1/2	3/2	1.145	0.309
D_3	5	2	1	10	2.154	0.581

Table 7: Comparison matrix A4 and the effect index weight of broadcast propaganda

A_4	E_1	E_2	E_3	product in each line	square root	each index weight
E_1	1	2	1/2	1	1	0.286
E_2	1/2	1	1/4	1/8	0.5	0.143
E_3	2	4	1	8	2	0.571

Table 8: Comparison matrix A5 and the effect index weight of interpersonal propaganda

A_5	F_1	F_2	F_3	product in each line	square root	each index weight
F_1	1	2	1/3	2/3	0.874	0.230
F_2	1/2	1	1/5	1/10	0.5465	0.122
F_3	3	5	1	15	2.466	0.648

(3) Carry out the consistency check to each calculated effect index and the results of propaganda channel weight.

Due to the certain one-sidedness of people's understanding to objective things, comparison matrix usually doesn't have consistency when determining weights. So it is necessary to carry out the consistency check. When consistency ratio gets that small, comparison matrix could be thought to pass the consistency check. When consistency ratio is $CR = \frac{CI}{RI}$, and $CI = \frac{\lambda_{\max} - n}{n-1}$ is consistency index, $\lambda_{\max}$ is the maximum eigenvalue of comparison matrix, RI is the random consistency index (The specific details are shown in table 9).

Table 9: Random consistency index

n	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

Generally, when $CR = \frac{CI}{RI} < 0.1$, comparison matrix is thought to pass the consistency check. Through calculating, we could get all the effect indexes of each propaganda channel, the maximum eigenvalue of comparison matrix, consistency index and consistency ratio. The specific details are shown in table 10.

Table 10: The maximum eigenvalue of each comparison matrix, consistency index and consistency ratio

comparison matrix	A	B	C	D	E	O
$\lambda_{\max}$	4.002941	4.012694	3.003593	3.000008	3.004269	5.040164
CI	0.000980	0.004231	0.001796	0.0000037	0.002134	0.010041
CR	0.001089	0.004701	0.003097	0.0000065	0.003680	0.008965

All of the CR less than 0.1 indicates that the comparison matrix has already passed the consistency check. So we could be certain that all the effect indexes and the weight of each propaganda channels have passed the check. The summarized effect indexes of propaganda channels and the weight are shown in table 11.

Table 11: Each effect indexes and the weight of college propaganda channel

propaganda channel	weight of propaganda channel	effect index	effect index weight
TV propaganda	0.440	picture quality	0.394
		play time	0.137
		time	0.075
		audience rating	0.394
newspaper propaganda	0.254	article quality	0.141
		layout position	0.263
		printing quality	0.141
		circulation	0.455
network propaganda	0.123	article quality	0.110
		location	0.309
		website influence	0.581
broadcast propaganda	0.038	Play time	0.286
		article quality	0.143
		listening number	0.571
interpersonal propaganda	0.145	Student propaganda	0.230
		parent propaganda	0.122
		mass propaganda	0.648

From the table above, we know that TV propaganda weight is the biggest one, which is 0.440. That is to say, TV propaganda channel is able to achieve the best effect for college propaganda work, which should be given more focus. For further observation to the effect index of TV propaganda, picture quality and audience rating have the biggest weights. Therefore, when using TV propaganda channel, picture quality should be paid fully attention. Colleges and universities should think carefully and repeatedly about the material selection, theme selection, delivery time, the main receivers and ect. in making video AD. On the other hand, the TV channel that has high audience rating should have a priority to be chosen. There is no doubt about this, because audience rating is the important guarantee of communication effect. Followed by newspaper propaganda, the weight is 0.254, and among the effect indexes, circulation weight is the largest one. It has the same reason consistent with TV audience rating. Research universities have cooperated with industry newspaper and regional mainstream newspapers, sending manuscripts regularly to publicize. So the effect index weight should be based on to make appropriate screening of newspaper circulation and article layout to ensure the best communication effect. The weights of interpersonal propaganda and network propaganda are relatively small, and broadcast propaganda effect is the worst.

3. Suggestions

It is rare in the study of communication science using mathematical method to carry out the quantitative analysis and evaluation of the spread effect of propaganda work. It is a new try for the author to write this kind of article. The study samples are not comprehensive, and the research process may have defects. However, quantitative analysis of the transmission effect has a great signality to college propaganda. After determining the weight in the research process, expert scoring method could be adopted to transform the final effect into scores. Propaganda effect could be judged whether it is good or bad by the score height. In brief, colleges and universities can use a combination way of TV, internet, newspapers, broadcast, and interpersonal propaganda to strive to cover all the channels of the audience. At the same time, transmission content should be consistent and relevant. Choose suitable communication form of different channels and the carrier in order to get better propaganda effect.

In the current new media environment, under the circumstance of continuously rising of network toll through the mobile phones and other mobile terminal access, colleges and universities should fully pay attention to the importance of “fingertip reading”, study the new information ways of audience, place emphasis upon the development of marketable products continuing to play ideological effect of college propaganda work. In view of the author’s limitation to communication research, and at the same time because of the simple practices of universities’ communication model, in this article, the author doesn’t bring it into the study range, which therefore becomes a new direction and trend to study college propaganda work in the future.

In news propagation behavior research in colleges and universities, fully using modern technology, the data affecting communication effect is collected and sorted out, setting up the computer data processing system, using the appropriate method to establish analysis model, which can effectively improve the study efficiency. At the same time, it can provide important reference for long-term planning theme, preventing malignant spread, improving propaganda or making decisions.

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