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The Influence of Citizens' Online Participation on Policy Formulation Based on the Structural Equation Model

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Abstract: With the continuous deepening of China's democratic political process, the popularity and development of the Internet, it has gradually become an important channel for citizens to convey their ideas, express their interests, and participate in the formulation of public policies. Targeted at such a social status quo, this research involves empirical analysis to determine citizens' participation in public policy formulation in the online environment. According to the results of the empirical analysis, citizens' cognitive level, individual expectation, and social attitude would all impact government openness and transparency, and hence, the effectiveness and efficiency of citizens' online participation in policy formulation. Furthermore, it seems that policy perception and citizen participation played a mediating role to some extent in the increase in government openness and transparency. It is expected that the findings of this research could provide some references for public policy formulation in the future.

Keywords: citizens' online participation, policy formulation, education policy, structural equation model.

基于结构方程模型的公民网络参与对政策制定的影响

摘要：随着我国民主政治进程的不断深入，互联网的普及和发展，逐渐成为公民表达思想、表达利益、参与公共政策制定的重要渠道。针对这样的社会现状，本研究通过实证分析来确定网络环境下公民参与公共政策制定的情况。实证分析结果显示，公民的认知水平、个人期望、社会态度都会影响政府的公开性和透明度，进而影响公民在线参与政策制定的有效性和效率。此外，政策认知和公民参与似乎在一定程度上对政府公开和透明度的提高起到了中介作用。 预计本研究结果可为今后公共政策的制定提供一定的参考。

关键词：公民在线参与、政策制定、教育政策、结构方程模型.

1. Introduction

Since China's reform and opening up, socialism with specific Chinese characteristics had entered a new era, which is presented by the rapid and stable development of the economy and the corresponding improvement of the people's living standards. The release of market economic space and the transfer of corresponding civil society organizations have opened space for the development of civil society, or in other words, provided a rare opportunity for the development

of Chinese politics, including both civil political participation and the democratic decision-making of the government. In addition, the Chinese political system reform has rebuilt the relationship between the state and society, and still the relationship between society and citizens. It should be clear that socialism with Chinese characteristics ushered in a period with different social contradictions, under which the Chinese government would face severe, complex, and long-term tests [6]. To put it more specifically, since China's reform and opening, its' social and interest structure has undergone fundamental changes. Different stakeholders began to form in the country, resulting in the derivation of various social problems and the deepening of social contradictions [2]. With the advent of the age of interest game, the profit structure of society has undergone rapid changes, and the original hierarchical structure of society has faced structural changes from the dimensions of system, economy, culture, and technology, all of which have provided favorable conditions for the existence of civil society [16]. Overall, driven by reforms in both economic development and the political system, Chinese civil society has gradually formed a growing awareness of citizens' participation in public policy formulation.

However, it seems that the traditional channels for citizens to participate in public policy formulation seemed not to be enough. The rapid development of information technology in China provides advanced technical means for citizens to participate in public political affairs [1]. With easier and cheaper access to the Internet in China, the number of Chinese Internet users is increasing, and the popularity rate has grown significantly. According to the survey on the development status of the Internet industry led by the China Internet Network Information Centre (CNNIC), the 47th Statistical Report on the Development Status of the Internet in China published in March 2021 showed that the size of China's Internet users had reached 989 million by December 2020, an increase of 85.4 million compared to March 2020, and the Internet penetration rate had risen to 70.4%, an increase of 5.9% compared to March 2020 [24]. All these figures prove that the Internet plays an indispensable role in today's modern society. The Internet is a big platform for social information, and hundreds of millions of Internet users get and exchange information on the Internet, which will have an important impact on their way of seeking knowledge, their way of thinking, and their values, especially on their views on the country, society, their work, and their life. As also pointed out in [21], firms' innovation processes are all based on the same principles or similar frameworks, which is crucial for public participation in the public policymaking process [4], [18]. The continuous enrichment and improvement of Internet applications, the expansion and enhancement of interactive commentary functions, such as the widespread use of commentary apps such as blogs, forums, microblogs, WeChat, and friends' circles, as well as the emergence of various new live broadcast platforms, have made public opinion on the Internet an important part of social opinion [17]. Obviously, the Internet has created a unique and dynamic space for public discussion and has attracted many Internet users to participate in the discussion [3]. As the Internet enables the emergence of a new political public space, the public use of Internet tools has evolved into direct participation. People have more opportunities to express themselves in public policymaking and can also amplify their voices online and form a common force to realize their interests [5]. However, it should be clear that the impacts of online political participation in developing countries seem to be more obvious than those in developed countries [7]. In those developed centuries, there is a wide range of ways for citizens to participate in politics, and thus, the thrill of Internet users' indulgence on the Internet is not very strong, and accordingly, the impact is not quite obvious [15]. In developing countries, such as China, many historical and practical reasons limited the avenues for citizens' political participation, and of course, the relatively liberal freedom of the Internet is regarded as an important outlet of civil discourse and civil power. Thus, it is not difficult to understand that the Internet has become a huge conduit for the influx of public opinion and a powerful tool for netizens to intervene in real political life in developing countries.

However, it should be clearly recognized that although the Internet has built a broader platform for citizens to participate in the formulation of citizen policies, there are still some shortcomings in many aspects because this new form of citizen participation is still in the initial stage of development in China, which will inevitably bring negative impacts and challenges, such as irrational and non-standard public online participation.

Taking all of the above into consideration, this research intends to use the structural equation model to explore the specific relationship between public policy formulation and citizens' online participation by focusing on Chinese citizens' online participation and education policy formulation in China. It is expected that the findings in this research could provide some references for the Chinese government to improve public political participation through the Internet in China.

2. Related Theories and Definitions

First, it is the governance theory. As stated in [9], the word 'governance' originally meant to control, steer, direct, guide, and manipulate. In the field of political science, governance, as a management tool of government, usually refers to national governance. Governance refers to the way the government behaves and the mechanisms used to regulate the government's

behavior through some means, namely, how the government uses its state power (governance) to manage the country and society. In the field of public administration, according to [8], governance is an activity supported by a common goal, and the main body of the activity may or may not be the government. In other words, compared with rule, governance has a richer connotation, including both formal and governmental administrative mechanisms, as well as informal, non-governmental administrative mechanisms. Still, it should be mentioned that the connotation of public governance, that is, in the process of dealing with public affairs, the total dependance on the power of the government is irrational. Other means of governance methods such as the power of international organizations, private sectors, social organizations, and individual citizens should also be involved.

Second, it is the participatory democracy theory. With the increasing shortcomings of the previous representative system exposed in government politics the impact of Western money worship and individualism, citizens' autonomy and enthusiasm for political participation have been continuously improved, and the theory of participatory democracy has begun to emerge and develop continuously, causing new changes in western citizens' political participation. According to [13], political participation should involve universal, direct, equal, and extensive participation of citizens. Effective civic participation can only be achieved by truly transforming the political blueprint shared by the people into the basis for political decision-making. As stated in [10], the main task of democracy is to promote citizen participation in politics, rather than the participation of a minority of elites, which is the key to liberal democratic theory. Only when everyone cares about political events and fights for their legitimate rights and interests will society be more democratic and fairer, and political participation will be more orderly. It was still argued in [13] that politics and political participation are reciprocal, and one can perhaps generalize the mode of participation as maximizing input [13].

Third, it is the policy network theory. In addition to the government, other stakeholders are related to public policies. This policy network theory mainly focuses on the stakeholders of different subjects. Because of limited policy resources such as authority, capital, information, and knowledge, the relationship among different subjects is formed by mutual dependance This relationship should be equal, relatively stable, and interdependent. These subjects form organizations and interest consortia and conduct equal dialogs and consultations on issues of common concern by establishing institutionalized or non-institutionalized interactive methods. Practical insights for policymakers and business managers in Visegrad economies were stated in [22], which means that the policy demands of various subjects can be reflected in the whole process of policy formulation and implementation. Accordi g to [14], a policy network is a unity that includes network nodes, network links, network rules, network boundaries, and network environment [14]. Different policy networks are due to the differences in these elements and their arrangement and combination. Therefore, the policy network structure can be considered as a collection of relationships formed by policy-related groups on the basis of the policy resources they hold.

Furthermore, this research clarifies the related concepts related to public policy and online participation in public policy behavior, which are summarized as follows:

- Public policy: Public policy is a program selected and formulated by public authorities through the political process to solve public problems and achieve public goals in order to achieve public interests.
- Public policy formulation: To regulate the behavior of organizations and individuals for certain sociopolitical, economic, and cultural goals, political parties and the government are required to use normative documents such as laws, regulations, and plans, the process of which is just public policy formulation.
- Citizen's participation: Citizens or citizen groups of a country participate in public decision-making activities through direct or indirect means on issues related to their interests or major issues involving public interests.
- Citizen's online participation: It refers to the behavior of citizens or citizen groups directly or indirectly participating in the formulation of national policies and influencing the policy process through the Internet.

2.1. Hypotheses

The basic feature of information is asymmetry regardless of time or space. The influence of the degree of publicity of government information and the degree of symmetry of policy information on the behavior of citizens participating in the policy agenda has become a consensus among theoretical circles. The government has a lot of information, meaning that the government is on the side of the information advantage while the citizens are on the side of the information disadvantage. However, the government often intentionally does not disclose some information to the public. Although citizens have a certain right to know, it is difficult to obtain important information and has no essential impact on decision-making results and policy trends [19]. For citizens to participate in the policy network, information occlusion is a key factor affecting their' cognitive level, which prevents them from making correct judgments on the government policy behavior. Furthermore, citizens, as participating

subjects, are bounded rational. Due to their differences in knowledge backgrounds and insufficient information, citizens' awareness of policy issues is limited. The cognitive level of citizens will significantly affect the effectiveness of citizen participation, which is a key factor affecting the division of citizen participation models.

Citizens' trust in the government and the degree of closeness between policies and themselves jointly affect the costs and benefits for citizens' policy participation, and then affect the expectations of policy subjects. According to [23], the lack of significance of most collaborative activities suggests that radical and incremental innovative R&D is not feasible, further demonstrating the importance of public policy online engagement. Scholars conducted in-depth research on cooperation issues through empirical methods and proposed that contribution, vision, and intimacy are the key variables for the ultimate achievement of cooperation [25]. However, as proposed in [12] and [20] that a benign government-citizen interaction is difficult to achieve in traditional buying and selling relationships. To establish intimacy, three tasks should be accomplished, mutual trust, information sharing, and the establishment of a strong partner team. Among them, he placed mutual trust in the first place, which shows the importance of the level of government trust. Mutual trust here is not only about information disclosure. As far as the government is concerned, it can consider issues from the interests and positions of citizens, that is, it involves the government's tolerance. As far as citizens are concerned, they believe that the policy recommendations they put forward will be adopted, and they believe that the government is trustworthy, i.e, individual participation [11]. Overall, if the trust relationship between the government and citizens is benign, citizens will be freer to express their views on government phenomena and public affairs. If there is distrust between the government and citizens, citizens will tend to reduce their political exchanges with the outside world for self-protection, and the social exclusion attribute of the policy network will be highlighted.

Taking the above into consideration, this research proposed the following hypotheses:

H1: Cognitive level has a significant positive impact on government openness.

H2: Expectation perception has a significant positive impact on government openness.

H3: Social attitudes have a significant positive impact on government openness.

H4: Cognitive level has a significant positive effect on government transparency.

H5: Expectation perception has a significant positive effect on government transparency.

H6: Social attitudes have a significant positive impact on government transparency.

H7: Policy perception has a significant positive mediating effect between cognitive level, expectation perception, social policy, and government openness and transparency.

H8: Citizen participation has a significant positive mediating effect between cognitive level, expectation perception, social policy, government openness, transparency.

H9: Individual participation has a significant positive moderating effect on policy perception, citizen participation, and government openness and transparency.

H10: Government tolerance has a significant positive moderating effect on policy perception, citizen participation, and government openness and transparency.

3 Methods/Materials

3.1. Research Model

Targeted at the above analysis, this research aims to involve the structural equation model (SEM) to verify the hypothesis, which can be briefly described as shown in Figure 1.

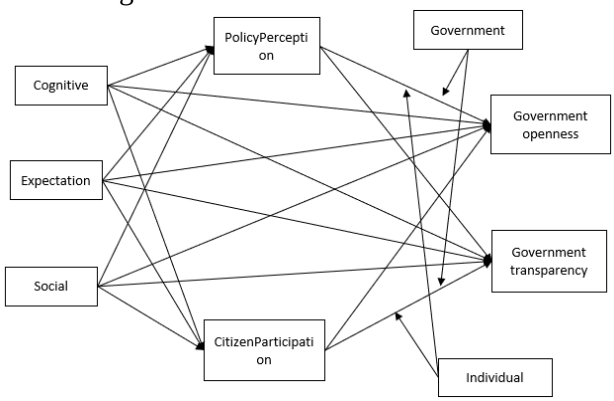

Fig. 1 Research framework (The author's elaboration)

To be specific, this structural equation model includes a total of latent variables, namely cognitive level, expectation perception, social attitude, and government openness. The specific variables are described in Table 1.

Table 1 Research variables (The author's elaboration)

Type of variables	Research variables
Independent variable	Cognitive level
	Expectation
	Social attitude
Dependent variable	Government openness
	Government transparency
Mediating variables	Policy Perception
	Citizen Participation
Moderator variables	Individual participation
	Government tolerance

3.2. Sample and Data Collection

3.2.1. Sample Selection

This research takes Chinese education policy

formulation as an example to collect the analysis of related events by Internet public opinion to illustrate the potential impact of online public opinion on public policy formulation.

3.2.2. Sample Size

This research used Cochran's formula to calculate the sample size required. According to Cochran's formula:

$$n = z^2pq/e^2 \quad (1)$$

where n is the required sample size, e is the level of precision, p is the estimated proportion of the population with the relevant attribute, $q = 1-p$ is the standard deviation of the proportion with that property, and z is the standard z-score related to the level of precision. As a result, the number of responses in the sample would be 366.

3.2.3. Data Source

This research uses the questionnaire survey method to collect the first-hand data for quantifying the impact of citizens' online participation on public policy formulation. To be specific, based on the theoretical hypothesis put forward in the above and combining the specific characteristics of the research objects, this research designed a specific questionnaire for collecting the first-hand data. When designing the questionnaire, special attention was paid to the objectivity of the items, to ensure the authenticity of the results to the greatest extent and accordingly ensure that the research hypothesis is verified reasonably. Still, the questionnaire will be designed for further analysis by the Likert scale score questions (score 1-5 representing totally disagree, disagree, fair, agree, and strongly agree, respectively). The specific items coded in this questionnaire mainly measure nine variables, that is, cognitive level, perception of expectations, social attitude, government openness, government transparency, policy perception, citizen participation, individual participation, and government tolerance, which are briefly shown in Table 2.

Table 2 Items in the questionnaire (The author's elaboration)

Variable	Code	Measurement Standard
Cognitive Level (CL)	CL1	You will personally pay attention to social hotspots.
	CL2	In the recent past, have you actively followed social hotspots?
	CL3	Soon, you will express your views on some hot spots on the Internet.
Expectation Perception (ET)	ET1	Do you think public opinion will have a positive impact on the formulation of educational policy?
	ET2	Do you think the current education policy has been influenced by your public opinion?
	ET3	Do you think the Kunshan Longge incident will help improve China's self-defense legislation?
Social Attitude (SA)	SA1	In the new media public opinion environment, do you think the comments made by the people around you tend to be more positive.
	SA2	Do you think online comments need censorship?
	SA3	Your attitude toward the government is positive.
Government Openness (GO)	GO1	NGOs are involved in the formulation of government education policies.
	GO2	Do you think the government will consider the views of all sectors of society in the designation process of considering education policies.
	GO3	The government will provide all sectors of society with ways and means to participate in the designation of education policy.
Government Transparency (GY)	GY1	You think your voice is being heard in the formulation of government education policy.
	GY2	Do you think the government will make the entire process of making education policy public?
	GY3	Do you think the government will solicit opinions from multiple channels at all stages of educational policy formulation
Policy Perception (PP)	PP1	You will pay attention to the government's proposal on education policy.
	PP2	You are familiar with the entire process of the government's promotion of education policy.
	PP3	You will spread your views on education policy online.
Civic Engagement (CP)	CP1	You will express your views on the development of government education policy.
	CP2	You will positively comment on some advantages and disadvantages of government education policy.
	CP3	You will use online comments, complaints, and other methods to express your different opinions on education policies.
Individual Participation (IP)	IP1	Do you think you will influence the direction of public opinion to a certain extent?
	IP2	You think you have been involved in the development of government education policy.
	IP3	You think you have good civic media literacy.
Government Tolerance (GC)	GC1	You think the government will accept social disapproval.
	GC2	You think you have freedom of opinion.
	GC3	You think the government will represent the interests of all citizens.

Then, the following quantitative results would be obtained based on the data from this questionnaire. In addition, it should be mentioned that the research will involve SPSS 21.0 to complete the summary and empirical analysis of the first-hand data obtained from the recovered questionnaire in this survey.

4. Results and Discussion

4.1. Reliability and Validity Analysis

4.1.1. Reliability Analysis

This research first performs a reliability analysis of overall statements in the questionnaire. The results of

the reliability of the overall questionnaire are briefly described in Table 3.

Table 3 Results of the reliability analysis of the overall questionnaire (The author's elaboration)

Statements	Cronbach's Alpha	Number of items
Overall questionnaire	0.805	26

According to the results of the reliability analysis, the overall reliability coefficient is 0.805, indicating that the reliability of the questionnaire is relatively high. Therefore, it is comprehensively indicated that the reliability of the questionnaire was acceptable, and thus, it can be used for further analysis.

Furthermore, this research also conducts a reliability analysis of the different aspects in the questionnaire. The results are briefly described in Table 4.

Table 4 Results of reliability analysis of specific aspects (The author's elaboration)

Statements	Cronbach's Alpha	Number of items
Cognitive level	0.854	3
Expectation	0.722	2
Social Attitude	0.719	3
Government openness	0.744	3
Government transparency	0.748	3
Policy Perception	0.704	3
Citizen Participation	0.718	3
Individual participation	0.747	3
Government tolerance	0.805	3

According to Table 4, the reliability coefficients of all aspects (cognitive level, internal expectation, social attitude, government openness, government transparency, policy perception, citizen participation and individual participation) are above 0.7 (0.854, 0.722, 0.719, 0.744, 0.748, 0.704, 0.718, 0.747, an 0.805, meaning that the reliability of all specific aspects are acceptable, which further proves that the reliability of the questionnaire is acceptable. Thus, it is reasonable to further analyze the data obtained from this questionnaire.

Overall, the results of reliability analysis prove that the reliability of the questionnaire is acceptable, and thus, it is possible to further analyze the data obtained from this questionnaire in the survey.

4.1.2. Validity Analysis

This research further uses the KMO and Bartlett's test to compare the results of the questionnaire. The results of the KMO and Bartlett's test are briefly described in Table 5.

Table 5 Results of the KMO and Bartlett's test (The authors's elaboration)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.846
Bartlett's Test of Sphericity	**Approx. Chi-Square**	3159.098
	df	325
	Sig.	0.000

According to the results of the validity analysis, the KMO is 0.846, which has met the requirements of over 0.6. Still, the Sig. value of Bartlett's sphericity test is 0.000, which is less than the significance level of 0.05, meaning that the original hypothesis that the correlation coefficient matrix is an identity matrix should be rejected, and thus, there is a correlation between variables. In summary, the above empirical results indicate that it is possible to involve the questionnaire items in this survey for further analysis.

4.2. Findings

4.2.1. Correlation Analysis

Before the formal discussion of the influencing mechanism among different independent variables, this research involved correlation analysis for an initial understanding of the potential among different independent correlations among different independent variables However, it should be mentioned that correlation between variables could only be discussed under a certain level of significance, for example, Sig. (two-tailed) < 0.05, so as to ensure the significance of the correlation results. The output from SPSS 21.0 is summarized in Table 6.

Table 6 Results of the correlation analysis (The author's elaboration)

		GO	GT	CL	EP	SA
GO	Pearson Correlation	1	0.430**	0.415**	0.341**	0.328**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	366	366	366	366	366
GT	Pearson Correlation	0.430**	1	0.346**	0.227**	0.206**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	N	366	366	366	366	366
CL	Pearson Correlation	0.415**	0.346**	1	0.273**	0.297**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	366	366	366	366	366
EP	Pearson Correlation	0.341**	0.227**	.273**	1	.173**
	Sig. (2-tailed)	0.000	.000	.000		.001
	N	366	366	366	366	366
SA	Pearson Correlation	0.328**	.206**	.297**	.173**	1
	Sig. (2-tailed)	.000	.000	.000	.001	
	N	366	366	366	366	366

** Correlation is significant at the 0.01 level (2-tailed).

According to the results of the correlation analysis, the Pearson correlation coefficient between cognitive level and government openness is 0.415 at a significance level of 0.01, indicating a positive correlation between cognitive level and government openness. In other words, the change in cognitive level will lead to a change in government openness in the same direction. The Pearson correlation coefficient between expectation and government openness is 0.341 at the significance level of 0.01, indicating a positive correlation between expectation and government openness. In other words, the change in expectation will lead to the change in government openness in the same direction. The Pearson correlation coefficient between social attitude and government openness is 0.328 at the significance level of 0.01, indicating a positive correlation between social attitude and government openness. In other words, a change in social attitude will lead to a change in government openness in the same direction. The Pearson correlation coefficient between cognitive level and government transparency is 0.346 at a significance level of 0.01, indicating a positive correlation between cognitive level and government transparency. In other words, the change in cognitive level will lead to a change in government transparency in the same direction. The Pearson correlation coefficient between expectation and government transparency is 0.227 at the significance level of 0.01, indicating a positive correlation between expectation and government transparency. In other words, the change in expectation will lead to the change in government transparency in the same direction. The Pearson correlation coefficient between social attitude and government transparency is 0.206 at the significance level of 0.01, indicating a positive correlation between social attitude and government transparency. In other words, a change in social attitude will lead to a change in government transparency in the same direction.

To date, this research has established an initial understanding of the data related to the variables . Further discussion could be continuously involved in the research.

4.2.2. Initial Structural Equation Model

First, this research summarizes the initial structural equation model. The output from SPSS 21.0 is summarized in Figure 2.

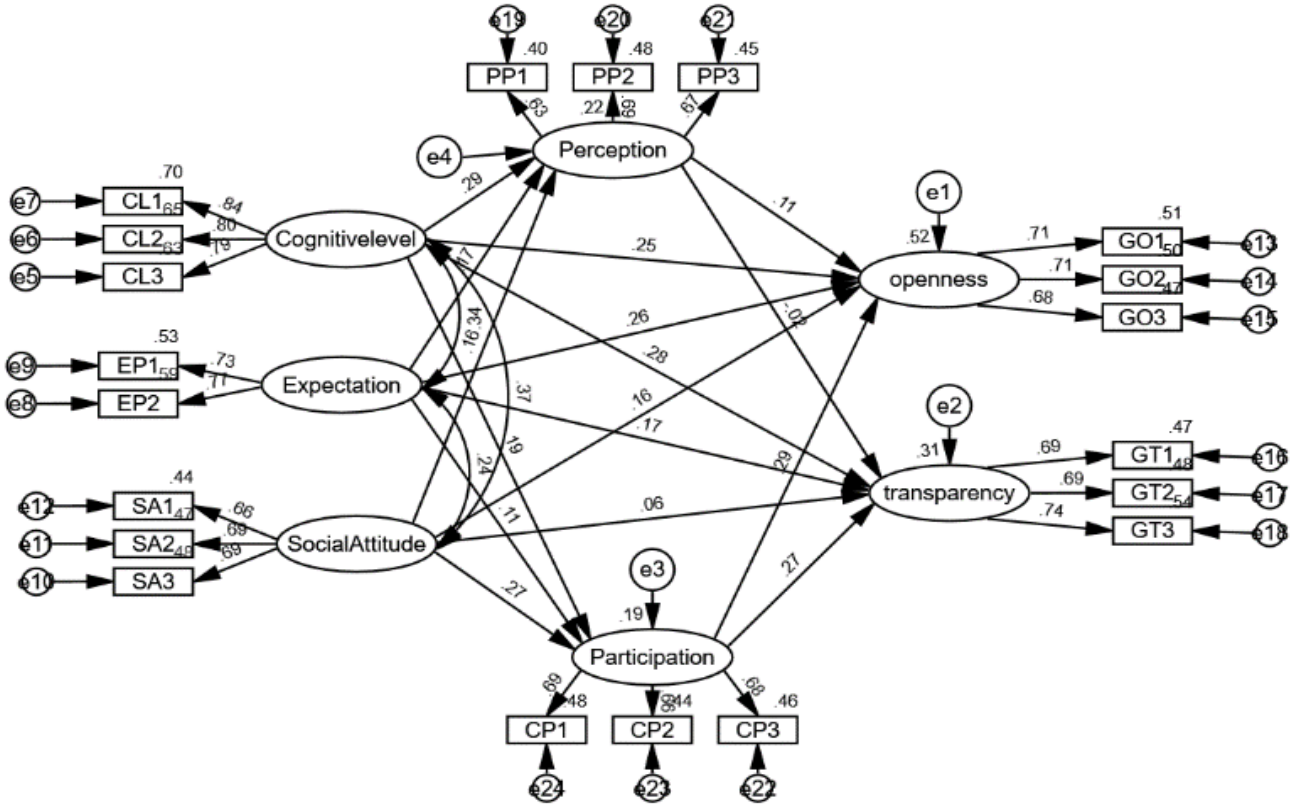

Fig. 2 Initial structural equation model (initial model) (The author's elaboration)

All the estimated coefficients of each variable and the corresponding first-order factor are significant (ranging from 0.634 to 0.838). However, all AVEs are greater than 0.5 and CRs are greater than 0.7, indicating that there is a significant impact. Thus, it is possible to make further adjustments.

4.2.3. Path Analysis

Furthermore, this research uses path analysis to explore whether the data can fully fit or not. The output from SPSS 21.0 is summarized in Figure 3.

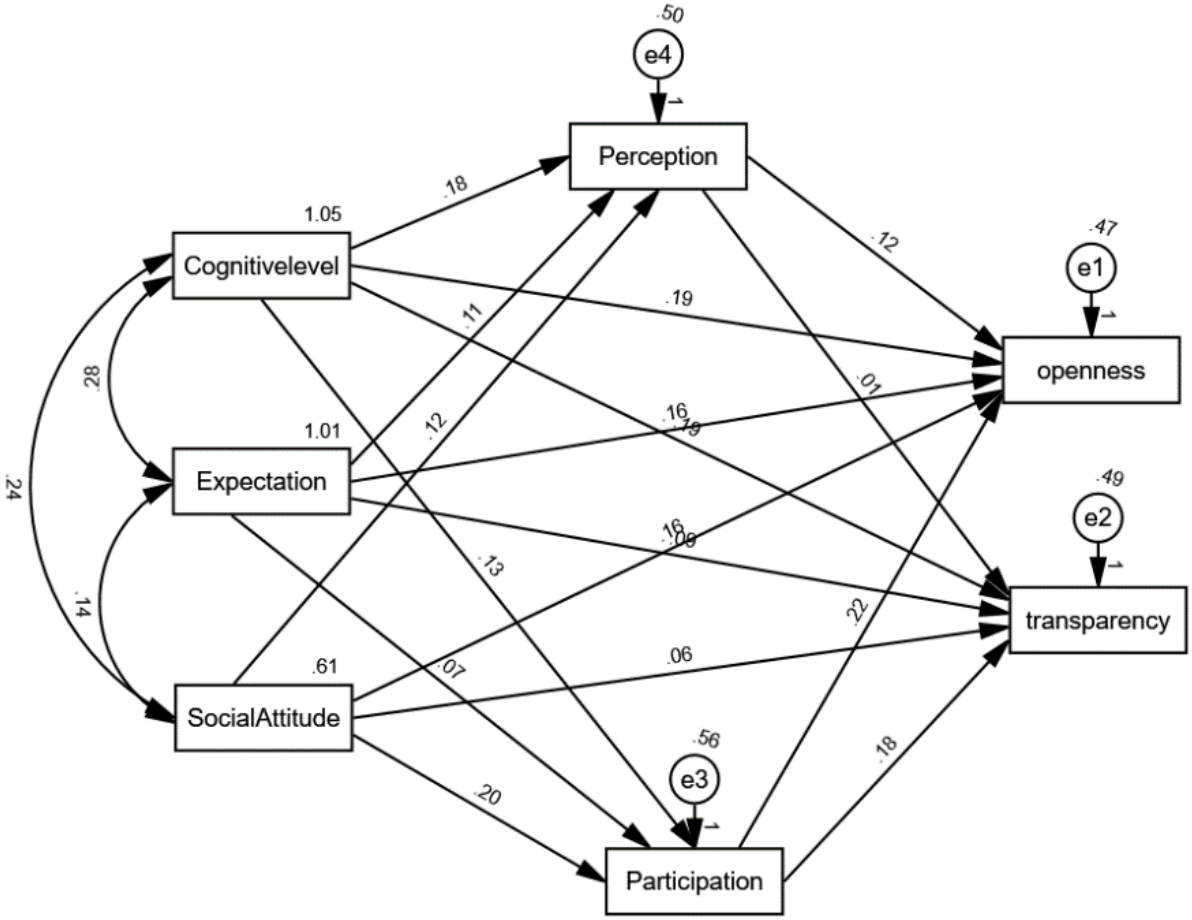

Fig. 3 Results of path analysis (The author's elaboration)

According to the above results of the path analysis, the coefficients of each path are all positive, indicating a positive impact relationship between variables. However, from the perspective of coefficients (ranging from 0.007 to 0.247), the impact of each path is not significant.

4.2.4. Analysis of the Adjustment Effect

As for the adjustment effect of the model. the adjustment effects of four groups of adjustment models were analyzed.

The process of policy perception impacts government openness:

In the first adjustment model, this research verifies the adjustment role of individual participation when policy perceptions impact government openness. Therefore, the first model is proposed with government openness as the dependent variable, policy perception as the independent variable, and individual participation as the adjustment variable. The output from SPSS 21.0 is summarized in Tables 7 and Table 8.

Table 7 Summary of the model (Adjustment Model 1) (The author's elaboration)

	R	R-sq	MSE	F	df1	df2	p
Model 1	0.4739	0.2246	0.5371	34.9573	3.0000	362.0000	0.0000

From the summary table of the first model, it can be said that the model fitting is acceptable.

Table 8 Coefficient of the model (Adjustment Model 1) (The author's elaboration)

	Coefficient	S. E.	t	P	LLCI	ULCI
Constant	3.7686	0.0390	96.5778	0.0000	3.6919	3.8454
PP	0.2615	0.0529	4.9456	0.0000	0.1575	0.3654
Int_1	0.0935	0.0544	1.7183	0.0866	-0.0135	0.2006

From the results of the coefficients in adjustment model 1, it is seen that the interaction term of the independent variable and the regulating variable does not have a significant impact on the dependent variable ($p = 0.0866 > 0.05$), and the upper and lower limits of the corresponding 95% confidence interval (-0135, 0.2006) include 0, indicating that the interaction term is not significant. This result shows that the adjustment effect of individual participation under the impact of policy perception on government openness is not

significant.

In the second adjustment model, this research aims to verify the adjustment role of government tolerance when policy perception impacts government openness. Therefore, the second model is proposed with government openness as the dependent variable, policy perception as the independent variable, and government tolerance as the adjustment variable. The output from SPSS 21.0 is summarized in Tables 9 and 10.

Table 9 Summary of the model (Adjustment Model 2) (The author's elaboration)

	R	R-sq	MSE	F	df1	df2	p
Model 2	0.4145	0.1718	0.5736	25.0352	3.0000	362.0000	0.0000

From the summary table of the second model, it can be said that the model fitting is acceptable.

Table 10 Coefficient of the model (Adjustment Model 2) (The author's elaboration)

	Coefficient	S. E.	t	P	LLCI	ULCI
Constant	3.7855	0.0402	94.2721	0.0000	3.7065	3.8645
PP	0.2751	0.0537	5.1246	0.0000	0.1695	0.3807
Int_1	0.0336	0.0552	0.6082	0.5434	-0.0750	0.1422

From the results of coefficients in adjustment model 2, it is seen that the interaction term of the independent variable and adjustment variable does not have a significant impact on the dependent variable ($p = 0.5434 > 0.05$), and the upper and lower limits of the corresponding 95% confidence interval (-0750, 0.1422) include 0, indicating that the interaction term is not significant. This result shows that the adjustment effect of government tolerance under the impact of policy perception on government openness is not significant.

The process of citizen participation affects government transparency:

In the third adjustment model, this research aims to verify the adjustment role of individual participation when citizen participation impacts government transparency. Therefore, the third model is proposed with government transparency as the dependent variable, citizen participation as the independent variable, and individual participation as the adjustment variable. The output from SPSS 21.0 is summarized in Tables 11 and 12.

Table 11 Summary of the model (Adjustment Model 3) (The author's elaboration)

	R	R-sq	MSE	F	df1	df2	p
Model 3	0.3890	0.1513	0.5118	21.5158	3.0000	362.0000	0.0000

From the summary table of the third model, it can be said that the model fitting is acceptable.

Table 12 Coefficient of the model (Adjustment Model 3) (The author's elaboration)

	Coefficient	S. E.	t	P	LLCI	ULCI
Constant	4.0876	0.0386	105.8825	0.0000	4.0117	4.1635
PP	0.1821	0.0503	3.6210	0.0003	0.0832	0.2809
Int_1	-0.0919	0.0504	-1.8222	0.0693	-0.1910	0.0073

From the results of coefficients in adjustment model 3, it is seen that the interaction term of the independent variable and adjustment variable does not have a significant impact on the dependent variable ($p = 0.0693 > 0.05$), and the upper and lower limits of the corresponding 95% confidence interval (-0. 1910, 0. 0073) include 0, indicating that the interaction term is not significant. This result shows that the adjustment effect of individual participation under the impact of citizen participation on government transparency is not significant.

In the fourth adjustment model, this research aims to verify the adjustment role of government tolerance when citizen participation impacts government transparency. Therefore, the third model is proposed with government transparency as the dependent variable, citizen participation as the independent variable, and government tolerance as the adjustment variable. The output from SPSS 21.0 is summarized in Tables 13 and 14.

Table 13 Summary of the model (Adjustment Model 4) (The author's elaboration)

	R	R-sq	MSE	F	df1	df2	p
Model 4	0.3646	0.1330	0.5229	18.5037	3.0000	362.0000	0.0000

From the summary table of the fourth model, it can be said that the model fitting is acceptable.

Table 14 Coefficient of the model (Adjustment Model 4) (The author's elaboration)

	Coefficient	S. E.	t	P	LLCI	ULCI
Constant	4.1012	0.0393	104.2750	0.0000	4.0238	4.1785

Continuation of Table 14

PP	0.1803	0.0519	3.4728	0.0006	0.0782	0.2824
Int_1	0.1295	0.0454	2.8542	0.0046	0.0403	0.2187

From the results of coefficients in adjustment model 4, it is seen that the interaction term of the independent variable and adjustment variable has a significant impact on the dependent variable ($p = 0.0046 < 0.05$), and the upper and lower limits of the corresponding 95% confidence interval (0. 0403, 0. 2187) do not include 0, indicating that the interaction term is significant. This shows that the adjustment effect of government tolerance under the impact of citizen participation on government transparency is significant.

Until now, it had been verified that only the adjustment effect of government tolerance under the impact of citizen participation on government transparency is significant. Thus, this research draws the slope plot through M ± 1SD to make the further verification. The output from SPSS 21.0 is shown in Figure 4.

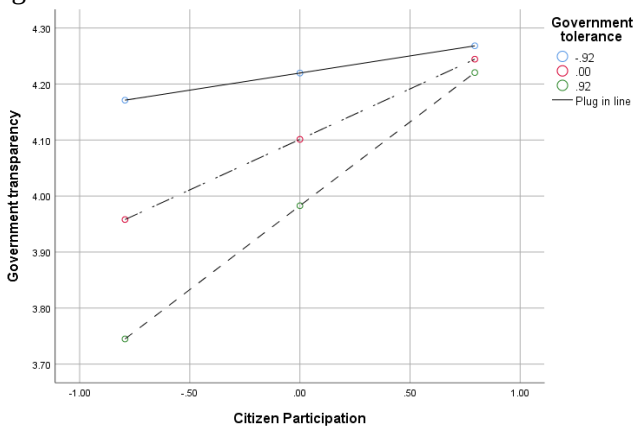

Fig. 4 Slope plot of M ± 1SD (The author's elaboration)

It could be found that due to the existence of an adjustment effect, the slope of regression is different when the adjustment variables are at different levels. In other words, the adjustment variable has different influences on the dependent variable at different levels.

4.2.5. Modified Structural Equation Model

On the basis of the initial SEM and the above path analysis, this research makes some further modifications to the structural equation model. According to AMOS's revised opinion (covariance guidance modification in modification indices), the following modifications are required.

First, the errors of two dependent variables, government openness and transparency, are e1 and e2, thus, it is logical to connect these two errors e1 and e2.

Second, the error of policy perception is e4, and the error of the first question (the individual's attention to social hot spots) is e7.

Third, policy perception is taken as the mediatory variable, whereas government openness and transparency are taken as the dependent variables. The first question (the individual's attention to social hot spots) is closely related to the mediatory variable (policy perception) and the dependent variable (government openness and government transparency), so it is reasonable to link the errors between them.

The results of the modified research are calculated with the help of SPSS 21.0, which is summarized in Tables 15-17, and Figure 5.

Table 15 Overall fitting index of the model (modified model) (The author's elaboration)

Statistical test quantity	**Threshold of adaptation**	**Results of the inspection**	**Judgment of fit**
Chi-square value (CMIN)		149.901	Supporting
Chi-square degree of freedom (CMIN/DF)	< 3, not strictly less than 5 (or even 8)	1.02	Supporting
Goodness of fit index (GFI)	> 0.90, close to 0.9 is generally acceptable	0.962	Supporting
Adjusted goodness of fit index (AGFI)	> 0.90, close to 0.9 is generally acceptable	0.946	Supporting
Root mean square error (RMR)	< 0.05, not strictly less than 0.1	0.035	Supporting
Normalized root mean square error (SRMR)	< 0.05, not strictly less than 0.1	0.0333	Supporting
Approximate error mean square sum (RMSEA)	< 0.05 (good adaptation) < 0.08 (reasonable	0.007	Supporting
Gauge fit index (NFI)	> 0.90, close to 0.9 is generally acceptable	0.935	Supporting
Value added fit index (IFI)	> 0.90, close to 0.9 is generally acceptable	0.999	Supporting
Tucker-Lewis index (TLI)	> 0.90, close to 0.9 is generally acceptable	0.998	Supporting
Compare fitting index (CFI)	> 0.90, close to 0.9 is generally acceptable	0.999	Supporting

Table 16 Summary of model parameter estimates (modified model) (The author's elaboration)

	S.E.	**C.R.**	**P**	**S. E.**	**Conclusion**
Perception ← Cognitive level	0.057	3.149	0.002	0.256	Supporting Conclusion
Perception ← Expectation	0.057	2.343	0.019	0.183	Supporting Conclusion
Participation ← Social Attitude	0.082	3.389	***	0.276	Supporting Conclusion

Continuation of Table 16					
Participation ← Cognitive level	0.052	2.447	0.014	0.186	Supporting Conclusion
Participation ← Expectation	0.055	1.521	0.128	0.116	Rejecting Conclusion
Perception ← Social Attitude	0.081	2.238	0.025	0.176	Supporting Conclusion
Openness ← Perception	0.084	1.969	0.049	0.144	Supporting Conclusion
Openness ← Cognitive level	0.059	2.355	0.019	0.173	Supporting Conclusion
Transparency ← Cognitive level	0.059	3.825	***	0.313	Supporting Conclusion
Transparency ← Participation	0.082	3.046	0.002	0.241	Supporting Conclusion
Openness ← Expectation	0.061	3.572	***	0.258	Supporting Conclusion
Transparency ← Expectation	0.056	1.825	0.068	0.138	Supporting Conclusion
Openness ← Social Attitude	0.087	2.488	0.013	0.183	Supporting Conclusion
Transparency ← Social Attitude	0.083	0.577	0.564	0.046	Rejecting Conclusion
Openness ← Participation	0.086	3.749	***	0.273	Supporting Conclusion
Transparency ← Perception	0.079	-0.195	0.845	-0.015	Rejecting Conclusion
CL3 ← Cognitive level				0.803	Supporting Conclusion
CL2 ← Cognitive level	0.066	15.635	***	0.807	Supporting Conclusion
CL1 ← Cognitive level	0.069	15.714	***	0.828	Supporting Conclusion
EP2 ← Expectation				0.77	Supporting Conclusion
EP1 ← Expectation	0.133	7.132	***	0.733	Supporting Conclusion
SA3 ← Social Attitude				0.689	Supporting Conclusion
SA2 ← Social Attitude	0.115	9.266	***	0.687	Supporting Conclusion
SA1 ← Social Attitude	0.12	9.166	***	0.664	Supporting Conclusion
GO1 ← openness				0.708	Supporting Conclusion
GO2 ← openness	0.088	11.088	***	0.711	Supporting Conclusion
GO3 ← openness	0.085	10.814	***	0.686	Supporting Conclusion
GT1 ← transparency				0.684	Supporting Conclusion
GT2 ← transparency	0.101	10.23	***	0.704	Supporting Conclusion
GT3 ← transparency	0.099	10.37	***	0.728	Supporting Conclusion
PP1 ← Perception				0.635	Supporting Conclusion
PP2 ← Perception	0.116	8.663	***	0.691	Supporting Conclusion
PP3 ← Perception	0.112	8.629	***	0.676	Supporting Conclusion
CP3 ← Participation				0.669	Supporting Conclusion
CP2 ← Participation	0.112	9.155	***	0.676	Supporting Conclusion
CP1 ← Participation	0.128	9.22	***	0.693	Supporting Conclusion

Table 17 Validity of the model (modified model) (The author's elaboration)

Route	**Estimate**	**SMC R2**	**Measuring error**	**CR**	**AVE**
CL3 ← Cognitive level	0.803	0.644809	0.355191	0.8537	0.6605
CL2 ← Cognitive level	0.807	0.651249	0.348751		
CL1 ← Cognitive level	0.828	0.685584	0.314416		
EP2 ← Expectation	0.77	0.5929	0.4071	0.722	0.5651
EP1 ← Expectation	0.733	0.537289	0.462711		
SA3 ← Social Attitude	0.689	0.474721	0.525279	0.7207	0.5125
SA2 ← Social Attitude	0.687	0.471969	0.528031		
SA1 ← Social Attitude	0.664	0.440896	0.559104		
GO1 ← openness	0.708	0.501264	0.498736	0.7443	0.5225
GO2 ← openness	0.711	0.505521	0.494479		
GO3 ← openness	0.686	0.470596	0.529404		
GT1 ← transparency	0.684	0.467856	0.532144	0.7482	0.5379
GT2 ← transparency	0.704	0.495616	0.504384		
GT3 ← transparency	0.728	0.529984	0.470016		
PP1 ← Perception	0.635	0.403225	0.596775	0.7068	0.5059
PP2 ← Perception	0.691	0.477481	0.522519		
PP3 ← Perception	0.676	0.456976	0.543024		
CP3 ← Participation	0.669	0.447561	0.552439	0.72	0.5116
CP2 ← Participation	0.676	0.456976	0.543024		
CP1 ← Participation	0.693	0.480249	0.519751		

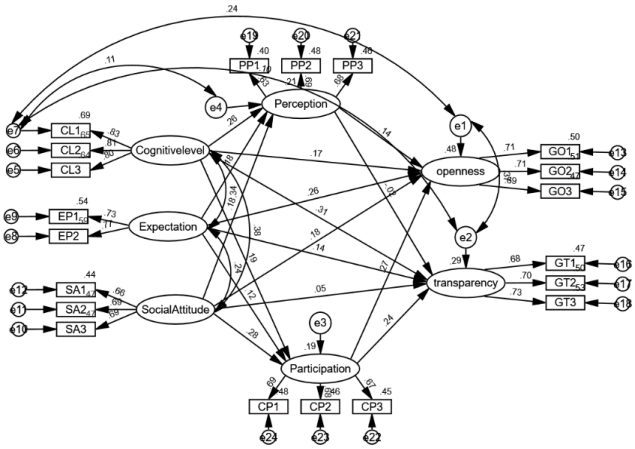

Fig. 5 Modified structural equation model (modified model) (The author's elaboration)

As for the model fitting results, all fitting parameters meet the requirements, indicating that the modified model fits quite well. In other words, the theoretical assumptions are consistent with the real data. Furthermore, as for the estimated coefficients of each variable and the corresponding first-order factor, all estimates range from 0.635 to 0.828, conforming to the acceptable range (0.50-0.95), indicating very significant effects.

4.2.6. Analysis of the Moderating Effect

To determine the mediation role of policy perception and citizen participation (moderation variables) in the impact of cognitive level, expectation perception, and social attitude (independent variables) on government openness and transparency (dependent variables), this research completes the analysis of the moderating effect. The output from SPSS 21.0 is summarized in Tables 18 and 19.

Table 18 Standardized indirect effects - lower bounds (BC) (The author's elaboration)

	Social Attitude	Expectation	Cognitive level
Participation	0	0	0
Perception	0	0	0
Transparency	0.005	-0.03	-0.021
Openness	0.037	-0.002	0.027

Table 19 Standardized indirect effects - upper bounds (BC) (The author's elaboration)

	Social Attitude	Expectation	Cognitive level
Participation	0	0	0
Perception	0	0	0
Transparency	0.154	0.092	0.124
Openness	0.195	0.14	0.173

As for the impact of cognitive level on government transparency, by observing the upper and lower limits of the confidence interval with bias correction, the lower and upper limits of the indirect effect of the independent variable cognitive level on the dependent variable government transparency are -0.021 and 0.124. Therefore, the confidence interval includes 0. From this viewpoint, the mediating effect of mediating variables (policy perception and citizen participation) in the process of independent variable cognitive level making impacts on dependent variable government transparency is not significant.

As for the impact of cognitive level on government openness, by observing the upper and lower limits of the confidence interval with bias correction, the lower and upper limits of the indirect effect of the independent variable cognitive level on the dependent variable government openness are 0.027 and 0.173. Therefore, the confidence interval does not include 0. From this viewpoint, the mediating effect of mediating variables (policy perception and citizen participation) in the process of independent variable cognitive level making impacts on dependent variable government openness is significant.

As for the impact of expectation on government transparency, by observing the upper and lower limits of the confidence interval with bias correction, the lower and upper limits of the indirect effect of the independent variable cognitive level on the dependent variable government transparency are -0.03 and 0.092. Therefore, the confidence interval includes 0. From this viewpoint, the mediating effect of mediating variables (policy perception and citizen participation) in the process of independent variable expectation making impacts on dependent variable government transparency is not significant.

As for the impact of expectation on government openness, by observing the upper and lower limits of the confidence interval with bias correction, the lower and upper limits of the indirect effect of the independent variable cognitive level on the dependent variable government openness are -0.002 and 0.14. Therefore, the confidence interval includes 0. From this viewpoint, the mediating effect of mediating variables (policy perception and citizen participation) in the process of independent variable expectation making impacts on dependent variable government openness is not significant.

As for the impact of social attitude on government transparency, by observing the upper and lower limits of the confidence interval with bias correction, the lower and upper limits of the indirect effect of the independent variable cognitive level on the dependent variable government transparency are 0.005 and 0.154. Therefore, the confidence interval excludes 0. From this viewpoint, the mediating effect of mediating variables (policy perception and citizen participation) in the process of independent variable social attitude making impacts on dependent variable government transparency is significant.

As for the impact of social attitude on government openness, by observing the upper and lower limits of the confidence interval with bias correction, the lower and upper limits of the indirect effect of the independent variable cognitive level on the dependent variable government transparency are 0.0037 and

0.195. Therefore, the confidence interval excludes 0. From this viewpoint, the mediating effect of mediating variables (policy perception and citizen participation) in the process of independent variable social attitude making impacts on dependent variable government openness is significant.

To date, this research has discussed the impact of cognitive level, expectation, and social attitude (independent variables) on government openness and transparency (dependent variables) by considering the intermediary role of policy perception and citizen participation (moderation variables) through a series of empirical analyzes. Based on the findings of the empirical analysis, it is possible to make a judgment on the hypothesis proposed above, which is summarized in Table 20.

Table 20 Verification of the hypotheses (The author's elaboration)

Hypothesis	**Conclusions**
H1a: Cognitive level has positive impacts on government openness.	Supported
H1b: Cognitive level has positive impacts on government transparency.	Supported
H2a: Expectations have positive impacts on government openness.	Supported
H2b: Expectations have positive impacts on government transparency.	Supported
H3a: Social attitudes have positive impacts on government openness.	Supported
H3b: Social attitudes have positive impacts on government transparency.	Not supported
H4a: Policy perception plays a mediatory role in the impact of cognitive level on government openness.	Supported
H4b: Policy perception plays a mediatory role in the impact of transparency on government transparency.	Not supported
H4c: Policy perception plays a mediatory role in the impact of expectations on government openness.	Not supported
H4d: Policy perception plays a mediatory role in the impact of expectations on government transparency.	Not supported
H4e: Policy perception plays a mediatory role in the impact of social attitudes on government openness.	Supported
H4f: Policy perception plays a mediatory role in the impact of social attitudes on government transparency.	Supported
H5a: Citizen participation plays a mediatory role in the impact of cognitive level on government openness.	Supported
H5b: Citizen participation plays a mediatory role in the impact of transparency on government transparency.	Not supported
H5c: Citizen participation plays a mediatory role in the impact of expectation on government openness.	Not supported
H5d: Citizen participation plays a mediatory role in the impact of expectations on government transparency.	Not supported
H5e: Citizen participation plays a mediatory role in the impact of social attitudes on government openness.	Supported
H5f: Citizen participation plays a mediatory role in the impact of social attitudes on government transparency.	Supported

5. Conclusion

To better seize opportunities and respond to challenges, this research focuses on the issue of citizens' participation in public policy in the online environment. According to the results of the empirical analysis, citizens' cognitive level, individual expectation, and social attitude would all impact government openness and transparency, and thus the effectiveness and efficiency of citizens' online participation in policy formulation. Furthermore, it seems that policy perception and citizen participation played a mediating role to some extent in the increase in government openness and transparency. Therefore, more efforts should be put into promoting citizens' cognitive level, individual expectation, and social attitude. Undoubtedly, the mediating role of policy perception and citizen participation should not be ignored.

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