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Can Government Communication Facilitate Policy Understanding Toward Energy Conservation? Evidence from an Old Industrial Base in China

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Abstract: Policy understanding toward energy conservation is fundamental for voluntary energy-saving activities in the industrial sector. To increase policy understanding, government communication has been regarded as a means of helping enterprises to recognize, learn, and interpret energy conservation policies. This article builds up a conceptual framework for government communication and policy understanding. In the conceptual framework, the authors distinguish three dimensions (prior consultation, policy marketing, and policy training) of government communication, and make a distinction between subjective and objective policy understanding. The role of government communication in facilitating policy understanding is empirically tested in the field of energy-saving in China. The article finds that prior consultation and policy training have significant positive influence on policy understanding, and the effect of policy training is slightly larger than that of prior consultation. However, policy marketing does not show any significant impact on policy understanding. In particular, the role of prior consultation lies in promoting subjective policy understanding, while the function of policy training is to improve objective policy understanding. These findings have important implications for the government to carry out energy conservation. The article ends up with some practical policy recommendations.

Keywords: government communication; policy understanding; energy conservation; Liaoning; China

1. Introduction

Since 1978, China's economy has been developing at an unprecedented speed. The annual growth rate of GDP has been kept at 10% for three decades. However, the economic growth is achieved at the expense of consuming excessive energy resources and discharging a great amount of carbon emissions [1]. To reverse this unsustainable development trend, China started to formulate concrete energy conservation regulations and policies since 2003, when the Hu Jintao government made much of its commitment to sustainable and scientific development and considered energy consumption and environmental loss into national economic accounting [2,3]. In the 11th (2006–2010) national five-year social and economic development plan (FYP), the main policy measure was the Top 1000 Energy-Intensive Enterprise Action Program [4]. Afterwards, in the 12th (2011–2015) FYP, another major policy was put forward; that is the Energy-Saving and Low Carbon Action of 10,000 Enterprises [5,6].

The selected enterprises in both action programs are State-Owned Enterprises (SOEs) that are mandated to reduce the energy intensity and increase energy efficiency during production processes. The action programs were implemented through the Target Responsibility System (TRS) [7]. Under the

TRS, responsibility contracts are signed at two different levels. The first level contract is signed between the national government and the provincial governments. The national government judges the natural and socioeconomic situations of the provinces and accordingly divide and allocate the energy-saving target to individual provinces. The second level contract is signed between the provincial governments and the selected SOEs within their jurisdictions. Both provincial governments and the SOEs will be panelized if the energy-saving target is not accomplished. The selected SOEs agreed to sign contracts with provincial governments because their leaders are appointed by government and they perform dual functions of enterprise manager and government personnel [8].

In 2016, the Ministry of Industry and Information Technology (MoIIT) enacted a general Industrial Energy Conservation Policy (IECP), which explicitly states two updated national goals of energy conservation [9]. First, not only SOEs but also private enterprises should build up energy-saving management systems and implement energy-saving techniques in production processes. Second, not only heavy industrial enterprises, but also light industrial and service enterprises need to conduct energy saving activities. This put new challenges on energy conservation in China, because the mandated responsibility contracts would not work with massive and ever increasing private enterprises. Also, the large SOEs whose leaders play dual roles of enterprise and government have direct communication with provincial governments concerning the details of the energy-saving policies. In contrast, the private enterprises have few opportunities and low incentives to access policy information on energy conservation.

Consequently, it is highly possible that the private enterprises lack an understanding of what the energy conservation policy is about, how the policy benefits their enterprises and the society at large, and how to adopt energy-saving techniques in practical production processes. According to Porumbescu et al.: "a lack of [policy] understanding is problematic because it can result in a low level of voluntary policy compliance" [10,11]. In this sense, the uninformed private enterprises may hinder the effective implementation of the energy conservation policy intentionally or unintentionally.

When considering this problem, in extant literature government communication has been regarded as a way of ensuring policy target group to understand policy contents, eventually fostering a high level of policy compliance and policy support [11,12]. This is because more frequent, improved government communication efforts can strengthen relationships between the target group and the government and empowers the target group to understand what the government is doing and why [13].

Therefore, this article examines to what extent the provincial governments in China carry out government communication concerning the IECP; to what extent the private enterprises understand the IEPC; and, to what extent government communication facilitates policy understanding toward the IECP, using survey data obtained from some 295 private enterprises in Liaoning province, which is an old industrial base in China.

The article is structured as follows. Section 2 builds up a conceptual framework for government communication and policy understanding. Section 3 reports the methods, data collection and processing, and operationalization of the conceptual framework. Section 4 tests the conceptual framework and presents the survey results. Section 5 displays and explains the main findings from the survey. Section 6 concludes, discusses research limitations, and proposes some future research agenda.

2. Conceptual Framework

2.1. Government Communication

Communication is a kind of organizational behavior to convey information between the various internal and external stakeholders and thus help organizations to achieve their goals. In government organizations, Howlett [14,15] suggests that: "communication is an instrument to assist government to reach policy goals and maintain mutually beneficial relationships between government and the various publics on whom policy success or failure depends". Therefore, government communication

is a process of providing or withholding information or knowledge-based resources from policy target group to influence and direct their attitudes and actions regarding the policy [16].

Scholarly attention on government communication is few in the field of policy making and implementation [13]. As Ho and Cho [17] put it: "because of legal restrictions, political pressures or fiscal constraints, many governments prefer to invest their limited resources in service delivery rather than [government] communication". As a result, scholars paid less attention on government communication. Studies on communication in the public sector tend to focus on internal organizational concerns [18,19] or on the communication mechanisms between multiple governmental organizations in disaster or crisis management situations [20,21]. Few empirical researches have explored the impacts and value-added benefits of government communication with policy target group that are critical for achieving policy goals.

Nevertheless, a few scholars have formulated some government communication activities with the target group that can affect policy performance [14]. In general, two types of government communication activities can be distinguished. The first type concentrates on communication activities before policy implementation, including the stages of policy design and policy release. The function of this type of communication lies in better designing the policy by incorporating the practical situations of the target group and giving more useful information and assistance to the target group to help them understand the policy before implementation. The second type deals with government communication activities after policy implementation. The purpose is to collect feedback data on policy performance, conduct policy evaluation, and thus promote policy learning and adaptation. In this article, our aim is to explore the effectiveness of government communication on policy understanding of the target group, so we focus on the first type of communication, i.e., government communication activities before policy implementation.

In this regard, we formulate three categories of government communication activities before policy implementation. The first category is "prior consultation", which refers to opinion communication to gather attitudes, perceptions, judgements, feelings, ideas, and situations of the target group on a proposed government initiative [22]. These attitudes, perceptions, and situations are important, early evidence for policy-makers to understand problem situations of the target group and formulate more rational, understandable solutions [23–26]. Policy-makers design and formulate proposals that are then considered for adoption on certain target groups. Policy-makers' preferences often differ from those of target groups (not necessarily that they are at odds) [27]. This is especially true in our case. Decision-makers of energy conservation policy are at various levels of governments, which have goals of achieving energy-saving targets that are imposed by higher authority. Industrial enterprises as the target group have goals of maximizing profits by lowing production costs; and, the renewal of less energy efficient production processes necessities extra operational and administrative costs. In this situation, the government is better to consult the enterprises via the use of meetings, phone calls, and emails about the enterprises' situations of energy usage, willingness of energy-saving, and potential difficulties of adopting energy-saving policies. Therefore, this prior consultation is critically helpful for the government to recognize/diagnose the practical situations of the policy issue and to make the policy more evidence-based, inclusive, and easier to understand. At the enterprise side, prior consultation may enable the enterprises to know beforehand what the government is planning. This will facilitate the enterprises' policy understanding when the policy is released.

The second category is "policy marketing". According to Menon and Menon [28]: "marketing in business management refers to activities and processes of creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners and society at large". In government communication, policy marketing means the activities, strategies, and processes of promoting governments' policy initiatives, programs, and services to the public or certain target groups in support of government policies [29]. There are a variety of concrete policy marketing activities. For instance, governments may organize public events to inform the public or certain target groups about significant government initiatives or programs. Governments may also use strategies

of publishing or spokesmanship for policy marketing [22]. The former refers to governments that are producing information materials associated with policy initiatives for mass distribution; the later refers to the presentation and explanation of policy initiatives to the public or certain target groups by designated communication personnel. In addition, policy marketing is usually combined with policy advertising [30]. That is, governments may use media channels to send persuasive messages to the public. The purpose of policy advertising is to increase public awareness of the existence of government policies and to advocate the benefits of the policies. Scholars have demonstrated that persuasive messages sent through media channels have a strong role in forming and changing public attitudes toward a policy [31,32].

The third category is "policy training". Kroll and Moynihan [33] in their research on the impact of training on organizational performance state that: "training is a default solution to all manner of managerial challenges ranging from ethical problems and rule violations to employees acquiring skills". Given the assumption that "individual preferences and capacities are mutable and subject to external influence" [34], the role of training lies in: "communicating organizational norms and new ideas and reinforcing organizational culture" [35]. In the public sector, researches on training are associated with reform implementation or the adoption of new policies [35]. If we acknowledge that new policy adoption will bring about administrative or procedural changes in organizations, we can use theories of organizational change to demonstrate the fact that acceptance of change (e.g., adopting a new policy) requires learning new technologies and skills, and building up new standard operating procedures, routines, and administrative systems. In light of this, the government must facilitate and help the target group to overcome practical difficulties and obstacles during policy implementation, and address specific doubts and concerns with organizational and technical changes [35]. This suggests that training is important because implementing reforms and new policies require the target group to face new tasks or ways of behaving. For instance, during training the target group may express to the government concerning the problems and difficulties with adopting the new policy, while the government may persuade the target group by presenting the policy's potential benefits. More importantly, training can also improve the target group's technical and management capacities to achieve the mandated actions and changes [36]. After obtaining necessary skills and expertise, the target group can reduce their uncertain feeling and fear about the new policy, and thus understand, accept, and feel comfortable with the managerial and technical changes [33].

2.2. Policy Understanding

Understanding is a cognitive process by which people are able to think about an object, give an explanation of its structure, qualities, and features. Policy understanding is thus a cognitive process related to a policy whereby "one can consciously reproduce the information content conveyed by the policy", such as the policy's goals, contents, rules, and more importantly, "what one needs to do in order to comply with the policy" [11,12].

Policy understanding can be interpreted by two dimensions, objective understanding and subjective understanding [37]. Based on the definition that was provided by Porumbescu et al. [12], objective understanding means that the policy target group "objectively understand the benefits of a policy, the need for the policy, its associated costs and the procedures (things to do) of implementing the policy". If the target group has objective understanding of a policy, they are believed to generate rational/proper behavior and know how to act on it [38]. Subjective understanding is also called perceived understanding, which means that the target group has a sense of self-efficacy to act upon the policy. That being said, subjective understanding measures the target group's belief about to what extent they are able to perform on the policy. Thus, subjective understanding constitutes a motivational basis for voluntary policy compliance [39].

Objective understanding and subjective understanding are interrelated to yield the overall policy understanding. Objective understanding is important, but there will be no actions upon the policy if the target group does not believe they are able to, or they have the capacity to act on the policy. Therefore,

a better subjective understanding is also important because it can help to translate an objective understanding into concrete actions upon the policy. Accordingly, the overall policy understanding is an outcome of the interactive process between subjective and objective policy understanding, and it can tell the general level of policy understanding of the policy target.

3. Materials and Methods

3.1. Structure of Questionnaire and Pilot Study

According to our conceptual framework, government communication was measured according to the three dimensions: prior consultation, policy marketing, and policy training. The three dimensions are measured in a reflective manner, which means that each item is designed to reflect a different dimension of the relevant construct. The five-point Likert scale ranging from "1 (strongly disagree)" to "5 (strongly disagree)" is applied to measure answers' judgment to expression of the item.

Regarding prior consultation, the public consultation literature [40–43], as well as the debates in the field of more "evidence-informed" policy making [25,44], indicate that prior consultation should focus on collecting early information on the target group's status-quo on the policy issue and its willingness and potential difficulties to implement the policy. Hence, in the questionnaire we use three questions dealing with the frequency of information collection on the status-quo of the policy issue, the willingness and the potential difficulties to implement the policy to examine the level of prior consultation.

The level of policy marketing is also measured by three questions. The literature on government information disclosure and provision [45] and policy propaganda [46] suggests that, in order to increase the effectiveness of information provision for a potential policy, government may take actions to organize public events to inform the target group about the existence of a policy and to visit the target group to explain the benefits of the policy. Therefore, in the questionnaire, we use three questions regarding the presence and frequency of government efforts to inform a policy and to explain its benefits to measure the degree of policy marketing.

Concerning policy training, the literature on reform implementation and organizational change [33–35] reveals that technical training does matter on management reforms, and it is also true for successful production process changes and management system reforms. Here, it is important for the government to help the enterprises with technical difficulties. The government may do three things to reduce the policy's technical complexities. First, the government may explain the technical terminologies in the policy document to the enterprises. Second, the government may send special experts to the enterprises to conduct technical training. Third, the government may also invite professionals to the enterprises to guide the daily operation of the policy. In the questionnaire, we use these three aspects to measure the degree of government efforts to conduct policy training.

Policy understanding is measured in three dimensions, including objective understanding, subjective understanding, and overall policy understanding. To measure objective understanding, respondents are asked to answer three questions about a particular issue or information based on their interpretation of IECP. Then we calculate the total score (0–10 points) of three questions, and higher score reflects their greater objective understanding of the policy. To measure subjective understanding, the respondents are asked to answer two questions that reflect their self-efficacy of policy understanding. The first question is: "To what extent you may understand the procedures and requirements for implementing IECP?" The second question is: "If ask you 5 general questions about IECP, how many do you think you may answer correctly?" Finally, the overall policy understanding is measured by the sum of objective understanding and subjective understanding.

Survey questions of the independent and dependent variables are summarized in Table 1.

Table 1. Operationalization of conceptual framework and a summary of survey questions.

Variables	Dimensions	Abb.	Measurement items	Item abbr.
Independent variable	Prior consultation	PC	(1) The local government official often consults me concerning the status quo of energy usage of my enterprise.	A1
			(2) The local government official often consults me concerning the willingness of my enterprise to carry out energy-saving.	A2
			(3) The local government official often consults me concerning the potential difficulties of my enterprise to carry out energy-saving.	A3
	Policy marketing	PM	(1) I have been often invited to participate in promoting or mobilizing activities for IECP organized by the local government.	A4
			(2) I often receive propaganda materials like brochures and advertising videos on IECP.	A5
			(3) The local government official often visits my enterprise to explain the benefits of implementing IECP.	A6
	Policy training	PT	(1) The local government official often explains to me about the technical terminologies in IECP.	A7
			(2) The local government often sends special experts to my enterprise to conduct technical training about IECP.	A8
			(3) The local government often invites professionals to guide us how to implement IECP in our daily operation.	A9
Dependent variable	Objective understanding	OU	(1) What are the goals of IECP?	B1
			(2) What are the main contents of IECP?	B2
			(3) What are the benefits that enterprises may obtain from implementing IECP?	B3
	Subjective Understanding	SU	(1) To what extent you may understand the procedures and requirements for implementing IECP?	B4
			(2) If ask you 5 general questions about IECP, how many do you think you may answer correctly?	B5
	Policy Understanding	PU	(1) Sum of OU and SU.	B6

In addition to consulting existing literatures, the self-developed questionnaire was subjected to expert evaluation and a pilot study to check any ambiguity and difficulty in wording, and thus necessary modifications can be made. Firstly, we invited six experts to review and evaluation our questionnaire. Two of them are from the local energy administration bureau; two from the local department of industry and information technology; and two from industry enterprises.

These experts reviewed the questionnaire back-to-back in order to avoid mutual interferences of opinions. After we collected comments, we synthesized the comments according to our judgements and revised the questionnaire accordingly. Secondly, the questionnaire was distributed to respondents (i.e., senior managers in charge of energy-saving) from twenty enterprises. The respondents were encouraged to point out the expressions that were still unclear or ambiguous. After the pretest, the formal questionnaire with 17 items was finally formulated.

3.2. Sample and Data Collection

The data was collected in Liaoning province, China, between February and May in 2018. We chose Liaoning because it is an old industrial base in China, and is thus one of the most energy consumption provinces in China. Industrial energy consumption in Liaoning increased from 60.82 Mtce in 1995 to 140.10 Mtce in 2012, and to 210.31 Mtce in 2016. In 2016, Liaoning's industrial energy consumption ranked the sixth largest among the 34 Chinese provinces, after Hebei, Jiangsu, Shandong, Henan, and Guangdong [47]. Also, according to the newly published energy statistical yearbook, the reduction of industrial energy consumption per GDP in Liaoning was the lowest among all provinces in China, only 0.41% when comparing the highest reduction of 9.42% in Gansu. Apparently, Liaoning is one of the most challenging provinces in adopting IECP. Examining how government communication facilitates policy understanding of IECP in Liaoning is consequently a significant research focus.

While considering data accessibility, we use high-tech enterprises in Liaoning as the sample base. In order to assure the randomicity of the measuring sample, we first used the list of more than 1700 registered high-tech enterprises in Liaoning to make a sampling frame, and used the Random Number Table Sampling Method to obtain 400 enterprises to be investigated. Then, we sent the electronic questionnaire to the senior managers in the selected enterprises who are in charge of energy saving and emission reduction in their enterprises by e-mail. A total of 341 questionnaires were recovered, of which 295 questionnaires were valid; the effective rate is 73.75%.

As shown in Table 2, among the 295 enterprises surveyed, 40.3% have capitals less than 20 million RMB, 43% have capitals between 20 million and 100 million; 19.6% enterprises' business life is less than five years, 27.5% between six and 10 years, 23.4% between 11 and 15 years, 22.7% between 16 and 20 years, and only 6.8% more than 20 years. Most respondents come from manufacturing enterprises (61.4%). The enterprise characteristics in this research have similar capital and operating time distributions as all high-tech enterprises in Liaoning.

Table 2. Descriptive Statistics of Respondents.

Measure	Option	%	Measure	Option	%
Capital Size	≤ ¥ 20m(million)	40.3	Industry	Manufacturing	61.4
	¥20m–¥50m (include)	24.7		Information Technology	12.9
	¥50m–¥100m (include)	18.3		Environment and Public Facilities	0.6
	¥100m–¥200m (include)	9.2		Agriculture, Forestry, Husbandry and Fishery	1.4
	¥200m–¥400m (include)	4.4		Scientific and Technical Services	9.2
	>¥400m	3.1		Construction	1.4
Operating Life (%)	1–5 Years	19.6		Leasing and Business Services	0.3
	6–10 Years	27.5		Energy Production and Supply	1.4
	11–15 Years	23.4		Others	11.5
	16–20 Years	22.7			
	>20 Years	6.8		Total	100.0

3.3. Data Analysis Methods

To analyze the data, a two-stage data analysis strategy was adopted by using SPSS20.0, to explore the influence of different dimensions of government communication on different types of policy understanding. The first step was to conduct Exploratory Factor Analysis (EFA) to determine the three-dimensions of government communication before policy implementation. In the next step, Ordinary Least Squares (OLS) regression was applied to examine how the three dimensions of government communication affect the subjective understanding, objective understanding, and overall policy understanding, respectively.

4. Data Analysis and Results

4.1. Exploratory Factor Analysis

To begin with, this study utilizes KMO and Bartlett test to examine the suitability of the collected data for factor analysis. The results show that the KMO value of the scale is 0.868 (> 0.5), which indicates that the data is suitable to conduct factor analysis; Bartlett test value of sphericity is 2763.655 ($P < 0.000$), which indicates that there are common factors existing in the correlation coefficient matrix.

Varimax Rotation method is employed in exploratory factor analysis of government communication. As it is shown in Table 3, the nine variables have significant loadings on three factors, and all the factor loadings are above 0.5, which indicates that there are three underlying dimensions of government communication, explaining 89.49% of the variation of the data. Of the nine items, A1–A3 can be named as the factor of Prior Communication (PC), A4–A6 can be named as the factor of Policy Marketing (PM), and A7–A9 can be named as the factor of Policy Training (PT).

Table 3. Rotation Loadings of Exploratory Factor Analysis.

Item	PC	PM	PT
A1	0.827		
A2	0.739		
A3	0.838		
A4		0.707	
A5		0.780	
A6		0.767	
A7			0.590
A8			0.654
A9			0.698

The Cronbach's alpha (or internal consistency coefficient) is used to test the reliability of the three dimensions. The data is reliable if the internal consistency coefficient is greater than 0.7 (Diamantopoulos and Siguaw, 2000). The Cronbach's alpha of PC, PM, and PT are 0.960, 0.945, and 0.899, respectively (see Table 4), all of which shows that the measurement scales of each dimension have high reliability and consistency between related items.

Table 4. Descriptive statistics of the constructs.

Dimensions	Item	Mean	Sd.Error	Cronbach α
PC	A1 A2 A3	3.482	0.823	0.960
PM	A4 A5 A6	3.281	0.969	0.945
PT	A7 A8 A9	2.659	0.956	0.899

4.2. Ordinary Least Squares Regression

OLS is applied to analyze the influence of each dimension of government communication on policy understanding. We set up three models to analyze the effects of PU, PT, and PC on SU (Model 1), OU (Model 2), and PU (Model 3), respectively. Besides, in order to handle the effect of enterprises' operating years and capital size on dependent variables, we introduce these two variables into the models as control variables.

Statistical assumption tests are conducted before the analysis for obtaining robust results. As it shows in Table 5, the correlation matrix indicates that there are covariant relationships between the independent variables and the dependent variables at different confidence levels. Specifically, PC shows significant positive correlation with SU, OU, and PU; PT shows significant positive correlation with SU, OU, and PU; Operating years (i.e., life) show significant negative correlation with SU. The accurate relationship between the independent variables and the dependent variables need to be further verified through regression analysis. Moreover, multicollinearity is the major concern for OLS; none of the bivariate correlation coefficient is higher than 0.9, and all the variation inflation factors (VIF) are below 2, which indicates that multicollinearity is not a problem in this research. Finally, the results of Durbin-Watson test show that the error terms are independent and no autocorrelations are present in three regression models.

Table 5. Correlation matrix.

Dimensions	PC	PM	PT	SU	OU	PU	Size
PC	1						
PM	0.085	1					
PT	−0.107	0.01	1				
SU	0.115 *	0.029	0.334 **	1			
OU	0.120 *	−0.047	0.508 ***	0.124 *	1		
PU	0.156 **	−0.007	0.610 ***	0.577 ***	0.857 ***	1	
Size	0.029	0.026	0.007	−0.067	−0.031	−0.057	1
Life	0.001	0.066	0.001	−0.157 **	−0.032	−0.102	0.225 **

* Significant correlation at 0.05 level (two way); ** significant correlation at 0.01 level (two way); *** significant correlation at 0.001level (two way).

Model 1 tests the relationship between subjective understanding and three dimensions of government communications (Table 6). The F statistics of 17.56 is significant at 0.001 level, indicating that the linear relationship between the independent variable and the dependent variable is significant in general. The t-tests are significant of PC (standard coefficient = 0.152, $p < 0.01$), PT (standard coefficient = 0.351, $p < 0.001$), and Life (standard coefficient = −0.150, $p < 0.01$), revealing that prior consultation and policy training have significant and positive effects on subjective understanding, and life has negative influence on subjective understanding. The three variables explain 22.6% of variance in subjective understanding.

Table 6. Ordinary Least Squares (OLS) regression results.

Dimensions	Model 1 SU			Model 2 OU			Model 3 PU		
	coefficient	t	Sig.	coefficient	t	Sig.	coefficient	t	Sig.
PC	0.152 **	2.797	0.006	0.131 *	2.229	0.027	0.180 **	3.148	0.002
PM	0.024	0.439	0.661	−0.057	−0.967	0.334	−0.017	−0.295	0.768
PT	0.351 ***	6.469	0.000	0.553 ***	7.914	0.000	0.630 ***	8.507	0.000
Size	−0.041	−0.734	0.464	−0.028	−0.476	0.635	−0.042	−0.728	0.467
Life	−0.150 **	−2.714	0.007	−0.022	−0.376	0.707	−0.092	−1.577	0.116
F value	17.56 ***			26.76***			28.810 ***		
Adjusted R^2	0.226			0.321			0.332		

* significant at 0.05 level; ** significant at 0.01 level; *** significant at 0.001 level.

Model 2 examines the relationship between objective understanding and three dimensions of government communication (Table 6). The F value, 26.76, is significant at the 0.001 level. The t-tests are significant of PC (standard coefficient = 0.131, $p < 0.05$), PT (standard coefficient = 0.553, $p < 0.001$), showing that prior consultation and policy training positively affect objective understanding, and the two variables explain 32.1% of variance in objective understanding.

Model 3 examines the relationship between overall policy understanding and three dimensions of government communication (Table 6). The F value, 28.81, is significant at the 0.001 level, indicating that the three dimensions are related to overall policy understanding. The t-tests are significant of PC (standard coefficient = 0.18, $p < 0.05$), PT (standard coefficient = 0.63, $p < 0.001$), showing that prior consultation and policy training positively affect overall policy understanding, and the two variables explain 33.2% of variance in overall policy understanding.

5. Findings and Discussions

Based on the data analysis and the results in the previous section, we can infer three main findings in this research. First of all, among the three dimensions of government communication, prior consultation and policy training have significantly positive influence on policy understanding, while policy marketing does not show any significant effect on policy understanding.

To explain this finding, we rely on the "gap analysis model" in service delivery management [48,49]. Based on Gelders and Ihlen [48]: "The [gap analysis] model shows why producers and consumers see quality in different ways and demonstrates the importance of expectations and perceptions in service delivery". The model offers us a formal means of identifying the gap between government and enterprise in terms of expecting and interpreting a certain policy, in our case the IECP. It can explain why certain aspects of government communication can positively influence policy understanding, while others not by considering the extent to which the aspects of government communication can reduce the gap.

In terms of prior consultation, because its function lies in collecting ex-ante information from the enterprises regarding their own statuses, willingness, and difficulties pertaining to a potential policy, it can play a role in reducing the gap of policy expectation between government and enterprise given that the government analyzes, evaluates, and incorporates the practical situations of the enterprise during policy design. In extant literature, scholars also demonstrate that "Trust and satisfaction with the government will be increased by prior consultation of [government] ambitions [potential policies] than by ex-post communication of results [implemented policies]" [50].

Likewise, policy training can reduce the knowledge gap of technical complexity between government and enterprise. The actions of government to explain technical terminologies and provide technical training and operational professionals for the enterprise can help the enterprise to reduce technical uncertainties and risks in running the new energy-saving production process [51].

However, what we did not expect is that policy marketing plays little role in reducing the gap between government and enterprise. Policy marketing is often a strategy of customer-oriented

governments to match their policy products with the needs of the target group, and thus to "sell" their policies to the target group [29]. Theoretically, policy marketing can effectively enhance policy understanding by facilitating information transmission and advocating policy benefits to the target group. But, the positive effect of policy marketing on policy understanding largely depends on accurately identifying the needs of the target group and making every effort to inform the target group to what extent the policy can meet their needs. However, in practice, in order to gain broader support from the society, the government tends to use media channels to propose the policy itself and its potential benefits for the general public, little attention is given to market the benefits of the policy specifically for enterprises. This phenomenon is especially prevalent in the field of energy conservation in China. In our case, although the government will mention the benefits that enterprises will obtain from implementing IECP, it mainly advocates the societal benefits that will generate from the policy, which makes policy marketing a pure sermon instead of a communication. As a result, the effectiveness of policy marketing has been greatly reduced.

The second finding of this article is that, when compared with prior consultation, policy training has shown much stronger positive effect on encouraging a higher level of policy understanding. This reveals that the enterprises pay more attention to technical uncertainties and risks than opinion incorporation in an emerging policy. This can be explained from the abovementioned arguments. When compared to prior consultation, the enterprises pay more attention to policy training that deals with technical complexities because technical training may reduce potential costs and losses associated with the adoption of the new policy.

The third finding is that the active role and the relative importance of policy training and prior consultation vary with different dimensions of policy understanding. In particular, prior consultation has a greater impact on prompting subjective understanding than objective understanding. While the situation is quite different when it comes to policy training, the positive influence of policy training on objective understanding is stronger than that of subjective understanding. This can be well explained from the functions of prior consultation and policy training. Prior consultation is collecting and incorporating situations and opinions of the enterprise into policy design, which will increase the self-efficacy of the enterprise respondent to interpret the policy, and consequently enhance subjective policy understanding. In contrast, policy training lies in facilitating the enterprise to understand the technical terminologies and operation procedures of the policy, which is the objective knowledge of the policy. From this perspective, policy training will play a greater role in promoting objective rather than subjective policy understanding.

6. Conclusions

In this article, we aim to answer the question: can government communication facilitate policy understanding toward energy conservation. To conduct the research, we distinguish three dimensions of government communication, including prior consultation, policy marketing, and policy training. Regarding policy understanding, we not only focus on the overall level of policy understanding, but also make a distinction between subjective and objective policy understanding.

The main conclusions are that government communication can facilitate policy understanding, and that the different dimensions of government communication play varying roles in fostering different aspects of policy understanding. In particular, we find that only prior consultation and policy training have significant influence on policy understanding, while policy marketing does not have any significant effect on improving policy understanding. In addition, we find that the role of policy training in fostering policy understanding is stronger than that of prior consultation. The former lies in promoting subjective policy understanding, while the later lies in enhancing objective policy understanding.

These findings have important implications on the focus of government attention during policy design. With limited attention and resources, the government should pay more attention to and invest more resources in policy training activities, in order to reduce the technical risks of the enterprises in

adopting IECP and to increase objective policy understanding. Additionally, the government should pay attention to prior consultation actions to collect and incorporate opinions of the enterprises in policy design. This will increase the self-efficacy of the enterprises toward policy understanding; this will also benefit the government with higher accountability and more evidence-based policy making. As for policy marketing, at this moment in this particular case, the government may invest few resources on conducting policy marketing actions because of its little impact on policy understanding. Otherwise, if the government uses policy marketing to increase policy understanding, then the government should shift the way of policy marketing from simple advocating its general societal benefits to emphasizing the benefits specifically for the target group.

The generalizability of our research findings depends on the institutional context of energy conservation. Our results are generalizable in countries that are undergoing economic transitions. In these countries, the private economy is just started and the private enterprises are newly emerged. The capacities of the private enterprises in terms of bottom-up appeal, application of new technologies, and the development of corporate social responsibility are relatively weak [52–55]. Given these constraints, policy understanding toward energy conservation will largely depend on top-down enquiries and concerns (such as prior consultation), and government sponsorship and support (such as policy training to reduce technical complexities). Policy marketing that promotes societal benefits of energy conservation while ignoring spreading information, particularly on benefits for enterprises will make little sense because the private enterprises in transition economies hold a relatively low level of corporate social responsibility.

The generalizability of our research findings in market economies would be limited. In countries that have built up a mature market economy, the private enterprises are very experienced with active participation in the policy design and implementation stages. Lobby groups and enterprise associations are good at presenting the enterprises' concerns and striving for the maximum benefits. In such circumstances, a top-down style prior consultation might be not appreciated by the enterprises; the enterprises are more inclined to actively express their opinions and recommendations in a bottom-up manner. In addition, the private enterprises in a mature market economy have usually accumulated abundant experience with applying new technologies and upgrading the production processes. Policy training by government would thus play little role in facilitating policy understanding. On the contrary, policy marketing would be expected to generate significant impact on policy understanding, because the private enterprises in a mature market economy are more sensitive to messages that advocate social benefits and are good at exploring the business-social relationship.

With the above mentioned conclusions, a limitation of this article is that we restricted our focus to the link between government communication and policy understanding. However, there may be other influential factors for policy understanding, such as government transparency, policy presentation, etc. That being said, we suggest that additional research is required as to how different factors, or the combination of different factors, will affect the level of policy understanding.

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