Hindawi

Research Article

Examining and Expanding the Expectancy Disconfirmation Model: Evidence from Rural China

Peng Wang (iD) **and Fengchun Fan**

Department of Public Administration, Sichuan University, Chengdu 610065, China

Correspondence should be addressed to Peng Wang; wpeng@stu.scu.edu.cn

In public management research, the Expectancy Disconfirmation Model (EDM) is increasingly used to measure citizen satisfaction. However, current EDM research in the public sector has been applied primarily in the United States and sets of the city, state, federal, or local government services. It leaves the validity of EDM for other levels and countries of government services to be verified. This study tests and extends the EDM by comparing it with previous studies and adding additional expectation priors to the model. Analysis of survey data from 313 citizens in 6 rural communities in China indicates that the basic model functions well in rural public services. In addition, the study of the extended EDM shows significant relationships between trust, service awareness, bureaucratic responsiveness, and expectations, which suggests new directions for future research using the model.

1. Introduction

With the emphasis on government performance in public management research, measuring citizens' satisfaction with public services has become crucial. The Expectancy Disconfirmation Model (EDM), initially used in business to measure customer satisfaction, is increasingly applied to government service research [1–4]. The theory suggests that citizens' satisfaction with public services depends on an implicit comparison between perceived service quality and pre-expectations (disconfirmation). Van Ryzin (2004) first applied the model to the field of public administration [1], and numerous studies have found that the model functions well when applied to public administration [5–7].

However, current EDM research in the public sector has been primarily applied in the United States and focused on urban, state, federal, or local government services. It leaves open the question of the effectiveness of EDM for other levels and nations of government services, especially for rural government services, which have not been tested for EDM. So, we conduct a study on rural public services in China. First, the model's applicability in a differential setting is worth verifying. Second, China has a large rural population, with important practical implications for future applications. Last, rural public services in China are mainly supplied by the government, consistent with the scope of EDM applications in the public sector.

Nevertheless, urban and rural citizens may have diverse concerns about public services in China due to disparities in the type and quality of public services provided in rural and urban areas. Combined with variances in the political environment and government responses, this may lead to significant differences in rural and urban citizens' expectations of government services and the processes that generate those expectations. In addition, difficulties exist in improving the quality of public services in rural China due to input constraints, and expectations become a crucial factor influencing rural citizens' satisfaction with public services. How to influence citizens' expectations becomes a critical clue to improving satisfaction with public services in rural China, and again this is a limitation of current EDM. Therefore, we expanded the model's expectation antecedents to understand better the factors that influence rural residents' expectations.

This study first validates the model using survey data of public services in rural China and compares it with previous

studies. Our findings indicate that EDM has good applicability in China's rural public services, which aligns with theoretical expectations. Comparisons with previous research findings suggest that the model's parameters can maintain some consistency with US city and local government services, even if there are differences in the testing environment, sampling, and survey methodology. Second, we expand the EDM and find significant relationships between trust, service awareness, bureaucratic responsiveness, and expectations, providing new perspectives for the model's future expansion and application.

In the following article, we provide an overview of EDM and discuss the literature on its application in public administration. We then explain the rationale for testing the model in rural China and the reasons for including the antecedent variables of expectations. Next, we describe the methods used to collect data in rural China and the measures used to process the variables. Then, we discuss statistical techniques and comparative results with previous studies and antecedents of expectations. Finally, we discuss future research, theoretical and practical implications, implications for public administrators and researchers, and how to improve perceived performance.

2. Theory and Hypotheses

Expectation disconfirmation theory originated from social psychology and organizational behavior and is widely used to study marketing consumer satisfaction and consumer behavior. The theory suggests that consumers form initial expectations about product performance before buying or using a product. The actual product performance they receive afterward is inconsistent with their initial expectations, which, together with initial expectations, affects consumer satisfaction [8]. The difference between expectations and perceived (goods or services) actual performance is disconfirmation. Disconfirmation can be positive (when performance exceeds expectations) or negative (when performance does not meet expectations). Oliver argues that disconfirmation is crucial because expectations may change over time. Theoretical construction and model testing have been refined in different consumer behavior studies [8–10] and are supported by empirical studies [8, 11].

According to the assumptions of the expectation disconfirmation model (Figure 1), prior expectations are critical variables in the model that directly and indirectly affect subsequent perceptions. Path A suggests a negative correlation between expectations and disconfirmation. As expectations increase (decrease), disconfirmation decreases (increases), or high expectations lead to negative disconfirmation. Path B indicates a positive correlation between perceived performance and disconfirmation, that is, high perceived performance will lead to positive disconfirmation and vice versa. Path C represents the direct and positive relationship between disconfirmation and satisfaction. Positive disconfirmation (higher performance than expected) leads to higher satisfaction, and negative disconfirmation (lower performance than expected) leads to lower performance satisfaction. Path D indicates a direct
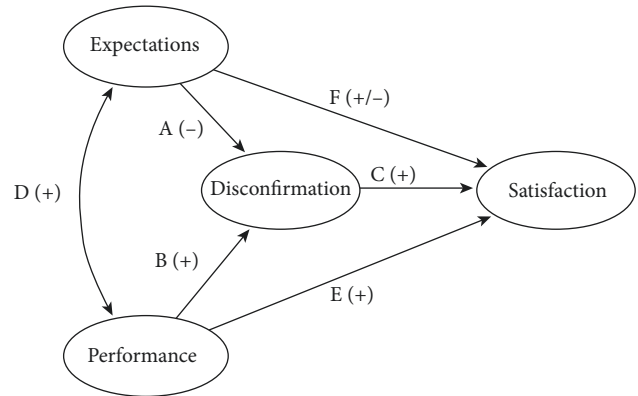

FIGURE 1: Expectancy disconfirmation model [12].

positive relationship between expectations and performance, with higher expectations leading to higher perceptions of performance, although the causal direction of this relationship is not explicitly stated [12]. Path E is the direct relationship between performance and satisfaction, where higher performance should logically lead to higher satisfaction, implying a direct effect of performance on satisfaction. Path F indicates the effect of expectations on satisfaction, which can be either positive or negative. When forming satisfaction, people may use previous expectations as a benchmark or starting point, primarily when the evaluated service is ambiguous [12]. Differences in empirical and normative expectations may be related to satisfaction in different directions due to empirical expectations (what you think will happen) may cause positive correlations, and normative expectations (what you think should happen) may cause negative correlations [2, 5]. Citizen expectations in this study are empirical expectations, so we assume that expectations positively affect satisfaction. When examining the direct effect on satisfaction, expectations and performance are assumed to exist prior to disconfirmation and are therefore conceptualized as exogenous variables.

EDM has been adopted and applied by a large number of academic studies [8, 11, 13]. However, public administration has been relatively late in using it to explain citizen satisfaction with government services, with Van Ryzin first applying EDM to public administration in 2004. Over the past few years, research on EDM satisfaction with government services has begun to increase [3, 5, 14, 15]. There are direct studies on model applicability and hypothesis relationship validation [1, 14, 16]. More other studies, while not testing the EDM directly and instead exploring the role of the model in the formation of citizen satisfaction, still found the EDM to be applicable in explaining government services [2, 3, 6]. In addition, some studies use EDM to examine specific local government services such as police services, residential garbage collection, public schools [5], and street cleaning [17]. Studies have also applied EDM in discussions of state government services [3, 5] and federal government services [16]. Moreover, some of these studies have tested EDM in institutional settings with limited accountability and widespread citizen distrust [18] and the impact of partial matching between voters and elected municipal leaders on

citizen satisfaction with municipal services [7]. Finally, there are studies on the impact of macroenvironmental variables on service quality in a cross-country context [19].

The development of EDM research in the public service context is an ongoing and continuous refinement process, and the application of the model in different areas of public service is yet to be further explored. The application of the government service model is mainly in urban, state, and federal areas and has not been tested in rural areas (Van Ryzin study in 2006 [14] for local government, although it included rural government, only involved 11% of rural citizens). In addition, current research primarily focuses on the United States, with scattered studies in Denmark and the United Kingdom, and the model's applicability to rural areas and across nations remains to be tested. We, therefore, conduct the study on rural public services in China, where the applicability of the model in different political and economic contexts is worth exploring on the one hand, and where China, with a rural population of over 500 million (36.11% of the total) [20], has important practical implications for future application. In addition, rural public services in China are mainly provided by the government, which is also in line with the application of EDM to government services.

Unlike conventional countries, scholars often view Chinese society as a dualistic structure of rural-urban divide [21, 22], that is, there is a relative pattern of rural versus urban areas, with significant differences in political, economic, and social environments. Therefore, rural areas are an essential field to test the model. There is a lack of empirical testing support to predict the applicability and effectiveness of the model in rural public services, and empirical findings in rural areas may be contrary to expectations. Indeed, there is good reason to suspect that the expectations of rural Chinese citizens for public services may differ significantly from those of citizens served by urban or local governments in other countries, leading to notable differences in the functioning of the EDM.

Possible differences in rural and urban citizens' expectations of rural and urban public services can lead to different relationships in EDM. First, there are specific differences in the types and quality of services in China between rural and urban public services, and citizens may have different experiences and expectations. For instance, there is considerable inequality in the distribution of resources between rural and urban public health care services [23], with cities often having large well-equipped hospitals and rural areas having only small clinics. There are inevitably differences in citizens' expectations of the health care services available to them, that is, citizens with major illnesses often have no expectations of rural health care services and have to resort to urban health care services. The same differences exist for services such as security, education, and employment, which vary so much in nature that it is reasonable to infer the relationship between rural citizens' expectations, perceived performance, and degree of disconfirmation in public services be different.

Another noteworthy fact is that due to China's fiscal decentralization system, governments are given the primary responsibility for the provision and financing of public services [24]. However, the poor economic conditions in rural areas and the excessive decentralization of spending responsibilities have led to inadequate funding and public services, thus making it difficult to improve the quality of rural public services. Expectations have become a key factor affecting rural citizens' satisfaction with public services. Although we do not advocate manipulating expectations to come to public satisfaction, a better understanding of expectations still can enable public managers, under limited conditions, to improve rural citizens' satisfaction as much as possible. Thus, we expanded the model's expectation priors to understand better the factors that influence rural citizens' expectations.

Regarding factors influencing expectations, it is essential to note that citizens' trust in rural government may influence their expectations of the services provided by this rural government. Political trust has been suggested as being positively associated with public service satisfaction. Citizens' political trust is relevant for citizens' subjective well-being [25]. Regarding the effect of citizens' trust before accessing a public service on their satisfaction after accessing it, we can expect that no transaction, let alone citizens' satisfaction, will likely occur without a minimum level of trust accessing a public service. If rural citizens do not consider their local hospital worth going to, they will not choose it. Thus, the relationship between trust and satisfaction is circular. Current levels of trust in government may impact perceptions of government performance [26]. For a first-time public service recipient, initial trust is formed by indirect experiences, such as reputation, others' evaluations, and ethos, even though he or she has no previous direct experience of receiving public services. When a citizen trusts the government, he or she feels secure through an implicit belief that the government's actions will lead to positive rather than negative outcomes [27]. Therefore, a citizen who trusts the government more has more positive expectations than one who trusts it less.

In the case of China, there are considerable differences between rural and urban citizens' trust in government, and a Spanish study found that people in rural areas have lower political trust than in urban [28]. Also, in China, Chinese citizens "disaggregate" the state with high levels of trust for the central government, which falls dramatically as trust levels are noticeably lower for those in rural China [29]. The much lower trust in the rural government than in the central government may be a deeper reason for the difference in satisfaction between urban and rural citizens. Citizens' low trust in rural government leads them to hold low expectations when experiencing public services, which results in low satisfaction. Therefore, changes in the trust may lead to expected changes to alter the relationship between variables in the EDM. Thus, this article proposes the following hypothesis:

H1. Citizens' trust in rural government is positively related to their expectations of public services.

In addition, citizens' awareness of public service may also be an essential factor influencing expectations. Service awareness is usually based on previous interactions, direct or

indirect experiences, and learning about what, who, and how services are provided [30]. It is usually measured by whether the respondent is aware of the particular institution and its services [31]. Generally, citizens are not well aware of all the government policies and performance [32]. Policies information may originate from media, personal experiences, informal communications, and service providers [33, 34]. Citizens are prone to bias in receiving information, especially in insurance policy changes, such as the scope of diseases covered by health insurance, employment assistance policies, and low-income subsidy rates. In China, the education level of rural citizens is generally lower than that of urban citizens to the extent that rural citizens may have even lower awareness of public services. As the types of public services have increased in recent years, the relevant policies have changed rapidly, so there may be a situation where citizens are not familiar with the content of public services and have insufficient knowledge. When citizens are unclear or unfamiliar with the content of certain public services, they cannot know whether or how much they can access the services, and then they may not have clear expectations of the services. Thus, the extent to which citizens are aware of public services is likely to influence citizens' expectations of public services. Based on this, this research puts forward the following hypothesis:

H2. Citizens' awareness of public service policies is positively related to their expectations of public services.

An equally important variable that may shape citizens' public service expectations is bureaucratic responsiveness. Bureaucratic responsiveness is how administrators can quickly identify and track fluctuations in citizens' desires and provide the appropriate services needed [35]. In marketing, responsiveness is considered as a critical factor in shaping customer expectations and is widely used in the SERVQUAL model [36–38]. Research on the impact of bureaucratic responsiveness on citizens' expectations, especially in EDM's framework, still needs to be further explored in public management research. In rural China, the closer social distance between citizens also manifests between rural citizens and village committees (rural governments), with village chiefs' mailboxes and village assemblies as channels for rural citizens to express their needs. Thanks to the size of rural areas, population, flat hierarchical structure, and deliberative system, rural citizens have more convenient channels to communicate with the government than urban citizens, and the rural government's responsiveness can be direct. Typically, when rural citizens receive positive feedback on their needs, the expected needs are likely to be met, thus raising expectations for public services. Therefore, it is reasonable to suspect that the responsiveness of rural bureaucracies may also drive citizens' expectations of rural government services to influence EDM outcomes. Therefore, we propose the following hypothesis:

H3. Bureaucratic responsiveness to public needs is positively related to citizens' expectations of public services.

In summary, the above facts suggest a strong need for EDM testing of rural public services, which is currently lacking. Furthermore, we have extended the original model, which may be effective when applied to rural public services.

Therefore, we propose to study the extended model of EDM rural public services. The diagram of this model is shown in Figure 2.

In this extended version, the relationships of the variables in the original EDM model remain the same, but we hypothesize that certain preexisting perceptions of rural government will significantly affect citizens' expectations of rural public services. First, we hypothesize that trust in rural government may affect citizens' expectations of the services they receive, with those who express greater overall trust in rural government also holding higher expectations of the services they will receive, and vice versa. In addition, we hypothesized that citizens' awareness of public services would influence citizens' expectations of rural public services, with higher awareness of public services associated with higher expectations. Finally, we also hypothesized that bureaucratic responsiveness to citizens' needs has a positive and significant effect on expectations of rural public services, with higher levels of responsiveness associated with higher citizen expectations.

Five measures were used to control for the effects of external environments that may affect citizens' perceptions of service performance, expectations, and satisfaction. First, a previous study shows that gender and age significantly affect public service satisfaction. Male and older individuals tend to evaluate differences and rate higher the level of experienced satisfaction than female and younger citizens [39]. Second, household income, research shows that poverty levels are negatively related to the service performance of local governments [40], and household income has been suggested as positively related to normative expectations [41]. Third, education level was included because increased education was considered positively associated with normative expectations and negatively associated with positive expectations [42]. Last, the length of residence has also been positively correlated with citizens' satisfaction [43].

3. Data and Methods

Considering the possible influence of regional economic development status on services and citizens' perceptions, we stratified a sample of 21 regions in Sichuan province by GDP, divided these regions into 3 classes, randomly selected 1 region from them, and then randomly selected 2 rural communities from these regions to obtain 6 rural communities. We also conducted a stratified sampling of residents through the demographics of the community obtained from the village center. The questionnaire was administered to citizens of the rural communities in the sample through visits from March 2 to April 27, 2021. As some citizens cannot be reached, a total of 420 questionnaires were distributed, and 337 were returned, excluding invalid questionnaires, resulting in 313 valid questionnaires.

The questionnaires measured basic information, public service expectations, perceived service performance, degree of disconfirmation, satisfaction, trust in government, perceptions of public services, and bureaucratic responsiveness among citizens in rural communities. Van Ryzin's study in 2004 treats perceived service performance as a potential
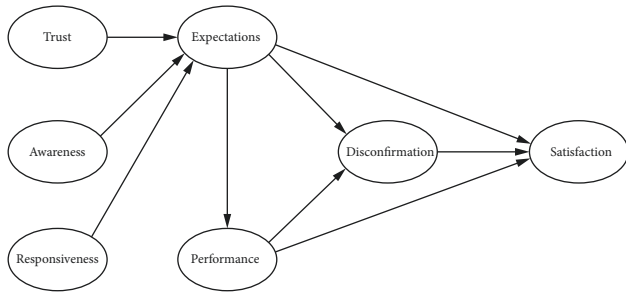
Figure 2: Expectancy disconfirmation model with antecedents of expectations.

variable measured by multiple indicators [1]. The same treatment was done to measure expectations since people may have different expectations for different public services. Measures of government responsiveness and service awareness also use multiple indicators. We classified the rural public services according to China's Urban and Rural Public Service Plan [44] in terms of service types. For the remaining variables in the basic model, disconfirmation, satisfaction, and trust, we followed the strategy used in previous EDM studies and measured them using a single observed variable.

Regarding the disconfirmation measure, we compare the subtractive measure used by Van Ryzin [1] with the ratings of perceived disconfirmation recommended by Oliver [9]. Subtractive measures may lead to a significant increase in the correlation between expectations, performance, and disconfirmation. Thus, we use Oliver's rating scale [9] for perceived disconfirmation. The measure of trust used the scale from previous EDM outreach studies [15, 16] from the American Customer Satisfaction Index (ACSI). To measure service awareness, we adopt the dimension of service awareness from Crist et al. [45], adapted from previous service awareness studies [46–48]. Responsiveness was measured using the SERVQUAL measure of responsiveness, but with the deletion of "tells citizens exactly when services will be performed" because this situation is hardly addressed in China's rural public services. To avoid a possible confusion of evaluation criteria due to different scales (a mixture of 1–4, 1–7, 1–10, and 1–100 scales were used in previous studies), we standardized the measurement of the model variables using a 7-point Likert scale, and the question wording and descriptive statistics of the model variables shown in Table 1.

4. Results

We used the structural equation model and the full information maximum likelihood estimation method (FIML) to analyze the primary and extended models of the EDM. FIML is a fully systematic approach that considers all the information provided by the structural equations, that is, all the equations applied in the structural model, and then estimates all the structural parameters simultaneously using the maximum likelihood method. FIML is widely used in the solution of SEM, outperforming lea squares regression in

various cases [49, 50], and it has been used in previous EDM studies for analysis [1, 14, 16]. All facts recommend we use this method in our study. The correlation matrix of variables in our structural model is shown in Table 2. The test results of the basic EDM model (Model 1) are shown in Figure 3. Table 3 compares the path coefficients of Model 1 with earlier studies. A discussion of these results is presented as follows.

Overall, Model 1 shows results that largely support EDM use in rural public services, and the model performs well as expected. The observed results also confirm the previous judgment that EDM application in their rural public services is effective. Looking specifically at the parameter estimates, the relationship between expectations and perceived performance ($\beta = 0.32$, $p < 0.001$) is significant and consistent with the expected positive correlation, suggesting that for citizens experiencing rural public services, higher citizen expectations have a positive effect on perceived public service quality is guided. The coefficient is also almost identical to the findings of Van Ryzin [1, 14] in Table 3 ($\beta = 0.32$ vs. $\beta = 0.34$, $\beta = 0.35$).

The relationship between expectations and perceived disconfirmation ($\beta = -0.36$, $p < 0.001$), similar to the results of Van Ryzin's 2004 study [1], is also inverse and significant, in line with the theory but with a lower degree of influence. On the other hand, the relationship between performance and perceived disconfirmation is confirmed, with a positive and significant relationship between performance and disconfirmation ($\beta = 0.45$, $p < 0.001$) and also very close to Van Ryzin study in 2004 ($\beta = 0.40$). Finally, the three variables in the EDM directly affect citizen satisfaction. Although the effect is relatively small, expectations are positively and significantly related to satisfaction ($\beta = 0.14$, $p < 0.05$). It is still higher than Van Ryzin's [14] model ($\beta = 0.14$ vs. $\beta = 0.10$). Although the effect was relatively small, the study found a significant positive correlation between expectancy and satisfaction ($\beta = 0.14$, $p < 0.05$). It is still higher than Van Ryzin model in 2006 ($\beta = 0.14$ vs. $\beta = 0.10$).

Perceived disconfirmation also had a positive and significant effect on satisfaction ($\beta = 0.40$, $p < 0.001$), suggesting that, as hypothesized in the model, those citizens who felt that rural public services exceeded expectations had higher public service satisfaction. In this model of rural public services, perceived disconfirmation is not as strong a determinant of satisfaction as in Van Ryzin's [1, 14] model ($\beta = 0.40$ vs. $\beta = 0.67$, $\beta = 0.49$), but it is also the strongest of the factors that influence satisfaction. Finally, the relationship between performance and satisfaction was positive and significant ($\beta = 0.22$, $p < 0.001$), as hypothesized in the EDM, suggesting that more robust performance (or better-perceived service quality) would lead to greater satisfaction. The performance-satisfaction relationship in the model test for rural public services was not as strong as in the test for Van Ryzin's model in 2006 ($\beta = 0.22$ vs. $\beta = 0.41$) but close to the results of Van Ryzin study in 2004 ($\beta = 0.20$).

In summary, the EDM tests in Chinese rural public services remain broadly consistent with past research, with little difference in model results between Chinese rural public services and US urban and local government services,

TABLE 1: Question wording and descriptive statistics for the model variables.

	Variables in order asked during interview	N	Min	Max	Mean	SD
Expectations	First—thinking back a few years—how would you rate your expectations back then of the quality of the flowing services? 1 = very low quality, to 7 = very high quality					
Police	Police protection	313	2	7	5.92	1.32
School	Public education	313	2	7	5.94	1.30
Health care	Community clinics	313	3	7	5.97	1.26
Hardship assistance	Poverty assistance	313	2	7	5.96	1.30
Labor and employment	Career guidance	313	2	7	6.02	1.32
Agricultural support	Agricultural assistance	313	1	7	5.81	1.45
Legal services	Legal consultation	313	2	7	5.92	1.38
Family planning services	Birth control guidance and consultation	313	1	7	5.95	1.32
Recreation and sports	Recreational and sports facilities	313	2	7	5.68	1.54
Quality	Considering all of your recent experiences, how would you rate the quality of the following services where you live? 1 = very low quality, to 7 = very high quality					
Police	Police protection	313	1	7	5.69	1.42
School	Public education	313	1	7	5.29	1.47
Health care	Community clinics	313	1	7	5.23	1.61
Hardship assistance	Poverty assistance	313	1	7	5.45	1.42
Labor and employment	Career guidance	313	1	7	4.89	1.78
Agricultural support	Agricultural assistance	313	1	7	5.34	1.73
Legal services	Legal consultation	313	1	7	5.27	1.71
Family planning services	Birth control guidance and consultation	313	1	7	5.473	1.65
Recreation and sports	Recreational and sports facilities	313	1	7	5.35	1.75
Satisfaction	Satisfaction means many things. Overall, how satisfied are you with the services provided by the local government where you live? 1 = very dissatisfied, to 7 = very satisfied	313	1	7	3.81	1.91
Perceived disconfirmation	Considering all of your expectations, to what extent have the services provided by your local government fallen short of your expectations or exceeded your expectations? 1 = fallen short of my expectations, to 7 = exceeded my expectations	313	1	7	3.99	1.35
Trust	How much of the time do you think you can trust the government in where you live? 1 = only some of the time, to 7 = always	313	1	7	4.96	1.76
Awareness						
	Before the survey, to what extent were you aware that all of the above services existed in this community? 1 = not at all aware, to 7 = very aware	313	1	7	5.14	1.63
	To what extent do you know about the public services you need? 1 = not at all, to 7 = very much	313	1	7	5.14	1.69
	To what extent do you know how to contact the service? 1 = not at all, to 7 = very much	313	1	7	5.12	1.60
Responsiveness						
	Do government officers give prompt service to citizens? 1 = not timely at all, to 7 = very timely	313	1	7	4.88	1.64
	Are government officers always willing to help citizens? 1 = not at all, to 7 = very willing	313	1	7	5.11	1.59
	Are government officers never too busy to respond to citizens' requests? 1 = completely disagree, to 7 = strongly agree	313	1	7	5.04	1.63

and are more supportive of the theory than Van Ryzin study in 2006 [14] tests at the local government level. It suggests that EDM theory is broadly applicable.

We see two sets of relationships that stand out the most in terms of differences. First, the negative effect of expectations on disconfirmation is weaker for rural than for urban public services, suggesting that expectations of rural public services have a relatively small effect on disconfirmation. Thus, there is less concern that overly high expectations will diminish the degree of disconfirmation and reduce

satisfaction. However, it may also be due to the different measurement methods. Unlike the univariate measurement in previous studies, the measurement of expectations in this study used multiple indicators, and the perceived measure of disconfirmation may also be another reason. As Van Ryzin explains, the model remains quite sensitive to the question of how to measure disconfirmation [14], and in addition, different political, economic, and cultural environments may also play a role in a transnational context. Further validation is pending for later studies.

TABLE 2: Correlation matrix of variables.

	1	2	3	4	5	6
1. Trust	—	—	—	—	—	—
2. Responsiveness	0.258	—	—	—	—	—
3. Awareness	0.341	0.494	—	—	—	—
4. Expectations	0.338**	0.402**	0.46**	—	—	—
5. Performance	0.125	0.149	0.170	0.371**	—	—
6. Disconfirmation	−0.062	−0.074	−0.085	−0.184	0.339	—
7. Satisfaction	0.052	0.062	0.071	0.154*	0.406**	0.449**

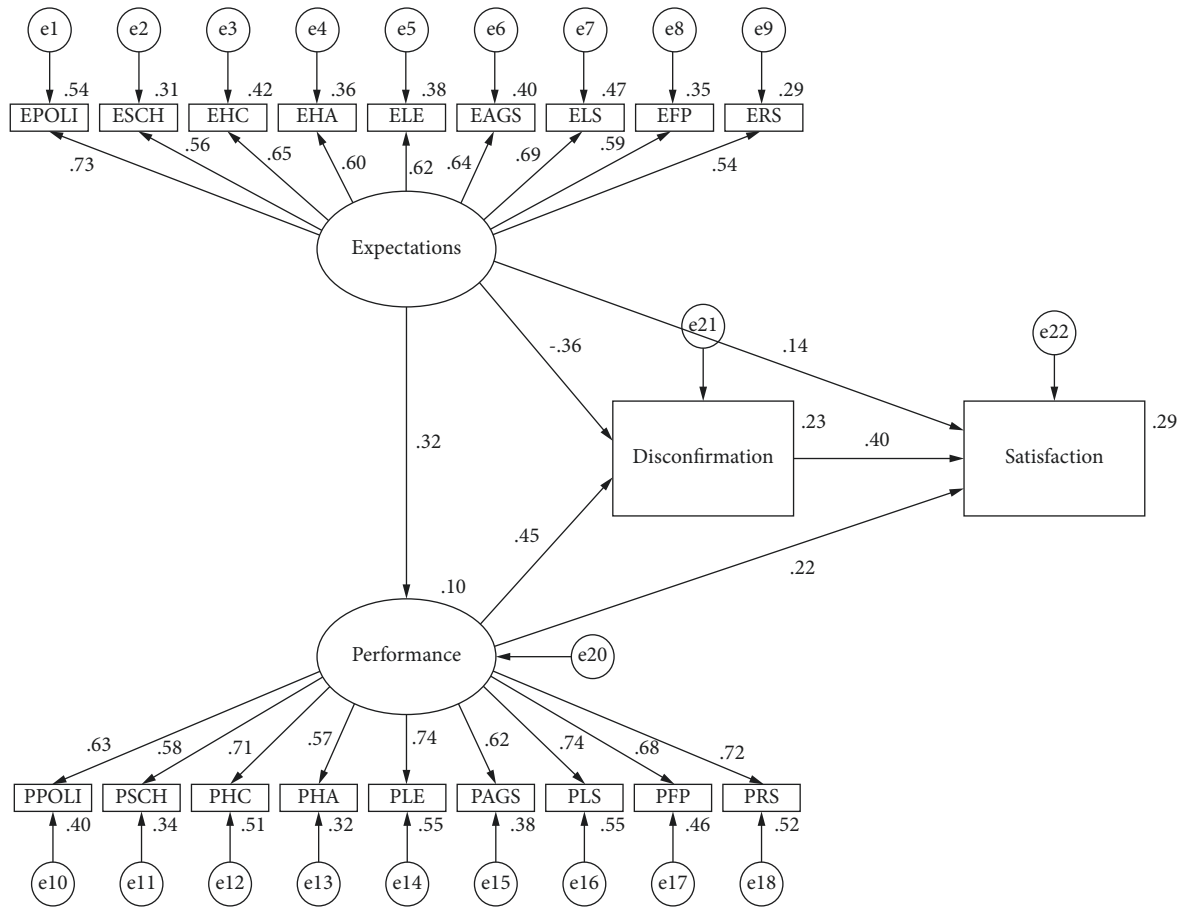*Significant at $p < .05$; **Significant at $p < 0.01$.

FIGURE 3: Model 1: the basic Expectancy Disconfirmation Model.

Another difference is that the direct effect of public service expectations on satisfaction is weaker in rural China than in urban government services but stronger than in the United States for local government services. Therefore, when the quality of public services is difficult to improve, increasing satisfaction with rural government by raising expectations of rural public services is still a better way to go. The theoretical and practical implications of these findings will be discussed in more detail in the article's final section.

After testing the basic EDM model, we also tested an extended version of the model with the addition of expectation priors (Model 2). The results of the tests are shown in Figure 4.

The results of Model 2 are consistent with the theoretical expectations. For the added expectations antecedents, the three hypotheses are fully supported. We find, first, that rural citizens' trust in government has a positive and significant effect on public service pre-expectations ($\beta = 0.18$, $p < 0.001$), supporting H1, which indicates that citizens' trust in rural government moderately influences their expectations of what public services they will receive from the rural government. Second, a positive and significant effect of the degree of knowledge about rural public services on public service expectations ($\beta = 0.29$, $p < 0.001$), supporting H2, means that more knowledge and familiarity with rural public services is associated with higher public service expectations. Finally, the degree of bureaucratic responsiveness also has a positive and significant effect on public service expectations ($\beta = 0.21$, $p < 0.001$), supporting H3, indicating that the more

TABLE 3: Comparisons of path coefficients with earlier studies.

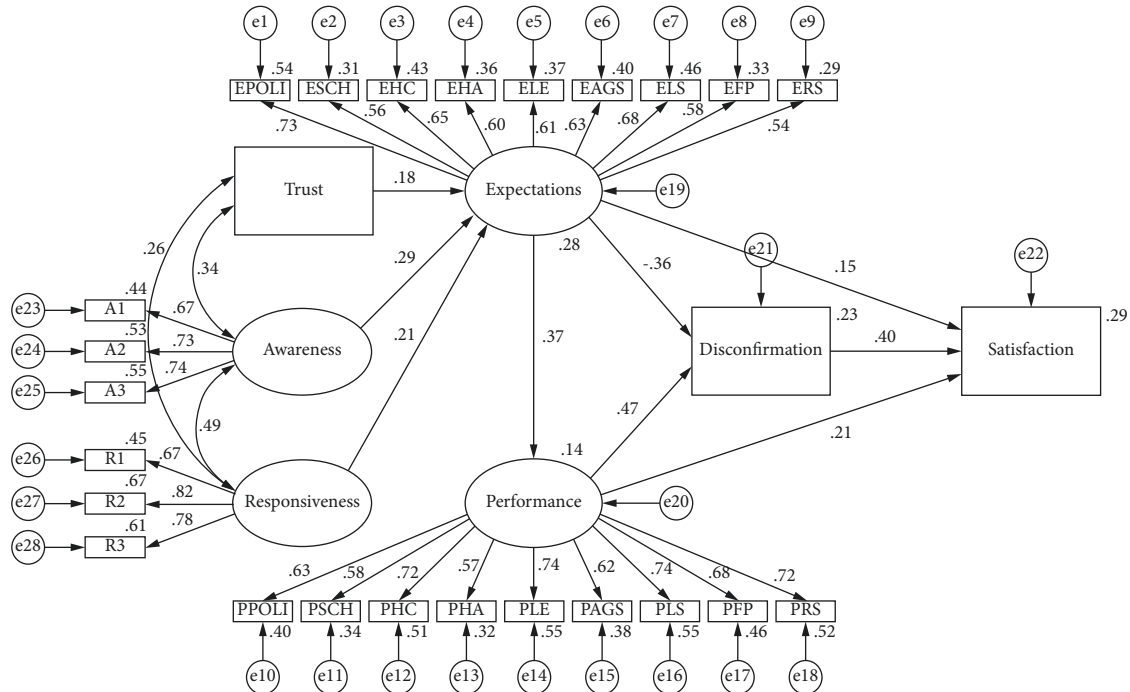|	This study Rural	Van Ryzin (2004) Urban	Van Ryzin (2006) Local government
Expectations —> performance	0.32	0.34	0.35
Expectations —> disconfirmation	−0.36	−0.68	0.03
Performance —> disconfirmation	0.45	0.40	0.68
Expectations —> satisfaction	0.14	0.69	0.10
Performance —> satisfaction	0.22	0.20	0.41
Disconfirmation —> satisfaction	0.40	0.67	0.49

FIGURE 4: Model 2: the expanded expectancy disconfirmation model.

responsive the government is, the higher the citizens' expectations of public services.

5. Discussion

This study applies the EDM to rural public services in China, thus filling a gap in the existing literature where EDM testing has focused only on the state, city, or local government level, and primarily in the United States. In addition, we complement the theoretical support of strategies to influence expectations when the service quality in EDM is challenging to improve. We have tested an extended version of this model that includes trust, service awareness, and bureaucratic responsiveness as influences on expectations of rural public services. The results show that research data on rural public services in China support the EDM model well, and the model results are similar to previous research on services at other levels of government. The extended EDM is also confirmed for rural public services, providing a good perspective for studying expectation influences. In sum, these findings suggest that EDM can help present the cognitive process by which citizens judge their satisfaction with rural public services, thereby helping researchers and public

managers better to understand citizen satisfaction with this rural public service.

Before discussing the implications of the findings, it is appropriate to mention the limitations of this study and suggestions on how to overcome these limitations in future studies. In terms of sampling, although the sampling was based on local demographics, the overall sample size is small. It may hardly reflect the complete picture of rural services in Sichuan province and China, especially since Sichuan is a vast province and there are significant differences between China's eastern and western parts. In addition, the relevance and accuracy may be lacking due to the different political environments from previous EDM studies, considering different political ideologies but using the same scale and question-wording for measuring trust. Therefore, in future studies, expanding the research sample and designing a scale more in line with localization will help identify EDM and expand the stability of EDM in a changing political environment.

In terms of the theoretical implications of this study, first, this study provides new dimensions for future research on EDM and public services, that is, the applicability of the model to different levels and cross-national government

services and how the model can be further expanded and refined in the future. Our study confirms that the EDM is valid at the level of rural government and rural public services and that the model shows relatively consistent results in a cross-country context and across different levels of government. Besides, our study provides new perspectives on extending EDM's refinement to understand further the antecedents and their role in influencing citizen satisfaction through expectations.

Regarding the practical implications of our study, the selection and extension of the rural public service domain are critical when considering the application of the model to different levels of government services. Because at the same level of regional development, the quality of rural public services is lower than in urban areas, and it is more challenging to promote rural citizens' expectations and satisfaction with limited improvements in rural public services. These findings can undoubtedly help public managers at the rural level better understand how their institutions, products, or services affect citizen satisfaction and the role of citizen expectations within them. Even in cases where it is hard to change citizen expectations (given the limited power and financial resources of rural Chinese governments), these results can still provide managers with an understanding of the disadvantages they may face in achieving their citizen satisfaction goals. For example, understanding that a decline in trust lowers expectations and adversely affects citizen satisfaction can certainly lead public managers to deepen their understanding of the importance of citizen trust and create an environment of positive expectations. Besides, understanding the extent to which a region's public services are categorized, how universal the content is, and how responsive agencies are to citizens can help managers understand the reasons for the higher (or lower) expectations that citizens bring to their interactions with agencies. Public managers should make more efforts to raise the expectations and satisfaction of citizens in terms of universal access to public service content and strengthen the sector's responsiveness under financial constraints.

Moreover, the results we found in our study may themselves have significant practical implications for urban and rural public administrators, among others. For example, we can draw some insights from the finding that expectations have a more significant impact on satisfaction at the level of rural public services in China than local government services in the United States. A possible reason for this is that because Chinese rural public services have made great strides relative to the local government services experienced by US citizens, rural citizens, particularly, enjoy more minimum living security, hardship assistance, and poverty alleviation services. These services have direct economic benefits for rural citizens and are more highly valued, leading them to fully consider their experiences and hold more realistic and rational expectations.

Finally, the positive role of citizens' perceptions of performance in increasing satisfaction with rural public services cannot be ignored. Although rural citizens' satisfaction can be influenced by changing expectations, for rural governments, the focus of rural public services should be more on tangible improvements in service quality to increase rural citizens' positive disconfirmation and satisfaction. Despite the limited financial power of rural governments, they can at least contribute to citizen satisfaction through internal performance and service quality improvement measures.

Data Availability

All data and models used during the study are available from the corresponding author by request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

References

[1] G. G. van Ryzin, "Expectations, performance, and citizen satisfaction with urban services," *Journal of Policy Analysis and Management*, vol. 23, no. 3, pp. 433–448, 2004.

[2] O. James, "Evaluating the expectations disconfirmation and expectations anchoring approaches to citizen satisfaction with local public services," *Journal of Public Administration Research and Theory*, vol. 19, no. 1, pp. 107–123, 2009.

[3] T. H. Poister and J. C. Thomas, "The effect of expectations and expectancy confirmation/disconfirmation on motorists' satisfaction with state highways," *Journal of Public Administration Research and Theory*, vol. 21, no. 4, pp. 601–617, 2011.

[4] M. Hjortskov, "Citizen expectations and satisfaction over time: findings from a large sample panel survey of public school parents in Denmark," *The American Review of Public Administration*, vol. 49, no. 3, pp. 353–371, 2019.

[5] C. H. Roch and T. H. Poister, "Citizens, accountability, and service satisfaction," *Urban Affairs Review*, vol. 41, no. 3, pp. 292–308, 2006.

[6] A. F. Filtenborg, F. Gaardboe, and J. Sigsgaard-Rasmussen, "Experimental replication: an experimental test of the expectancy disconfirmation theory of citizen satisfaction," *Public Management Review*, vol. 19, no. 9, pp. 1235–1250, 2017.

[7] S. Jilke and M. Baekgaard, "The political psychology of citizen satisfaction: does functional responsibility matter?" *Journal of Public Administration Research and Theory*, vol. 30, no. 1, pp. 130–143, 2020.

[8] R. L. Oliver, "A cognitive model of the antecedents and consequences of satisfaction decisions," *Journal of Marketing Research*, vol. 17, no. 4, pp. 460–469, 1980.

[9] R. L. Oliver, *Satisfaction: A Behavioral Perspective on the Consumer: A Behavioral Perspective on the Consumer*, Routledge, 2014.

[10] E. W. Anderson and M. W. Sullivan, "The antecedents and consequences of customer satisfaction for firms," *Marketing Science*, vol. 12, no. 2, pp. 125–143, 1993.

[11] R. N. Cardozo, "An experimental study of customer effort, expectation, and satisfaction," *Journal of Marketing Research*, vol. 2, no. 3, pp. 244–249, 1965.

[12] G. G. van Ryzin, "An experimental test of the expectancy-disconfirmation theory of citizen satisfaction," *Journal of Policy Analysis and Management*, vol. 32, no. 3, pp. 597–614, 2013.

[13] C. Fornell, M. D. Johnson, and E. W. Anderson, "The American customer satisfaction index: nature, purpose, and findings," *Journal of Marketing*, vol. 60, no. 4, pp. 7–18, 1996.

[14] G. G. van Ryzin, "Testing the expectancy disconfirmation model of citizen satisfaction with local government," *Journal of Public Administration Research and Theory*, vol. 16, no. 4, pp. 599–611, 2006.

[15] G. G. van Ryzin, "Pieces of a puzzle: linking government performance, citizen satisfaction, and trust," *Public Performance and Management Review*, vol. 30, no. 4, pp. 521–535, 2007.

[16] F. V. Morgeson, "Expectations, disconfirmation, and citizen satisfaction with the US federal government: testing and expanding the model," *Journal of Public Administration Research and Theory*, vol. 23, no. 2, pp. 289–305, 2012.

[17] Y. Noda, "Citizen expectations and satisfaction of service performance: lessons from subnational governments in Japan," *Asia Pacific Journal of Public Administration*, vol. 41, no. 3, pp. 142–156, 2019.

[18] N. Petrovsky, J. Y. Mok, and F. León-Cázares, "Citizen expectations and satisfaction in a young democracy: a test of the expectancy-disconfirmation model," *Public Administration Review*, vol. 77, no. 3, pp. 395–407, 2017.

[19] Y. Zhu, S. Freeman, and S. T. Cavusgil, "Service quality delivery in a cross-national context," *International Business Review*, vol. 27, no. 5, pp. 1022–1032, 2018.

[20] National Bureau of Statistics of China, "The seventh national population census bulletin: rural and urban population and mobile population," *National Population Census Bulletin*, http://www.stats.gov.cn/tjsj/tjgb/rkpcgb/qgrkpcgb/202106/t20210628_1818826.html, 2021.

[21] J. Knight and L. Song, *The Rural-Urban divide: Economic Disparities and Interactions in China*, OUP Catalogue, UK, 1999.

[22] D. J. Treiman, "The "difference between heaven and earth": urban–rural disparities in well-being in China," *Research in Social Stratification and Mobility*, vol. 30, no. 1, pp. 33–47, 2012.

[23] Y. Chen, Z. Yin, and Q. Xie, "Suggestions to ameliorate the inequity in urban/rural allocation of healthcare resources in China," *International Journal for Equity in Health*, vol. 13, no. 1, pp. 1–6, 2014.

[24] C. Shen and H. Zou, "Fiscal decentralization and public services provision in China," *Annals of Economics and Finance*, vol. 16, no. 1, pp. 53–78, 2015.

[25] L. Dong and D. Kübler, "Government performance, political trust, and citizen subjective well-being: evidence from rural China," *Global Public Policy and Governance*, vol. 1, no. 4, pp. 383–400, 2021.

[26] S. Van de Walle and G. Bouckaert, "Public service performance and trust in government: the problem of causality," *International Journal of Public Administration*, vol. 26, no. 8-9, pp. 891–913, 2003.

[27] S. S. Andaleeb, "An experimental investigation of satisfaction and commitment in marketing channels: the role of trust and dependence," *Journal of Retailing*, vol. 72, no. 1, pp. 77–93, 1996.

[28] F. Mitsch, N. Lee, and E. R. Morrow, "Faith no more? The divergence of political trust between urban and rural Europe," *Political Geography*, vol. 89, Article ID 102426, 2021.

[29] T. Saich, "Citizens' perceptions of governance in rural and urban China," *Journal of Chinese Political Science*, vol. 12, no. 1, pp. 1–28, 2007.

[30] S. Y. Komiak and I. Benbasat, "The effects of personalization and familiarity on trust and adoption of recommendation agents," *MIS Quarterly*, pp. 941–960, 2006.

[31] R. J. Calsyn and L. A. Roades, "Predicting perceived service need, service awareness, and service utilization," *Journal of Gerontological Social Work*, vol. 21, no. 1-2, pp. 59–76, 1994.

[32] A. Lupia, M. D. McCubbins, and L. Arthur, *The Democratic Dilemma: Can Citizens Learn what They Need to Know?*, Cambridge University Press, Cambridge, UK, 1998.

[33] C. J. Heinrich, "Measuring public sector performance and effectiveness," in *The SAGE Handbook of Public Administration*SAGE, Los Angeles, 2012.

[34] D. P. Moynihan, *The Dynamics of Performance Management: Constructing Information and Reform*, Georgetown University Press, Washington, D.C., US, 2008.

[35] E. Vigoda, "From responsiveness to collaboration: governance, citizens, and the next generation of public administration," *Public Administration Review*, vol. 62, no. 5, pp. 527–540, 2002.

[36] G. Benham, E. Z. Woody, and K. S. Wilson, "Expect the unexpected: ability, attitude, and responsiveness to hypnosis," *Journal of Personality and Social Psychology*, vol. 91, no. 2, p. 342, 2006.

[37] F. Pakdil and Ö. Aydın, "Expectations and perceptions in airline services: an analysis using weighted SERVQUAL scores," *Journal of Air Transport Management*, vol. 13, no. 4, pp. 229–237, 2007.

[38] A. Parasuraman, V. Zeithaml, and L. Berry, "SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality," *Journal of Retailing*, vol. 64, no. 1, pp. 12–40, 1988.

[39] Z. S. Dimitriades and T. S. Maroudas, "Demographic predictors of service satisfaction in Greek public organizations," *Measuring Business Excellence*, vol. 11, no. 2, pp. 32–43, 2007.

[40] D. Haubrich and I. McLean, "Assessing public service performance in local authorities through cpa - a research note on deprivation," *National Institute Economic Review*, vol. 197, no. 1, pp. 93–105, 2006.

[41] B. Duffy, "Satisfaction and expectations: attitudes to public services in deprived areas," *LSE STICERD Research Paper*, no. CASE045, 2000, https://ssrn.com/abstract=1158936.

[42] O. James, "Managing citizens' expectations of public service performance: evidence from observation and experimentation in local government," *Public Administration*, vol. 89, no. 4, pp. 1419–1435, 2011.

[43] M. A. Mohit, M. Ibrahim, and Y. R. Rashid, "Assessment of residential satisfaction in newly designed public low-cost housing in Kuala Lumpur, Malaysia," *Habitat International*, vol. 34, no. 1, pp. 18–27, 2010.

[44] Ministry of Civil Affairs of China, "Urban and rural public service construction plan (2016-2020)," *National-Level Special Planning*, https://www.ndrc.gov.cn/fggz/fzzlgh/gjjzxgh/201707/t20170707_1196830.html?code=&state=123 Report No. 2016-191, 2016.

[45] J. D. Crist, C. Michaels, D. E. Gelfand et al., "Defining and measuring service awareness among elders and caregivers of Mexican descent," *Research and Theory for Nursing Practice*, vol. 21, no. 2, p. 119, 2007.

[46] J. D. Crist, "Mexican American elders' use of skilled home care nursing services," *Public Health Nursing*, vol. 19, no. 5, pp. 366–376, 2002.

[47] D. E. Gelfand, *Aging and Ethnicity: Knowledge and Services*, Springer Publishing Company, New york US, 2003.

[48] D. E. Yeatts, T. Crow, and E. Folts, "Service use among low-income minority elderly: strategies for overcoming barriers," *The Gerontologist*, vol. 32, no. 1, pp. 24–32, 1992.

[49] C. K. Enders, "The performance of the full information maximum likelihood estimator in multiple regression models with missing data," *Educational and Psychological Measurement*, vol. 61, no. 5, pp. 713–740, 2001.

[50] C. K. Enders and D. L. Bandalos, "The relative performance of full information maximum likelihood estimation for missing data in structural equation models," *Structural Equation Modeling*, vol. 8, no. 3, pp. 430–457, 2001.