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Retraction

Retracted: Correlation Analysis of Population Educational Structure and Program Audience Share Based on Multisample Regression for Correction

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] J. Chen and H. Wu, "Correlation Analysis of Population Educational Structure and Program Audience Share Based on Multisample Regression for Correction," *Security and Communication Networks*, vol. 2022, Article ID 5437816, 9 pages, 2022.

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Research Article

Correlation Analysis of Population Educational Structure and Program Audience Share Based on Multisample Regression for Correction

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In order to solve the problem of mismatch of supply and demand of TV programs in different regions, this article attempts to start with the influencing factors of the demand structure of programs and explore ways to improve or solve this problem of mismatch of supply and demand. The population needs to accurately correlate with the TV program, and educational structure is mainly taken into consideration. The objective of this study is to analyze the correlation between the population's educational structure and the share of program rating using sampling of population. The method of multisample regression is used with the combination and derives the conclusion that the educational structure of the population has a significant impact on the share of program ratings. The proposed method introduces the population and the share of program ratings as explanatory variables and explained variables into the regression model to verify whether the educational structure of the population will affect the share of program ratings. Both the full-sample benchmark regression and robustness test results show that the educational structure of the population does affect the show's viewing share. The impact is mainly manifested in the difference in the impact of the proportion of the population of different educational backgrounds on the audience share of the same type of program. In order to increase the effective supply of programs, each region should arrange programs according to local conditions, and the presentation of programs should reflect stepped characteristics.

1. Introduction

As an intermediary that connects people to society and the relationship between people, it is inevitable that the media industry will play an important role in the economic and social fields. Relevant studies have shown that factors such as economy, region, population, and technology have an important influence on the development of the media industry [1–3]. As an important part of the media industry, TV programs play an important role in economy, society, and culture [4–6]. Generally speaking, the viewership share of different types of TV programs in a region not only reflects the degree of preference for the programs by the audience groups in the region, but also reflects the demand structure of various TV programs. The broadcast share of TV programs in a region reflects the supply structure of various TV programs in the region [7, 8].

The difference between the TV program's viewing share and the broadcast share represents the matching of the TV program's supply and demand. If there is a difference between the two, it means that there is a mismatch between supply and demand for TV programs, and the greater the difference, the more serious the mismatch [9, 10]. At present, the most influential ratings survey company in the world is AGB Nielsen. Others include Arbitron Company in the United States, BARB (Broadcaster Audience Research Board Limited) in the United Kingdom, TNS, Video Research Ltd. in France, and BBM in Canada [11–14]. Regarding China's domestic audience rating survey market, CCTV-Sofuri and AGB Nielsen accounted for almost all of the market, with

about 80% and 10–15%, respectively. At the same time, many scholars have carried out research in the field of program recommendation [15]. Yan et al. proposed an adaptive time model, which mainly uses program metadata for division [16]. Jie et al. provided an IPTV-based plug-in system to assist in recommendations [17]. Paolo et al. researched and improved the cold start problem of the IPTV system [18]. Jongwoo et al. realized user recommendation by clustering IPTV programs [19].

The structural characteristics of the audience group's demand for TV programs depend on the structural characteristics of the audience group itself, which in turn determines their viewing or selection behavior of TV programs [20, 21]. Two factors, social structure and media structure, will affect the media selection behavior of the audience. The audience's education and related income levels, work conditions, personal tastes, leisure time, and so forth are all specific factors that affect their choice of a certain medium. Relevant empirical research shows that population quality factors related to education do have a significant impact on the development of the media industry. Not only that, but demographic structural factors also play a significant role in industrial development. In view of this, this article will then study its impact on TV program ratings from the perspective of population educational structure, so as to provide relevant enlightenment for improving or solving the problem of TV program supply and demand mismatch.

2. Related Work

Based on the population, the classification of the study is made.

2.1. Overview of Viewership Share. With the continuous expansion of the TV media, the TV media are paying more and more attention to the statistical data of viewership ratings, such as determining the advertising prices of various channels and time periods and evaluating their own program types. The statistics of viewership share has become an important basis for them and advertisers to choose media, channels, program types, and time periods [22–24]. Current TV media ratings surveys are still very imperfect. First, relatively single ratings survey data cannot quantitatively analyze the factors that affect the program ratings. The second is the ratings survey system for postbroadcast surveys and analysis and evaluation of programs, and prebroadcast predictions are not possible for ratings [25, 26]. When Nielsen data is imported, basic data can be obtained. The data statistical analysis module can restatistically analyze data such as program type, channel, time period, and program analysis and provide graphical display statistics of previous data. Figure 1 shows the analysis and statistics module diagram of the existing ratings.

According to different viewpoints and perspectives, to extract the evaluation of data from different directions, we need to use data mining algorithms to perform cluster analysis on the data that affects the ratings and obtain the relationship factors that affect the ratings [27, 28]. In addition, a quantitative evaluation index system and accurate performance evaluation standards are formed, and reasonable statistics are made on various factors such as program time period benefits, channel evaluation, program type, channel coverage, actors, and directors, and quantitative analysis is performed within a specified time period. The evaluation indicators are visually displayed in user-defined charts, such as zoom able 3D column chart, pie chart, and line chart.

3. Methodology

The methodology is based on the correlation of the share measurement model where regression model is used as empirical purpose.

3.1. Share Measurement Model Design. The difference in education background will affect the individual's professional level, employment nature, time distribution, income level, and hobby type to a certain extent, thereby affecting their preference for different types of programs [29, 30]. In order to study whether the educational structure affects the viewership share of TV programs and how it affects it, this article will then combine the panel data of 29 provinces (cities, districts) in China from 2009 to 2019 and use a panel regression model to empirically test the educational structure of the population in different regions. For the impact on the share of TV program ratings, the empirical research of this article is divided into three parts: (1) full-sample benchmark regression to verify whether the educational structure of the population affects the TV program audience share; (2) based on the classification regression of samples from eastern, central, and western provinces, to test the regional difference of the population's educational structure to the share of TV program ratings; (3) sample classification regression based on the educational structure of the population and program types to test the influence of the proportion of the population with different educational backgrounds in each region on the audience share of different types of programs.

In the part of the full-sample benchmark regression, this paper establishes the following panel regression model for empirical purposes:

$$\text{ratings}_{i,t} = \beta_0 + \beta_1 \text{edu}_{i,t} + \nu_{i,t}, \tag{1}$$

$$\text{ratings}_{i,t} = \beta_0 + \beta_1 \text{edu}_{i,t} + \gamma \text{control}_{i,t} + \nu_{i,t}, \tag{2}$$

$$\text{ratings}_{i,t} = \beta_0 + \beta_1 \text{edu}_{i,t} + \gamma \text{control}_{i,t} + \eta_i + \nu_{i,t}, \tag{3}$$

$$\text{ratings}_{i,t} = \beta_0 + \beta_1 \text{edu}_{i,t} + \gamma \text{control}_{i,t} + \eta_i + \mu_t + \nu_{i,t}. \tag{4}$$

Here, $\text{ratings}_{i,t}$, $\text{edu}_{i,t}$, and $\text{control}_{i,t}$ represent the share of TV program ratings, the educational structure of the population, and other control variables in the t period in the i area. η_i and μ_t represent the individual fixed effect and the time fixed effect. $\nu_{i,t}$ is the random error term. From the perspective of the types of model (1) to model (4), model (1) is a panel OLS estimation regression model without control

Figure 1: Diagram of the existing audience rating analysis and statistics module.

variables; model (2) introduces control variables on this basis; model (3) controls individual fixed effects on the basis of model (2). Equation (4) further controls the time fixation effect.

In terms of the selection of the explained variable, since the "China TV Rating Yearbook" published the ratings share data of 15 types of TV programs in 29 provinces (cities, districts) from 2009 to 2019, this article directly introduces this indicator as an explained variable into the regression model [31, 32]. Considering that there is a very strong correlation between the broadcast share of TV programs and the audience share, this paper takes the broadcast share of TV programs as the explained variable to conduct a robustness test. Judging from the 2009–2019 data on the ratings and broadcast shares of various types of TV programs in 29 provinces (cities, districts) published in the "China TV Rating Yearbook," the absolute value of the difference between the broadcast shares (hereinafter referred to as the absolute difference) showed undulating characteristics during the study period and did not show a steady downward trend. In other words, there is a mismatch between supply and demand for various TV programs in major provinces (cities, districts) in my country, and this problem has not been effectively improved. Figure 2 depicts the average absolute difference between the viewership share and the broadcast share of various TV programs in 29 provinces (cities, districts).

In terms of the selection of explanatory variables, the National Bureau of Statistics has released sample data of the population of 31 provinces (cities, districts) who have not attended school, elementary school, junior high school, high school, junior college, or above. This article uses these sample populations with different educational backgrounds. The proportion of the number in the total sampled population reflects the educational structure of the population in each region. Regarding the selection of control variables, considering that economic, cultural, technological, and other factors will affect the TV program ratings, this article selects the number of public libraries to reflect the cultural public service level of each region and selects the number of cultural relics to reflect each region. Regarding the historical background of the industry, the number of Internet access ports is selected to reflect the level of technological development in different regions, the per capita GDP is selected to reflect the economic development level of each region, and the proportion of the added value of the tertiary industry is selected to control the macroenvironmental factors that affect the development of the tertiary industry. The original data of all control variables come from the "Regional Economic Yearbook" over the years. The final empirical sample of this article is the 2009–2019 data of 29 provinces, autonomous regions, and municipalities other than Qinghai and Tibet. Among them, 15 types of TV programs include TV series, movies, variety shows, news and current affairs, and finance. For a small number of missing values in the original data of the empirical sample, this paper uses the moving average interpolation method to fill in. In order to facilitate the comparison of the regression coefficients of different grouped samples, this paper will perform logarithmic processing on all variables when performing regression. The statistical description of all variables is shown in Table 1.

From the perspective of the population educational structure of the provinces in the eastern, central, and western regions, the proportion of the population with no schooling and primary school education is the largest in the western provinces, followed by the central provinces, and the eastern provinces are the smallest. Regarding the junior high school education, the proportion of the population is the largest in the central region, followed by the eastern region, and the smallest in the western region; the proportion of the population with a high school education shows a pattern of decreasing in the east, middle, and west. Regarding the proportion of the population with a college degree and above, the provinces in the eastern region have an absolute leading advantage, and the provinces in the central and western regions are relatively close. Figure 3 shows the distribution of the educational structure of the population in different cities.

In further analysis of the educational structure of the population in each province (cities, districts), this article found that in addition to the three provinces of Yunnan, Gansu, and Guizhou, which accounted for the proportion of the population with a primary school education, all provinces (cities, districts) have the least proportion of the population without going to school.

4. Empirical Analysis

4.1. Full-Sample Benchmark Regression. This article first takes the proportion of the population who has not gone to school as an explanatory variable and introduces the TV program audience share as an explained variable into the regression model to test whether the population's educational structure affects the TV program audience share. The results of the full-sample benchmark regression are shown in Table 2.

Figure 2: The average absolute difference between the viewing share and the broadcast share of various TV programs in 29 provinces (cities, districts).

Table 1: Variable statistical description.

Variable name	Indicator name	Unit	Average value	Standard deviation	Minimum	Max
Ratings	TV show ratings share	%	6.67	8.70	0.00	47.00
Broadcast	TV show broadcast share	%	6.67	6.47	0.00	30.00
Non	Proportion of population who have not attended school	%	5.05	2.22	1.42	14.10
Primary	Percentage of population with primary school education	%	24.38	6.11	8.06	42.21
Junior	Percentage of population with junior high school education	%	36.49	5.28	18.52	66.83
High	Proportion of population with high school education	%	13.48	3.32	6.45	24.42
College	Proportion of population with college degree and above	%	12.22	7.00	2.85	47.69
Library	Number of public libraries	Individual	102.28	45.47	20	206
Cultural_relics	Cultural relics	Set	857402.5	800594.3	39895	4199935
Internet	Internet broadband access port	Ten thousand	1728.01	1576.27	38.90	8335.02
Pergdp	GDP per capita	Yuan/person	50984.53	26653.71	10309.00	164220.00
gdp3	Proportion of the added value of the tertiary industry	%	45.47	9.75	28.62	83.52

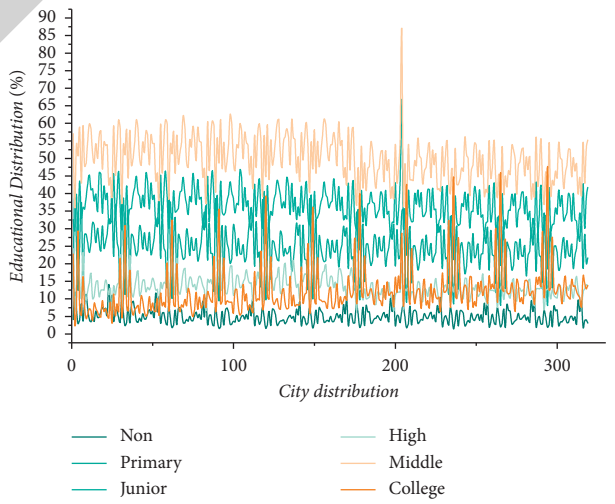

Figure 3: The distribution of educational structure of population in different cities.

Table 2: Full-sample benchmark regression results.

Model	(1)	(2)	(3)	(4)
Variables/statistics	Ratings	Ratings	Ratings	Ratings
Non	1.244***	0.742***	0.805***	0.779***
	[9.58]	[5.17]	[5.28]	[4.95]
Library		−0.00595*	−0.00871*	−0.00731
		[−1.81]	[−1.74]	[−1.45]
Cultural_relics		−7.78e − 08	−7.87e − 08	−7.12e − 08
		[−1.50]	[−1.50]	[−1.35]
Internet		−0.0000174	−0.00000748	−0.0000213
		[−0.49]	[−0.21]	[−0.58]
Pergdp		−0.0000115***	−0.0000120***	−0.0000113***
		[−4.91]	[−5.03]	[−4.71]
gdp3		0.00532	0.00560	0.00424
		[0.87]	[0.90]	[0.66]
Time fixed effect	Do not control	Do not control	Do not control	Do not control
Individual fixed effect	Do not control	Do not control	Do not control	Do not control
N	4785	4785	4785	4785
P	9.96e−22	5.24e − 36	3.96e − 37	1.10e − 36
chi2	91.72	179.1	—	—
F	—	—	31.38	24.18

It can be seen from Table 2 that in model (1) to model (4), the proportion of the population who has not gone to school has a significant positive impact on the TV program viewing share, which indicates that the educational structure of the population in different regions does have different effects. Regarding the audience share of the type of TV show, from the regression results of the full-sample data, the TV program audience share is more sensitive to changes in the proportion of the population who has not gone to school. For every 1% increase in the proportion of the population who has not gone to school, the TV program audience share will increase accordingly: 0.742%–1.244%. Next, this article will use the proportion of the population without going to school as an explanatory variable, and the share of TV shows as an explained variable into the regression model to conduct a robustness test. The results of the robustness test regression are shown in Table 3.

It can be seen from Table 3 that in model (1) to model (4), the proportion of the population who has not gone to school has a significant positive impact on the TV program broadcast share, which shows that the regression results in Table 2 are robust Yes; that is, the conclusion that the educational structure of the population has an impact on the share of TV program ratings is valid.

4.2. Grouped Sample Regression. There are certain differences in economic development, social customs, and distribution of educational resources in the eastern, central, and western regions. This may lead to differences in the impact of the educational structure of the population on the TV program ratings. Therefore, based on the full-sample regression data, this paper regressed the samples from the eastern, central, and western regions, respectively. The regression results of grouped samples in the eastern, central, and western regions are shown in Table 4.

It can be seen from Table 4 that the proportion of the population without going to school has a significant positive impact on the TV program ratings in the eastern, central, and western regions. This also further verified the robustness of the basic regression results. Among them, from the perspective of the size of the regression coefficient, the regression coefficient in the western region is the largest, followed by the central region, and the regression coefficient in the eastern region is the smallest. This shows that the educational structure of the population in the eastern, central, and western regions does have significant differences in its influence on the TV program audience share. Since the proportion of the population without going to school shows a sequential increase in the eastern, central, and western regions, the regression results in Table 5 further show that the larger the proportion of the population without going to school, the greater the share of TV program ratings, and the greater the impact.

The regression results of Tables 2 and 4 show that the share of TV program ratings is indeed affected by the educational structure of the population. Next, this article further explores how the educational structure of the population affects the viewing shares of different types of programs, so as to provide relevant enlightenment for each region to rationally arrange the share of TV programs and improve the efficiency of TV program supply according to the educational structure of the population. In order to facilitate the return of groups and eliminate the effects of other factors as much as possible, this article deletes programs that have a small viewing share and are specific to the target audience's age, gender, and educational background, including teaching, foreign languages, youth, music, and drama. There are six kinds of sports programs. After calculation, the remaining TV programs after the deletion account for about 85%–96% of the audience, which is very representative. According to program attributes, this article

Table 3: Robustness test regression results.

Model	(1)	(2)	(3)	(4)
Variables/statistics	Broadcast	Broadcast	Broadcast	Broadcast
Non	0.437***	0.475***	0.491***	0.361**
	[3.89]	[3.80]	[3.53]	[2.52]
Library		−0.00559**	−0.0164***	−0.0137***
		[−2.32]	[−3.57]	[−2.98]
Cultural_relics		−2.54e − 08	−1.27e − 08	9.24e − 10
		[−0.54]	[−0.27]	[0.02]
Internet		0.0000521*	0.0000688**	0.0000479
		[1.65]	[2.08]	[1.43]
Pergdp		−0.00000460**	−0.00000469**	−0.00000388*
		[−2.18]	[−2.16]	[−1.78]
gdp3		0.0155***	0.0175***	0.0121**
		[2.84]	[3.07]	[2.07]
Time fixed effect	Do not control	Do not control	Do not control	Control
Individual fixed effect	Do not control	Do not control	Do not control	Control
N	4785	4785	4785	4785
P	0.000101	0.000000540	2.84e−09	2.39e−13
chi2	15.12	39.62	—	—
F	—	—	8.562	9.649

Table 4: Regression results of grouped samples in the eastern, central, and western regions.

Area type	East area	Central region	Western region
Variables/statistics	Ratings	Ratings	Ratings
Non	0.663***	0.793**	0.898***
	[2.79]	[2.34]	[2.93]
Library	−0.0476*	−0.00313	−0.0222***
	[−1.89]	[−0.32]	[−2.97]
Cultural_relics	−0.000000113	−8.86e − 08	6.29e − 10
	[−1.15]	[−0.33]	[0.01]
Internet	0.0000430	0.000298**	0.0000436
	[0.71]	[2.58]	[0.42]
Pergdp	−0.00000788***	−0.0000283***	−0.0000147**
	[−2.68]	[−3.51]	[−2.49]
gdp3	−0.0234*	−0.00771	0.00803
	[−1.78]	[−0.51]	[0.70]
N	1815	1320	1650
p	6.92e − 18	0.000000141	3.75e − 14
F	15.94	7.212	12.81

divides these remaining TV programs into four categories: (1) movies, TV, and variety shows; (2) news, current affairs, and topics; (3) finance and legal system; (4) life services and others. On this basis, we will separately study the specific impact of the proportions of the population without schooling, elementary school, junior high school, high school, and junior college and the proportions of these five types of education on these four types of programs. Due to space limitations, only the regression coefficients and important statistics are reported below in this article. The sample regression results divided by program type and population educational structure are shown in Table 5.

It can be seen from Table 5 that the ratings of movies, TV series, and variety shows are not sensitive to changes in population educational structure, and the regression coefficients are not significant. Movies, TV series, and variety shows are rich and diverse, which can meet the various needs of different groups of people. And because the same program can be broadcast in different regions, different time periods, and multiple channels at the same time, the viewing time of the audience group is more flexible. To a certain extent, it explains why the educational structure of the population has no significant influence on the audience share of this type of TV program. Financial and legal programs are very sensitive to changes in the educational structure of the population. Among them, the proportion of the population with no schooling, elementary school, middle school, and high school education has a significant positive impact on its viewing share, and the proportion of the population with a college degree and above has a significant negative impact on its viewing share. The possible reason is that people with relatively low academic qualifications can broaden their

Table 5: Regression results of samples divided by program type and population educational structure.

Program type	Movies, TV series, and variety shows	News current events and topics	Finance and legal system	Life service and others
Variables/ statistics	Ratings	Ratings	Ratings	Ratings
Non	0.00566 [0.38]	−0.0673* [−1.78]	0.457*** [3.51]	0.0627** [2.09]
P *F* Primary	0.704 0.145 0.0277 [1.15]	0.0761 3.170 −0.106* [−1.73]	0.000521 12.34 0.736*** [3.48]	0.0377 4.363 0.145*** [3.00]
P *F* Junior	0.252 1.318 −0.0209 [−0.67]	0.0849 2.990 −0.154* [−1.93]	0.000591 12.09 1.198*** [4.43]	0.00292 9.025 0.230*** [3.69]
P *F* High	0.506 0.444 0.0100 [0.68]	0.0542 3.740 −0.0507 [−1.34]	0.0000137 19.64 0.381*** [2.92]	0.000268 13.64 0.0813*** [2.73]
P *F* College	0.500 0.457 −0.0122 [−1.28]	0.181 1.799 0.0580** [2.39]	0.00381 8.522 −0.383*** [−4.64]	0.00672 7.462 −0.0921*** [−4.93]
P *F*	0.203 1.630	0.0177 5.698	0.00000546 21.53	0.00000147 24.27

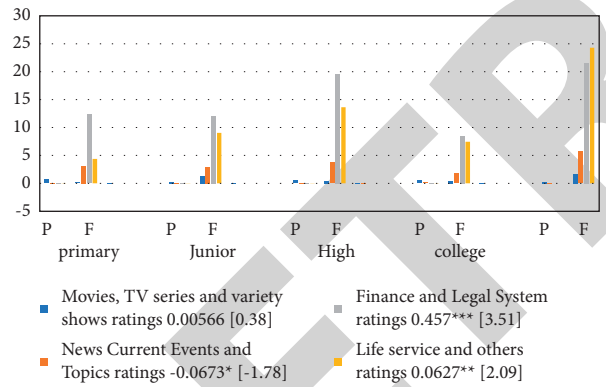

Figure 4: Regression results of samples.

horizons and inspire their thinking by watching financial and legal programs with common sense or popular science. Therefore, these people will have a certain degree of preference for such TV programs. For people with a college degree or above, because they have a relatively rich knowledge reserve, the common sense or popular science knowledge provided by financial and legal programs relatively lacks professionalism. They are more inclined to obtain the required knowledge or information through other channels than TV programs, so they show obvious nonpreference for such TV programs. In addition, the limitation of working hours may also be the reason why people with a college degree or above are less watching financial and legal programs.

The obvious nonpreference of the population with junior high school education and below towards news, current affairs, and special programs needs to be taken seriously. The population with a high school degree and below shows a clear preference for finance and legal system as well as life and service programs, while the population with a college degree and above shows nonpreference for finance and legal system. Life and service programs also need to be paid attention to.

4.3. Recapitulation. From Figure 4, we can compare the performance of the algorithm with benchmark study [33]. The study has also applied regression for better estimation based on their variable, and the results of the proposed study are better than the state of art if we consider the value of *P*.

5. Conclusion and Inspiration

The data on TV program ratings and broadcast shares show that there is a mismatch between supply and demand for TV programs. In view of this, this article starts with the educational structure of the population, combines the panel data of 29 provinces (cities, districts) from 2009 to 2019, and uses a panel regression model to study its impact on the TV program ratings share. The regression results show that, for the eastern, central, and western regions, the proportion of the population who has not gone to school has a significant positive impact on the TV program audience share, but from the regression coefficient, the western region is the largest, and the central region is the second. The east is the smallest. Further combining the characteristics of the average educational background of the population in these three regions, it can be seen that the larger the proportion of the population who has not gone to school, the greater the impact of its changes on the TV program audience share. In addition, the

sensitivity of various TV programs to changes in the proportion of the population with different educational backgrounds is also different. They are the least sensitive to changes in the proportion of the population who has not gone to school. Based on the above research, this article believes that each region should reasonably arrange TV programs in accordance with the educational structure of the population in the region and local conditions. From the perspective of program types, the focus should be on finance and legal system, life services, and other types of programs. TV programs of the same type should have a stepped feature in content arrangement, so as to meet the needs of people with different educational backgrounds as much as possible. Future work can check the result using deep learning neural network model.

Data Availability

The data are already included in the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

[1] A. Abdollahpouri, R. Qavami, and P. Moradi, "On the synthetic dataset generation for IPTV services based on user behavior," *Multimedia Tools and Applications*, vol. 77, no. 7, pp. 8475–8493, 2018.

[2] G. Li, "Towards predictive networking based on user interest mining," pp. 1–164, New York University Tandon School of Engineering, New York, NY, USA, 2020, Doctoral Dissertation.

[3] Y. Zhang, K. Meng, W. Kong, and Z. Y. Dong, "Collaborative filtering-based electricity plan recommender system," *IEEE Transactions on Industrial Informatics*, vol. 15, no. 3, pp. 1393–1404, 2018.

[4] C. K. Martin, S. M. Coulon, N. Markward, F. L. Greenway, and S. D. Anton, "Association between energy intake and viewing television, distractibility, and memory for advertisements," *The American Journal of Clinical Nutrition*, vol. 89, no. 1, pp. 37–44, 2009.

[5] F. T. Wilson, B. P. Schaefer, A. G. Blackburn, and H. Henderson, "Symbolically annihilating female police officer capabilities: cultivating gendered police use of force expectations?" *Women & Criminal Justice*, vol. 30, no. 4, pp. 1–20, 2019.

[6] C. M. Segijn, E. Maslowska, T. Araujo, and V. Viswanathan, "Engaging with TV events on Twitter: the interrelations between TV consumption, engagement actors, and engagement content," *Internet Research*, 2019, ahead-of-print(ahead-of-print).

[7] J. L. . Mcquivey, "Interactive TV rises again, pushed on by IPTV," *Forbes*, vol. 181, no. 13, pp. 115-116, 2018.

[8] P. Danaher and T. Dagger, "Using a nested logit model to forecast television ratings," *International Journal of Forecasting*, vol. 28, no. 3, pp. 607–622, 2017.

[9] D. Gensch and P. Shaman, "Predicting TV ratings." *Journal of Advertising Research*, vol. 20, no. 4, pp. 85–92, 2018.

[10] M. N. Lartz and S. K. Litchfield, "Administrators' ratings of competencies needed to prepare preservice teachers for oral deaf education programs," *American Annals of the Deaf*, vol. 150, no. 5, 2015.

[11] J. Roy and K. Adhikary, "A weighted interval rough number based method to determine relative importance ratings of customer requirements in QFD product planning," *Journal of Intelligent Manufacturing*, vol. 30, no. 1, pp. 3–16, 2019.

[12] A. Plp, C. Ltb, A. Mic, S. Becken, and J. Claudet, "Beauty and the reef: evaluating the use of non-expert ratings for monitoring aesthetic values of coral reefs," *The Science of the Total Environment*, vol. 730, 2020.

[13] D. J. Meyers, M. Rahman, I. B. Wilson, and V. Mor, "The relationship between medicare advantage star ratings and enrollee experience," *Journal of General Internal Medicine*, vol. 36, no. 22, 2021.

[14] M. Tsikandilakis, L. Kausel, G. Boncompte et al., ""There is No face like home": ratings for cultural familiarity to own and other facial dialects of emotion with and without conscious awareness in a British sample," *Perception*, vol. 48, no. 10, pp. 918–947, 2019.

[15] S. J. Hamstra, K. Yamazaki, M. A. Barton, S. A. Santen, M. S. Beeson, and E. S. Holmboe, "National study of longitudinal consistency in ACGME milestone ratings by clinical competency committees: exploring an aspect of validity in the assessment of residents' competence," *Academic Medicine*, vol. 94, no. 10, 2019.

[16] Y. Yan, Q. Hu, H. Liang, and M. Ni, "Adaptive temporal model for IPTV recommendation," in *Proceedings of the International Conference on Web-age Information Management*, Springer International Publishing, Qingdao, China, June 2015.

[17] X. Jie and H. Liang, "An expandable recommendation system on IPTV," in *Proceedings of the International conference swarm Intelligence*, June 2012.

[18] P. Cremonesi and R. Turrin, "Analysis of cold-start recommendations in IPTV systems," in *Proceedings of the Conference on Recommender Systems*, October 2009.

[19] J. Kim, E. Kwon, Y. Cho, and S. Kang, "Recommendation system of IPTV TV program using ontology and K-means clustering," in *Proceedings of the International Conference on Ubiquitous Computing and Multimedia Applications*, Springer Daejeon, Korea, April 2011.

[20] S. Witt, J. Bloemeke, M. Bullinger, J. Dingemann, M. Dellenmark Blom, and J. Quitmann, "Agreement between mothers', fathers', and children's' ratings on health-related quality of life in children born with esophageal atresia – a German cross-sectional study," *BMC Pediatrics*, vol. 19, 2019.

[21] G. Adomavicius, J. C. Bockstedt, and S. P. Curley, "Reducing recommender system biases: an investigation of rating display designs1," *MIS Quarterly*, vol. 43, no. 4, pp. 1321–1341, 2019.

[22] Y. Kachi, T. Kato, and I. Kawachi, "Socio-economic disparities in early childhood education enrollment: Japanese population-based study," *Journal of Epidemiology*, vol. 30, no. 3, 2020.

[23] H. M. Ko and J. Tsuei, "Tu1804 the mean age at colorectal cancer diagnosis is associated with level of education: a population-based national study," *Gastroenterology*, vol. 158, no. 6, pp. S–1168, 2020.

[24] D. Kim, M. D. Anne, G. H. Green et al., "Embedding population health in physical therapist professional education," *Physical Therapy*, vol. 52, no. 12, 2021.

[25] S. B. Johnson, M. A. Fair, L. D. Howley et al., "Teaching public and population health in medical education: an evaluation framework," *Academic Medicine*, vol. 95, no. 12, 2020.

[26] R. Morais, S. F. Bernardes, and P. Verdonk, "Gender awareness in medicine: adaptation and validation of the nijmegen gender awareness in medicine scale to the Portuguese population (N-gams)," *Advances in Health Sciences Education*, vol. 25, no. 3, 2020.

[27] T. A. Latvala, T. P. Lintonen, B. Matthew, R. Matthew, and H. S. Anne, "Social disadvantage and gambling severity: a population-based study with register-linkage," *The European Journal of Public Health*, vol. 31, no. 6, 2021.

[28] S. M. R. Hassani, R. Talebi, S. S. Pourdad, A. M. Naji, and F. Fayaz, "In-depth genome diversity, population structure and linkage disequilibrium analysis of worldwide diverse safflower (Carthamus tinctorius L.) accessions using NGS data generated by DArTseq technology," *Molecular Biology Reports*, vol. 47, no. 3, pp. 2123–2135, 2020.

[29] O. Astivia, A. Gadermann, and M. Guhn, "The relationship between statistical power and predictor distribution in multilevel logistic regression: a simulation-based approach," *BMC Medical Research Methodology*, vol. 19, no. 1, 2019.

[30] B. Oga, L. D. Gang, D. Wl, S. Dinggang, and R. Islem, "Multi-Regression based supervised sample selection for predicting baby connectome evolution trajectory from neonatal time-point - ScienceDirect," *Medical Image Analysis*, vol. 68, 2020.

[31] H. Shao, Y. Guo, G. Ding, and J. Han, "Zero-shot multi-label learning via label factorisation," *IET Computer Vision*, vol. 13, no. 2, 2019.

[32] K. Iba, T. Shinozaki, K. Maruo, and H. Noma, "Re-evaluation of the comparative effectiveness of bootstrap-based optimism correction methods in the development of multivariable clinical prediction models," *BMC Medical Research Methodology*, vol. 21, no. 1, 2021.

[33] A. F. Hayes and A. K. Montoya, "A tutorial on testing, visualizing, and probing an interaction involving a multicategorical variable in linear regression analysis," *Communication Methods and Measures*, vol. 11, no. 1, pp. 1–30, 2017.