

# A Study on the Different Characteristics for Information Consumption in Urban and Rural Residents -Focusing on China's Jilin Province-

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## 중국 도시·농촌 거주자의 정보소비 특성에 관한 연구 -중국 길림성을 중심으로-

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**Abstract** The purpose of this study is to investigate and evaluate the characteristics of information consumption between rural and urban residents. In this study, the data were collected through a survey and in-depth interview consisting of 121 information consumption questions for the residents of 15 cities and rural areas located in Jilin Province, China, and 985 effective responses were analyzed using SPSS 23.0. Analysis of information consumption characteristics by age, type of household and gender for urban and rural residents showed that there was a large interaction between age and gender, age and type of household, type of household and gender. This study can contribute to narrowing the information service gap between urban and rural residents and utilizing the potential of information consumption. The study is limited to analyzing only residents of Jilin Province in China and needs to expand the scope of future investigations.

**Key Words** : Information consumption, Analysis of variance, Rural residents, Urban residents, characteristics of information consumption

**요약** 본 연구의 목적은 농촌 주민과 도시 주민 간의 정보 소비의 특성을 조사하고 평가하는 것이다. 본 연구에서는 중국 길림성에 위치한 15개 도시와 농촌 지역 거주자에 대해 121개의 정보소비 문항으로 구성된 설문과 심층 인터뷰를 통해 데이터를 수집했으며, 985개의 유효 응답을 SPSS 23.0을 이용하여 분석하였다. 도시와 농촌 거주자를 대상으로 연령별, 가구형태 및 성별에 따른 정보소비 특성을 분석한 결과, 연령과 성별, 연령과 가구형태, 가족형태와 성별 사이에 상호작용이 큰 것을 알 수 있었다. 본 연구는 도시와 시골 주민들 사이의 정보 서비스 격차를 줄이고 정보 소비의 잠재력을 활용하는 데 기여할 수 있다. 이번 연구는 중국 길림성 주민만을 대상으로 분석했다는 한계가 있으며 향후 조사 범위를 확대할 필요가 있다.

**주제어** : 정보소비, 방차 분석, 농촌 주민, 도시 주민, 정보 소비특성

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## 1. Introduction

Internet, E-mail, SNS, mobile communications, artificial intelligence, 5G and other technologies are developing at a rapid pace[1]. China Internet Network Information Center(CNNIC) issued the 43rd statistical report on the development of China's Internet network on February 28, 2019. As of December 2018, China had 829 million Internet users, 56.53 million new Internet users and 59.6% Internet penetration rate, up 3.8% from the end of 2017. China's rural Internet users totaled 222 million, accounting for 26.7 percent of the total Internet users, an increase of 12.91 million from the end of 2017, with an annual growth the development and application of digital technology. The size of urban Internet users was 607 million, accounting for 73.3 percent, an increase of 43.62 million over the end of 2017, with an annual growth rate of 7.7 percent. Although the number of rural Internet users is less than that of urban Internet users, the number of rural Internet users increases year by year, the promotion effect that rural Internet users information consumption brings to national economy cannot ignore. Jilin Province is an old industrial zone and major grain-producing area. The total population of Jilin Province is 27.04 million, of which 11.48 million are rural, accounting for 42.47 percent of the total population of Jilin Province in 2019. Chinese rural population is about 600 million, with a total population of 1.4 billion. The rural population accounts for 42.86 percent. The proportion of rural population in Jilin Province is similar to that of China. In addition, the per capita net income of rural residents in Jilin Province is 13748 yuan, and the per capita living consumption expenditure is 10826 yuan in 2019. The per capita income of rural residents is 15,422 yuan and the per capita living expenditure is 12,934 yuan in China. Jilin Province is close to China's average. The income

and expenditure of rural residents in Jilin Province are close to the average in China. The population structure of rural and urban residents in Jilin Province is representative.

Through the development of digital technology and the use of technology, various devices have been developed that benefit the life of consumption[2]. In view of the research on the characteristics for subjects of information consumption, many scholars[3,4] had expounded it from the perspective of income, believed that the higher the income, the stronger the ability to pay, and the more information consumption expenditure. Other scholars[5-7] believed that different lifestyles and consumption habits would also lead to different characteristics for subjects of information consumption. However, there are few studies on the characteristics of information consumption subjects of different household types. There are two types of household registration in China. First is the rural household registration, which refers to people born in rural areas. Second is the urban household registration, refers to the people born in the town[8]. The theoretical value of this study is the comparative analysis of the characteristics of information consumption subjects reflected by different household registration types, different ages and different genders. The practical value of this study is to explore the differences between rural residents and urban residents in information consumption in Jilin Province, which is helpful to improve the information consumption domestic demands of these two groups respectively, and further improve the national information consumption ability

## 2. Theoretical review

### 2.1 A review of the concept of information consumption

The definition of information consumption was put forward later in China. Information consumption refers to per capita information consumption expenditure, including entertainment and culture, medical care, transportation and communication expenditure[9]. R. N. Geng(2018) believed that information consumer products intelligent content diversity, information consumption, information consumption scope of infiltration, information consumption new terminal, the health, education, transportation, family, culture, and a series of the wisdom of the people's livelihood public information consumption services applications, provide the public with pratt & Whitney, fast and efficient service, promotes the rapid growth of information consumption[10]. L. L. Fu (2014) believed that information consumers take consumption activities to meet their own information needs in a specific information consumption environment[11]. Y. L. Jiang (2018) believed that the object of information consumption in this study includes not only information products and services, but also information paid for with money or obtained for free. Information consumption also plays an important role in improving economic quality and efficiency[12]. Information consumption includes three major factors: subject, object and environment. Subject factor refers to information consumers, object factor refers to information products or services, and environmental factors include information network construction, information industry and information consumption policy[13]. Information consumption emphasizes the ultimate information consumer goods and services, including the transactions that consumers directly pay for to meet their information demands and the activities that consumers do not directly pay for but meet their information demands through the information platform built by enterprises or government agencies[14]. Information consumption begins with

information demand. Information demand is the driving force of information consumption and the essential element of information consumers[15]. Education level, household type and per capita income characteristics not only directly affect the level of information consumption, but also can affect residents' information consumption tendency through cross-level interactive effects[16].

Foreign scholars on the representative of information consumption: Marko J. van Leeuwen (2002) believed that, the information of consumers was analyzed from the perspective of receiving distance online education, and information consumption behaviors of consumers of different genders, ages and occupations were analyzed, so as to classify and compare the purpose, process and duration of various consumer information consumption behaviors[17]. Anne Hoag (2016) analyzed the factors affecting user cognition, and analyzed the process and consideration factors of consumers' choice in the face of new technologies, concepts or information. The evaluation system and satisfaction index system proposed have certain guiding significance and great application value in the field of information consumption[18]. Mark Lee Hunter(2018) proposed that online community comments have an important impact on consumption behavior of consumers, especially in the initial understanding of products, among which the consumer behavior of electronic products has the greatest impact[19].

## 2.2 A review of the characteristics for subjects of information consumption

Different scholars[3-7] have different research methods and contents on the characteristics for subjects of information consumption. The literature review is shown in Table 1.

Many scholars used the analysis of variance to

Table 1. Literature review on the characteristics for subjects of information consumption

Author (Year)	Name of document	Object of study	Research method	Research content
D.R.Zheng (2015)	Study on the characteristics and influence factors of online video information consumption in China	Information consumers	Analysis of variance	Information consumers are more male than female, the proportion of 10-39 years old is as high as 80%,the monthly income above 3000 yuan accounts for 40%.
Z.L.Xu (2019)	Research on consumer psychology and behavior in network marketing	Online consumers	Analysis of variance	The higher the income, the higher the network consumption and the higher the network dependence
L.M.Chao (2015)	Analysis of the characteristics of information consumption	Information consumers	Literature research	Information consumers are willing to share information
X.Y.Li (2017)	Study on characteristics of tourism information consumption of self-service tourists--based on content analysis	Self-service tourists	Social Network Analysis	Information consumers consume a wide range of types, and information processing ability is strong
X.M.Jiang (2018)	Information consumption characteristics of urban aging group	urban aging group	Analysis of variance	Information consumers mainly obtain life information and cultural information

do empirical research and analyzed the information consumption characteristics of different groups. However, among many research objects, there were very few researches on the comparison characteristics for subjects of information consumption behavior between urban residents and rural residents. This study makes up for this deficiency.

### 2.3 A review of the theory of analysis of variance

Analysis of Variance, also known as "Variance Analysis", invented by R. A. Fisher for the significance test of differences in the mean of two or more samples. Due to the influence of various factors, the data obtained in the study presented a fluctuation. The causes of the fluctuation can be divided into two categories: one is the uncontrollable random factors, and the other is the controllable factors exerted by the study to influence the results. Analysis of variance is one of the most important methods in scientific experiments and statistical analysis of data[20]. It is mainly used to analyze the changes of test result data and understand which factors have significant influence on indicators. Analysis of variance is divided into one-way analysis of variance and multi-factor analysis of variance[21]. One-way analysis of variance is used to compare the average values of multiple samples in a completely random design. Its

statistical inference is to infer whether the mean values of each population represented by each sample are equal. One-way analysis of variance is completed through examples[22]. The difference between the two is that not only each factor plays a role in the test indicators, but also the different horizontal collocation of each factor plays a role in the test indicators[23]. The structural equation model uses multi-factor analysis of variance as potential variables to control the measurement error, so the coefficient values estimated as bar bath using the structural equation model are more accurate than those obtained based on a specific variable[24].

Multi-factor analysis of variance can not only analyze the independent influence of multiple factors on the observed variables, but also analyze whether the interaction of multiple control factors has a significant impact on the distribution of observed variables, and finally find the optimal combination that is beneficial to the observed variables. In SPSS, the function of multi-factor analysis of variance can also be used to compare whether there is a significant difference in the mean value of the observed variables at different levels of the control variables. There are two ways to achieve this, namely, multiple comparison test and contrast test. The method of multiple comparison test is similar to that of one-way analysis of variance. The contrast test adopts the method of

one-sample t-test, which regards the values of the observed variables at different levels of the control variables as samples from different populations, and checks whether the mean of these populations is significantly different from a specified test value in turn.

Multi-factor analysis of variance is adopted in this study. Different levels of fixed age were used to explore the interaction between the household type and gender of urban residents and rural residents to obtain the mean value and standard deviation. The Levine test of homogeneity of variance was used to test whether the variances of two groups and more than two groups of independent samples were equal. SNK (Student-Newman-Keuls) test is used to verify

that the number of horizontal observations is equal[4].

### 3. Empirical analysis

#### 3.1 Questionnaire design and basis

This paper adopts questionnaire survey method to collect the data of empirical analysis. By consulting a large number of domestic and foreign literatures[2-7] related to information consumption, and by combining open questionnaire and in-depth interview, 121 questions of information consumption were finally formed to form the preliminary survey

**Table 2. Questionnaire contents and design basis**

Factors	Questions	Design basis
Information consumption demand	c83 I shop online.	W. L. Kuang.(2014). Analysis of users' weak information demand and service strategy in digital library. Y. Xie.(2013). Observation on the level of network information consumption of college students.
	c84 When shopping online, I look at the rate of good reviews.	
	c85 I move payment.	
	c89 When I shop online, I compare prices.	
	c92 Choosing an information product or service depends not only on price, but also on quality.	
	c94 I need startup information.	
	c100 I use baidu to look up information.	
	c101 When I shopping online, I read the product reviews.	
	c102 I use the online bank to pay for living expenses.	
	c114 When I shopping online, I look at the credibility of the goods.	
Information consumption ability to pay	c54 Paid information expands my knowledge.	Z. C. Yin & J. Wang. (2011). A grey system analysis of information payment ability of farmers in Hebei province.
	c58 Paid information can enrich my mind and improve my ability.	
	c63 Paid information can enrich my life.	
	c69 Paid information enables me to better communicate with others and promote interpersonal relationships.	
	c75 Paid information gives me access to healthy food information.	
	c76 Paid information allows me to know more about society.	
	c93 I pay with my mobile wallet.	
	c96 Paid information has improved the quality of my life.	
	c120 Paid information helps to let technology guide my future.	
Information consumption literacy	c6 I resist pirated software.	X. J. Wang. (2007). An Overview of Conceptual Information Literacy Both at Home and Abroad. D. Y. Sang. (2008). Review on Foreign Information Literacy Research.
	c10 Pirated software is of poor quality.	
	c27 Pirated software will make me lose a lot of information.	
	c37 Pirated software has viruses.	
	c45 Pirated software is not safe.	
	c47 I don't buy pirated software.	
c61 I don't use pirated software for lack of quality assurance.		

questionnaire. Likert 5 points were used to set the answers for each question, ranging from completely inconsistent to completely consistent. The samples formally tested came from 15 rural and urban areas of Jilin Province. A total of 1079 questionnaires were distributed through the two methods of on-site distribution and online distribution. 94 invalid questionnaires were deleted, and a total of 985 valid questionnaires were acquired, the effective rate was 91.3%. Dimensionality reduction was carried out on the data, and factors with low correlation degree were deleted to obtain the final component matrix of information consumption demand, payment ability and information literacy in three dimensions, a total of 26 factors. The questionnaire contents and design basis[25-29] are shown in Table 2.

Among the 985 valid samples, 332 were males, accounting for 33.7%, and 653 were females, accounting for 66.3%. In terms of age distribution, 167 people aged 19 and below (17.0%), 333 people aged 20-29 (33.8%), 190 people aged 30-39 (19.3%), 190 people aged 40-49 (19.3%), 86 people aged 50-59 (8.7%), and 19 people aged 60 or above (1.9%). In terms of educational background distribution, 243 people below senior high school, accounting for 24.7%. 99 people in junior college, accounting for 10.1%. 579 people with bachelor's degree, accounting for 58.8%, 64 people with master's degree or above, accounting for 6.5%. In terms of income range distribution, 734 people below 5000 yuan, accounting for 74.5%; 150 people between 5000 yuan and 8000 yuan, accounting for 15.2%; 41 people between 8001-10000 yuan, accounting for 4.2%; 60 people above 10000 yuan, accounting for 6.1%. In terms of household type distribution, there are 540 people in rural areas, accounting for 54.8%, and 445 people in urban areas, accounting for 45.2%. See Table 3.

**Table 3. Demographic characteristics**

Characteristics		Frequency	Percentage
Gender	Male	332	33.7
	Female	653	66.3
Age	19 and under	167	17.0
	20-29	333	33.8
	30-39	190	19.3
	40-49	190	19.3
	50-59	86	8.7
	60 and above	19	1.9
Education	High school and below	243	24.7
	Junior college	99	10.1
	University	579	58.8
	Master and above	64	6.1
Income range	Under 5000 yuan	734	74.5
	5000-8000	150	15.2
	8001-10000	41	4.2
	More than 10000 yuan	60	6.5
Place of residence	Rural area	540	54.8
	Town	445	45.2
Total		985	100

**Table 4. Levene's Test of Equality of Error Variances**

Levene Statistic					
Information consumption		Based on Mean	df1	df2	Sig
Information consumption	Based on Median	2.101	23	961	.002
	Based on Median and with adjusted df	1.554	23	961	.002
	Based on trimmed mean	1.554	23	733.916	.002

### 3.2 Analysis of variance

SPSS23.0 was used for reliability and validity test, and it was found that KMO=0.938, greater than 0.7, and Bartlett sphericity test was less than significance level, and the Alpha coefficient was 0.915, also greater than 0.7. According to the relevant criteria of KMO value and Bartlett sphericity test, as well as the criteria of factor load and the selection of explanatory ariants, the scale indexes reached the corresponding criteria. Therefore, this study can be judged to be reliable.

In this study, SPSS 23.0 was used to conduct multi-factor analysis of variance on 985 effective samples. Through the homogeneity of variance

**Table 5. Tests of Between-Subjects Effects**

Dependent Variable: Information consumption							
Source	Type III Sum of Squares	df	Mean Square	F	Sig.		
Corrected Model	5020.531	23	218.284	4.245	.000		
Intercept	543191.857	1	543191.857	10562.570	.000		
Age	1441.727	5	288.345	5.607	.000		
Household type	121.813	1	121.813	2.369	.124		
Gender	326.058	1	326.058	6.340	.012		
Age*Household type	441.971	5	88.394	1.719	.128		
Age*Gender	393.281	5	78.656	1.529	.178		
Household type *Gender	86.634	1	86.634	1.685	.195		
Age* Household type * Gender	488.812	5	97.762	1.901	.092		
Error	49420.488	961	51.426				
Total	1606453.000	985					
Corrected Total	54441.019	984					

a. R Squared = .092 (Adjusted R Squared = .070)

**Table 6. Student-Newman-Keuls**

Information consumption			
Student-Newman-Keuls a, b, c			
Age	N	Subset	
		1	2
60 and above	19	35.0526	
50-59	86	36.1279	
40-49	190		39.2263
30-39	190		39.4368
19 and under	167		40.4551
20-29	333		40.9129
Sig.		.370	.495

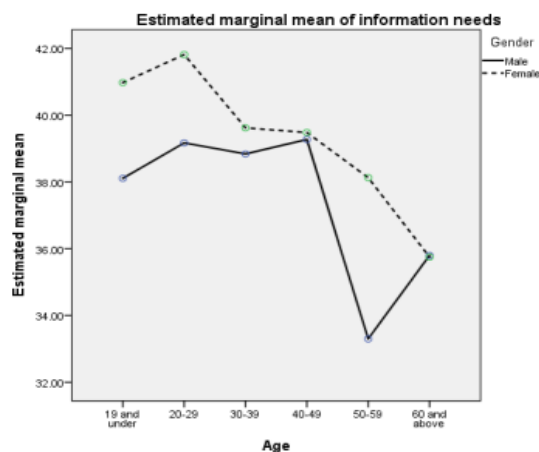
test, it can be seen that the values of df1 and df2 are both greater than 0.05 and the P value is less than 0.05, so the homogeneity of variance is shown in Table 4.

The grouping of age, gender and household type reflects the difference between different group data and the difference in their interaction. The modified model P value is less than 0.05, and the P value of age and gender is less than 0.05, indicating that there is a significant difference in information consumption demand between age and gender. See Table 5.

The SNK (student-newman-Keuls) method was used to group the ages, and it can be seen that, at the significant level of alpha =0.05, there was no difference between the age group aged 60 and above and the age group aged 50-59, and significant difference between 40-39, 30-39, 20-29 and the age group aged 19 and under. See Table 6.

Means for groups in homogeneous subsets are displayed. Based on observed means. Alpha = .05.

SPSS 23.0 analysis was used to obtain the estimated marginal mean, as shown in Table 7.



**Fig. 1. The Interaction between Age and Gender**

Table 7. Estimated marginal mean

Age * Household type * Gender						
Dependent variable: Information consumption						
Age	Household type	Gender	Mean	Std. Deviation	95% confidence interval	
					lower limit	upper limit
19 and under	Rural	Male	36.571	1.917	32.810	40.333
		Female	41.344	.918	39.542	43.146
	Urban	Male	39.643	1.917	35.882	43.404
		Female	40.603	.812	39.009	42.196
20-29	Rural	Male	39.638	.942	37.790	41.486
		Female	41.034	.587	39.881	42.186
	Urban	Male	38.700	1.134	36.475	40.925
		Female	42.593	.773	41.075	44.111
30-39	Rural	Male	37.375	1.268	34.887	39.863
		Female	37.000	.958	35.119	38.881
	Urban	Male	40.302	1.094	38.156	42.448
		Female	42.237	.934	40.405	44.069
40-49	Rural	Male	38.784	1.004	36.814	40.755
		Female	38.786	.857	37.104	40.468
	Urban	Male	39.759	1.332	37.145	42.372
		Female	40.175	1.134	37.950	42.400
50-59	Rural	Male	32.967	1.309	30.397	35.536
		Female	36.727	2.162	32.484	40.970
	Urban	Male	33.636	2.162	29.393	37.880
		Female	39.529	1.230	37.116	41.943
60 and above	Rural	Male	32.800	3.207	26.506	39.094
		Female	40.333	4.140	32.208	48.458
	Urban	Male	38.800	3.207	32.506	45.094
		Female	31.167	2.928	25.421	36.912

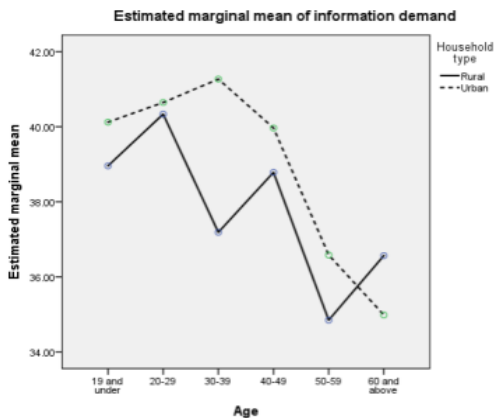


Fig. 2. The Interaction between Age and Household Type

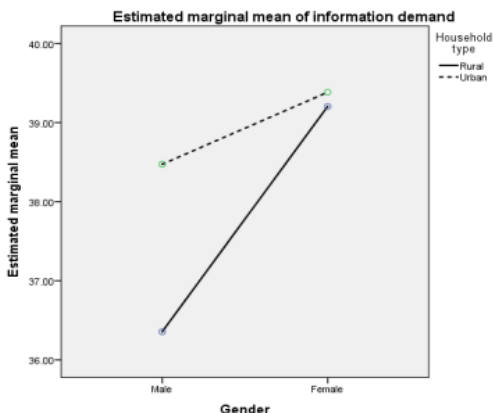


Fig. 3. The Interaction between Gender and Household Type

#### 4. Research results

Through the above empirical analysis, it can be seen that different age, household type and gender reflect different characteristics for subjects of information consumption. As shown in Fig. 1, it can be seen that at different age levels, with the growth of age, the information consumption behavior shows a downward trend, and the information consumption level of female is higher than that of male. Female aged 20-29 had the highest level of information consumption. The information consumption level of male aged 20-29 and 40-49 is high, while that of male aged 50-59 is very low. The information consumption level of male and female over 60 is basically the same. At different ages, the information consumption behavior shows a downward trend, and the information consumption level of urban residents is higher than that of rural residents. Among urban residents, 30-39 years old is the highest level of information consumption, and below 60 years old is the lowest level of information consumption. Among rural residents, 20-29 years



old is the highest level of information consumption, and 50-59 years old is the lowest level of information consumption. Below the age of 60, the information consumption level of urban residents is lower than that of rural residents, as shown in Fig. 2. At different gender levels, the information consumption level of female is higher than that of male. The information consumption level of urban residents is higher than that of rural residents, as shown in Fig. 3.

## 5. Conclusion

According to the above research, this study summarizes the different characteristics of information consumption behavior subjects in rural and urban residents in terms of age, gender and household type by using multi-factor analysis of variance, which has a great theoretical innovation for the characteristics of age and gender proposed by the previous scholars using one-way analysis of variance. According to these characteristics, the government of Jilin Province and the providers for information goods and service can provide corresponding information products and services for different characteristics of consumer groups, which has an important guiding significance for the construction and improvement of information infrastructure in Jilin Province, improving the awareness of information consumption, establishing the subsidy policy system of agricultural information service, improving the popularization rate of information facilities, improving the efficiency of rural information supply and narrowing the gap between urban and rural areas.

However, there are some limitations in this study. Firstly, due to the late rise of information consumption in rural areas, there is a lot of lack of relevant statistical data in the annals. Therefore, it is difficult to obtain the macro data

of information consumption, which makes the difficulty to analysis of this paper in depth at the macro level. Secondly, the data samples in this paper are all from Jilin Province, which have distinct characteristics of Jilin Province residents and are significantly affected by the regional economic level, so that these samples can not fully represent the overall information consumption level of China.

With the popularization and apply of the Internet, the use of information technology and information consumption behavior have gradually become a means of production and production, and information resources will become an important factor of production long into the future. As a result, it will be a new research direction in the future by using various research methods comprehensively, which can deepen the utilization and breadth of data, enrich and improve the original data, increase the scientific analysis, and then analyze the impact of information consumption on the production, life and welfare of rural and urban residents in depth.

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