

Household Income, Education Level, and Television-Viewing Frequency—A Quantitative Economic Analysis

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Abstract: Based on the 2015 China General Social Survey data, this empirical study examines the socioeconomic factors influencing individuals' television-viewing frequency. The empirical results reveal that the impact of household income and education level on television viewing frequency transitions from positive to negative as household income increases. With an increase in household income and education level, the frequency of television viewing of individuals from the lowest income group increased, while those from the highest income group experience a decrease. Additionally, the empirical findings suggest an age-related impact on television viewing interest, where younger individuals exhibit less interest in watching television, suggesting a decline in television viewing as a leisure activity.

Keywords: Household Income, Education Level, Television Viewing Frequency, Quantitative Economic Analysis

1. Introduction

China's productivity has steadily increased after 40 years of reform and opening-up. As people's basic needs, such as clothing, food, housing, transportation, healthcare, and education, continue to be met at higher levels, there has been a growing focus on and pursuit of leisurely lifestyles. Simultaneously, the government, industries, and businesses have been continuously creating diverse leisure activities to meet the demands of the population. Despite these developments, the 2015 China General Social Survey (referred to as CGSS2015 hereafter) indicates that watching television remains the most prevalent and frequent leisure activity among the Chinese population. This observation is further supported by the 2018 National Time Use Survey Report, which also reveals a preference for television viewing among lower-income individuals.

The popularity of television among the Chinese population can be attributed to several factors. Firstly, television is favored due to its low cost. From a direct cost perspective, considering the durability of televisions, the purchase cost is negligible. Additionally, the energy consumption cost of television is relatively low, accounting for a low proportion of the income. Secondly, watching television does not require high cultural sophistication, making it accessible to a wide audience. However, when considering the opportunity cost of watching television, which refers to the benefits or utility that could be obtained from engaging in other activities during that time, as well as the expanded range of leisure choices resulting from increased household income and education levels, it can be inferred that the influence of household income and education level on television viewing habits among the Chinese population varies across different income levels.

The remaining sections of this paper will be organized as follows; Section 2 will provide a review of relevant literature and present the hypotheses that need to be examined; Section 3 will define the variables and establish a multiple linear regression model to explain the frequency of watching television; Section 4 will utilize the CGSS2015 dataset to conduct regression analysis on the model, exploring the changes in the impact of household income and education level on the frequency of television viewing across different income levels. This will allow for the testing of the hypotheses; Section 5 will summarize the findings and discuss the results obtained from the regression analysis.

2. Literature Review and Research Hypotheses

Apart from literature exploring the relationship between television viewing habits and specific diseases or health conditions from a medical and health management perspective, the existing research on television viewing rates, both domestically and internationally, primarily focuses on the field of leisure sociology (economics).

Robinson and Converse (1972) argued that watching television significantly reduces Americans' time for sleep, meals, reading, watching movies, exercising, playing cards, dancing, and engaging in church activities^[1]. Wilson (1980) estimated that out of Americans' four hours of leisure time, 1.5 hours are spent watching television^[2]. Robinson (1977) pointed out that watching television is the most popular secondary activity, as people often engage in other tasks while watching television^[3]. Ladinsky and Wells (1977) suggested that the poor are less likely to have stable employment and thus have less stable leisure time. Due to their limited financial resources, they purchase fewer leisure goods and have fewer leisure opportunities. Although the poor also spend significant time watching television, socializing remains the primary activity in low-income communities^[4]. Frey, Benesch, and Stutzer (2007) estimated that in 1995, the average American spent 16 hours per week or 2.5 hours per day watching television^[5]. In the 2002/2003 European Social Survey, 20% of respondents reported spending more than 3 hours per day watching television^[5]. The long-term negative effects of excessive television viewing are more pronounced for individuals with high opportunity costs than those with low opportunity costs. This results in individuals with high opportunity cost spending less time watching television daily^[5].

Since the early 1990s, leisure activities have become a subject of attention in Chinese society. Huang Zhijian (1994) pointed out that watching television ranked second among the leisure activities of young people^[6]. Wang Qiyuan (2000), analyzing how urban residents allocate their time, stated that watching television is the primary factor influencing the allocation of time among urban residents on rest days and workdays^[7]. Hu Zhijian et al. (2003) found that males watch television longer than females, and the older the age group, the longer the television viewing time. The age group of 55-59 had the longest television viewing time, and individuals with lower educational levels spent less time watching television^[8]. Ma Guansheng et al. (2006) analyzed the television viewing time of Chinese residents using data from the 2002 China National Nutrition and Health Survey. They found that among all age groups, the 18-45 age group had the highest proportion of television viewers, reaching 95.2%. The average daily television viewing time for television viewers was 2.1 hours^[9].

This paper infers that individuals with different income levels exhibit different television viewing habits. Therefore, based on household income, this study examines the variations in the impact of socioeconomic variables such as household income and education level on television viewing rates. By examining these differences, the study aims to understand how household income and education level influence the propensity to watch television across different income groups.

This study will test the following two hypotheses:

HI: In the lowest income group, the television-viewing frequency increases as household income rises. Conversely, in the highest income group, the television-viewing frequency decreases as household income increases.

III: In the lowest income group, the television-viewing frequency increases as the education level rises. However, in the highest income group, the television-viewing frequency decreases as the education level increases.

3. Data, Variables, and Model

The CGSS2015 survey had a set of questions (A30): "Over the past year, have you frequently engaged in the following activities during your leisure time?" One specific question, A3001, inquired about the frequency of watching television or DVDs. Both watching television and DVDs serve as means of leisure and entertainment. Given that television programs cover a wide range of content largely replicated on DVDs, DVDs can be seen as a medium for redistributing television content. Therefore, we consider the A3001 question in the CGSS2015 survey to be an investigation into individuals' television viewing activities.

Each activity has five frequency options: 1—daily, 2—several times a week, 3—several times a month, 4—several times a year or less, and 5—never. With a mean value of 1.55, watching television becomes the most frequent leisure activity. We recorded variable A3001 as follows: 1—never, 2—several

times a year or less, 3—several times a month, 4—several times a week, and 5—daily, generating an explanatory variable "fre" to measure the frequency of television viewing among respondents. We selected household income and education level as socioeconomic attributes of the respondents while introducing gender, ethnicity, and age variables to control for demographic characteristics. Variable A62 in CGSS2015 asked about the respondents' total annual household income in the previous year, from which we generated the household income variable "hi" to measure respondents' affordability and opportunity costs of leisure activities. Variable A7a asked about the respondent's highest level of education, with 13 levels ranging from no education to graduate or above. We assigned a value of 1 for no education and 13 for graduate or above, generating the education level variable "edu." We centered the education level variable within age groups using group means to eliminate the effect of education inflation and ensure comparability across respondents. A431 asked respondents to choose their social class, with 10 levels from lower class to upper class. We assigned a value of 1 for the lower class and 10 for the upper class, creating the variable "class" to measure respondents' subjective social stratification. A2 recorded respondents' gender, from which we generated the gender variable "gender" with a value of 1 for males. A4 recorded respondents' ethnicity, and we generated the ethnicity variable "ethnicity" with a value of 1 for the Han ethnicity. A301 recorded the respondents' birth year, and by subtracting it from 2015, we obtained the respondents' age. We divided the age into eight groups representing those born before the 1930s, born in the 1930s, born in the 1940s, born in the 1950s, born in the 1970s, born in the 1980s, born in the 1990s, and born in the 1960s. This resulted in the creation of eight age variables named age1, age2, age3, age4, age5, age6, age7, and age8

The names, meanings, and properties of the variables are shown in Table 1.

Table 1: Model Variables

Name		Meaning	Property
fre	Explained Variable	Television-viewing Frequency	Ordinal Data, range 1-5
hi	Core Explanatory Variable	Household Income	Interval Data
class		Subjective Social Class	Ordinal Data, range 1-10
gender		Gender	Binary Variable, 1=male
ethnicity		Ethnicity	Binary Variable, 1=Han
age1	Control Group	Age Group 1	Binary Variable: 1=Born before the 1930s
age2		Age Group 2	Binary Variable: 1=Born in the 1930s
age3		Age Group 3	Binary Variable: 1=Born in the 1940s
age4		Age Group 4	Binary Variable: 1=Born in the 1950s
age5		Age Group 5	Binary Variable: 1=Born in the 1970s
age6		Age Group 6	Binary Variable: 1=Born in the 1980s
age7		Age Group 7	Binary Variable: 1=Born in the 1990s
age8		Age Base Group	Binary Variable: 1=Born in the 1960s

To distinguish the patterns of television viewing habits among different income groups, we categorize household income into five tiers: the bottom tier (first 20% of household income), the lower-middle tier (second 20% of household income), the middle tier (third 20% of household income), the upper-middle tier (fourth 20% of household income), and the top tier (fifth 20% of household income).

After defining variables and cleaning data, a total of 10,265 valid samples were obtained.

The descriptive statistical characteristics of the variables are shown in Table 2.

Table 2: Variable Descriptive Statistics

Variable	Sample Size	Mean/Proportion	Standard Deviation
fre	10265	4.38	1.02
hi	2053	Lowest level: 7563.486	4974.58
	2053	Second-lowest level: 25096.67	4634.597
	2053	Middle Level: 44909.67	5846.132
	2053	Second-highest level: 69934.31	7360.941
	2053	Highest level: 218318.2	629720.1
edu	10265	4.29e-08	2.73175
class	10265	4.311252	1.639005
gender	10265	46.99%	n.a
ethnicity	10265	92.19%	
age1	10265	1.05%	
age2	10265	6.16%	
age3	10265	13.24%	
age4	10265	19.48%	
age5	10265	17.28%	
age6	10265	13.47%	
age7	10265	8.70%	
age8	10265	20.62%	

The television-viewing frequency of the i -th respondent is determined by Equation (1).

$$fre_i = \beta_0 + \beta_j age_{ij} + \beta_8 * gender_i + \beta_9 * ethnicity_i + \beta_{10} * hi_i + \beta_{11} * edu_i + \beta_{12} * class_i + \mu_{i,j} \quad j = 1,2 \dots 7 \quad (1)$$

4. Regression Results

Stata15 is used to perform regression on equation (1). Considering the potential presence of heteroscedasticity, the robust standard error is used.

Table 3 and Table 4 display the regression results of television viewing frequencies for individuals in the bottom and top income groups.

Table 3: Regression results of television viewing frequency for the bottom income group

<i>fre</i>	Coefficient	Standard Deviation	T value	P value	Significance Level
<i>age1</i>	-1.093	0.294	-3.72	0.000	***
<i>age2</i>	-0.506	0.115	-4.41	0.000	***
<i>age3</i>	-0.111	0.077	-1.44	0.149	
<i>age4</i>	-0.060	0.070	-0.85	0.393	
<i>age5</i>	0.047	0.080	0.59	0.554	
<i>age6</i>	-0.190	0.121	-1.57	0.116	
<i>age7</i>	-0.565	0.141	-4.02	0.000	***
<i>gender</i>	0.017	0.053	0.32	0.747	
<i>nation</i>	-0.072	0.083	-0.87	0.386	
<i>hi</i>	0.00002	0.000	4.65	0.000	***
<i>edu</i>	0.038	0.016	2.32	0.021	**
<i>class</i>	0.052	0.016	3.33	0.001	***
<i>cons</i>	4.123	0.118	35.07	0.000	***
Mean dependent var	4.264		SD dependent var	1.180	
R-squared	0.056		Number of obs	2053.000	
F-test	8.080		Prob > F	0.000	
Akaike crit. (AIC)	6412.848		Bayesian crit. (BIC)	6486.000	

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Regression results of television viewing frequency for top income group

<i>fre</i>	Coefficient	Standard Deviation	T value	P value	Significance Level
<i>age1</i>	0.148	0.169	0.88	0.381	
<i>age2</i>	0.189	0.097	1.94	0.052	*
<i>age3</i>	0.051	0.083	0.61	0.540	
<i>age4</i>	0.152	0.062	2.44	0.015	**
<i>age5</i>	-0.409	0.067	-6.09	0.000	***
<i>age6</i>	-0.433	0.066	-6.56	0.000	***
<i>age7</i>	-0.758	0.088	-8.63	0.000	***
<i>gender</i>	-0.041	0.044	-0.93	0.354	
<i>ethnicity</i>	0.008	0.096	0.09	0.932	
<i>hi</i>	-6.30e-08	0.000	-2.53	0.012	**
<i>edu</i>	-0.025	0.007	-3.51	0.000	***
<i>class</i>	0.010	0.016	0.60	0.549	
<i>cons</i>	4.557	0.134	33.99	0.000	***
Mean dependent var	4.292		SD dependent var	1.026	
R-squared	0.094		Number of obs	2053.000	
F-test	18.097		Prob > F	0.000	
Akaike crit. (AIC)	5755.217		Bayesian crit. (BIC)	5828.368	

*** p<0.01, ** p<0.05, * p<0.1

Both hypotheses passed the test. The impact of household income on television viewing frequency transitions from being positive and statistically significant to negative and statistically significant across different income levels. Similarly, the effect of education level on the frequency of watching television also changes from positive and significant to negative and significant. As shown in Table 3, in the bottom income group, the coefficient for "hi" is 0.00002, and it passes the significance test at the 5% level, strongly supporting the inference that as household income increases, the frequency of watching television increases. As shown in Table 4, the coefficient for "hi" is negative and passes the significance test at the 5% level, supporting the inference that as household income increases, the frequency of watching television decreases. The relationship between education level and television viewing frequency demonstrates divergent patterns at the two ends of the income spectrum. As shown in Table 3, in the bottom income level, the coefficient for "edu" is 0.038, and it passes the significance test at the 5%

level, supporting the inference that the frequency of watching television increases with higher education levels. As shown in Table 4, in the top income group, the coefficient for "edu" is -0.025, and it passes the significance test at the 5% level, supporting the inference that the frequency of watching television decreases with higher education levels.

5. Conclusions and Discussions

The hypotheses we proposed in the second part of this article were tested. In the bottom income level, household income and education level have a positive and significant impact on television-viewing frequency. In the top income level, both variables have a negative and significant impact on the television-viewing frequency. One possible reason is that in higher income levels, education level replaces household income as the main factor influencing people's choice of leisure activities. As education level increases, individuals are more inclined to engage in culturally enriching leisure activities instead of watching television. Additionally, they may seek leisure activities that offer more social interactions or allow them to showcase their identities.

Television programs have become increasingly diverse, with each channel of CCTV highlighting its distinctive programs and delivering content precisely targeted to the audience. For example, the Agricultural Channel's program "Agriculture and Farming" interprets rural economic development from the perspective of ordinary people, exploring the experiences and practices of hard work and wealth creation, stimulating the thinking of rural viewers about the path to prosperity. The comprehensive channel's "Everlasting Classics" program inherits classical poetry through musical performances, offering viewers the combined pleasure of music and literature. Under its influence and guidance, a group of children and adolescents embark on the path of inheriting Chinese traditional culture. However, the regression results show an age effect indicating that "the younger, the less inclined to watch television," suggesting the inevitable decline of television as a leisure activity. At the same time, we noticed a phenomenon: among respondents who chose television as their primary source of information according to the A29 question in CGSS2015, the frequency of watching television for these respondents is 4.61, very close to watching television every day and higher than the mean for the entire sample. Moreover, 70.50% of respondents who watch television several times a week or daily primarily obtain information through television. This, to some extent, indicates that television's leisure and entertainment aspect has been overshadowed by its role as an information source.

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