A Survey of College Students' Attitudes towards Negative News during the Epidemic Period

QianHui You

Sun Yat-sen Universityl, Guangzhou, Guangdong, 510000, China

*Corresponding author. Email: 2305962044@qq.com

Abstract. His paper collects relevant information through questionnaires, and uses one-way ANOVA to analyze college students' attitudes towards the negative news during the epidemic, and whether the negative news has an impact on college students' psychology is related to gender. Finally, it is concluded that raising or maintaining the original attention to social negative news may cause college students' anxiety caused by paying too much attention to the negative news and there is no significant gender difference in the overall average of male and female students' emotional anxiety caused by seeing the negative news. This paper takes the current social situation as the background and social hot spots as the research object, which plays an important role in clarifying the relationship between the new crown epidemic and people's anxiety, and is conducive to improving people's physical and mental health in the context of the epidemic. Meanwhile, this paper provides relevant basis for the government to formulate policies in the post-epidemic era, which are conducive to maintaining social order and promoting the benign development of society. Finally, this paper also shows the feasibility of applying relevant mathematical tools to economic and social research practice, which is conducive to people's more efficient understanding of some social phenomena. Proficiency in using these tools is also one of the ultimate goals of our learning.

Keywords: Epidemic; gender; negative news; anxiety

1   Introduction

Since the outbreak of the epidemic in 2019, the country has implemented an epidemic prevention policy of precise prevention and control and sticking to dynamic zero clearing. During the three-year epidemic period from 2019 to the present, the main relevant information was disseminated to the public through the Internet, media and other media. In this process, there is no lack of some related negative news presented to the public. As a new youth in the new era, contemporary college students are also one of the groups that use and contact the Internet media most, and the relevant information they receive is more diverse and complex, with good and bad mixed.

In this network society with high-speed and developed information, many media report some social cases in an exaggerated way and without pursuing the truth of the

news. To a certain extent, this has aroused social attention, discussion and even panic. A considerable number of followers have published false information, fabricated rumors and believed rumours on the Internet, which have had a negative impact on society.

In such a special stage, college students, as a firm reserve group of social forces, are in a period when the three concepts have not been truly completed. In addition, college students also have to experience many conflicts between individuals and groups during this period, such as the adaptation to new learning environment and tasks, the adaptation to professional selection and learning, the conflict between ideal and reality, the handling and learning of interpersonal relationships and the choice of future careers, etc.

The anxiety caused by the above-mentioned factors is the biggest influencing factor of the psychological status of college students at present. [1] Therefore, this survey analyzes the two influencing variables of gender and the degree of attention paid to the news related to the epidemic, and investigates whether the negative news of the epidemic will cause differences in the degree of psychological impact on college students. The purpose of the study is to explore the factors and degree of social negative news on college students' psychology.

2   Hypothesis research and reasons

2.1   Hypothetical reasons

Since the outbreak of the epidemic in 2019, the frequency of negative news covering various areas has been significantly higher than that during the non-epidemic period. As the receivers of all kinds of negative news, people's attention to the negative news has increased to a certain extent under this special epidemic situation, which inevitably brings anxiety to people. There are stereotypes that individuals of different genders may differ in the degree of anxiety. However, due to the fact that people under the epidemic are a general social group, we think that gender differences have little impact on the attention and anxiety of negative news, that is to say, we think that men's and women's willingness to pay attention to negative news and the degree of anxiety generated by negative news are equal.

2.2   Hypothetical process

We hypothesized that gender had nothing to do with individual anxiety about negative news during the epidemic.

H0: The general average of male and female students' anxiety about seeing negative news is equal.

Ha: The general average of male and female students' emotional anxiety about seeing negative news is not equal.

The number of choices expressing anxiety in the questionnaire is quantified as 1, 2, 3 and 4 for analysis. We assume that gender has nothing to do with the degree of change in individuals' attention to negative news during the epidemic.

H0: Male and female students have the same level of attention to the negative news after the epidemic.

Ha: Male and female students have different overall mean changes in their attention to the negative news after the epidemic.

Quantify the choices in the questionnaire indicating the degree of change as numbers 1, 2, 3, 4 and 5 for analysis.

2.3   Hypothetical reasons

Since the outbreak of the epidemic in 2019, in order to achieve better epidemic prevention effect, the government has made the latest news of the epidemic fully public. People want to increase their understanding of the current situation of the epidemic as much as possible, which will increase their attention to the news and even lead to pathological manifestations of excessive attention to negative news. The public have unexpected worries about the epidemic prevention and control work, resulting in anxiety. According to relevant statistics, more than 90 million anxiety patients have been added globally since the outbreak of the COVID-19 epidemic. Therefore, we believe that raising attention to negative social news during the epidemic period will cause anxiety.

2.4   Hypothetical process

We assume that increasing attention to negative social news during the epidemic will cause anxiety.

H0: Too much attention to social news leads to anxiety. It is independent of the frequency of social news.

Ha: Too much attention to social news leads to anxiety. It is not independent of the frequency of social news.

In the questionnaire, the options "always occurring", "frequently occurring" and "rarely occurring" were combined into anxiety, and the option "never" was no anxiety.

3   Data collection

The survey was conducted through the form of anonymous questionnaires distributed on the Internet [2]. The questionnaires were mainly distributed to students' communication groups and friends groups on the platform. The survey was mainly aimed at full-time college students of the groups. 280 questionnaires were obtained, among which 280 were valid, with an effective rate of 100%.

4   Data analysis

Based on the hypothetical content, we used the collected data to study whether the anxiety degree of negative information and news attention degree of college students of different genders are the same. In this experiment, there is only one qualitative factor

(gender) that affects the response variable (anxiety level), so we consider using one-way ANOVA.

4.1 Analysis process

In order to test whether the original hypothesis H0 holds, appropriate test statistics need to be calculated first. We assume that a simple sample with a capacity of nj (nj = 57,223) is taken from k(k=2) populations. Xij represents the I-th observation for the J-th treatment; nj represents the number of observations for the J-th treatment; Represents the mean value of the sample processed j; sj2 represents the sample variance for the J-th treatment; sj represents the standard deviation of the sample for the J-th treatment.$\bar{x}_j$

$$\overline{x}_j = \frac{\sum_{i=1}^{n_j} x_{ij}}{x_j} \tag{1}$$

$$s_j^2 = \frac{\sum_{i=1}^{n_j} (x_{ij} - \overline{x}_j)^2}{n_j - 1} \tag{2}$$

The mean value of the total sample is equal to the sum of all observations divided by the total number of observations (nT=n1+…+nk): [3]

$$\overline{\overline{x}} = \frac{\sum_{i=1}^{k} \sum_{i=1}^{n_j} x_{ij}}{n_T} \tag{3}$$

In order to construct the test statistics, three sum of squares of errors are first calculated: sum of squares of errors (SST), sum of squares of processing (SSTR) and sum of squares of errors (SSE): [4]

$$SST = \sum_{j=1}^{k} \sum_{i=1}^{n_j} \left(x_{ij} - \overline{\overline{x}} \right)^2 \tag{4}$$

$$SSTR = \sum_{j=1}^{k} n_j \left(\overline{x}_j - \overline{\overline{x}} \right)^2 \tag{5}$$

$$SSE \sum_{j=1}^{k} (n_j - 1) s_j^2 \qquad (6)$$

The relationship between them is SST=SSTR+SSE. We then calculate the overall inter-process estimate (MSTR) and intra-process estimate (MSE):

$$MSTR = \frac{SSTR}{k-1} \qquad (7)$$

$$MSE = \frac{SSE}{n_T - k} \qquad (8)$$

We note that MSTR is based on estimates between the mean values of the samples themselves, while MSE is based on the variability of the data within each sample. In other words, if the original assumption is not true, the mean values of k populations are not equal, then MSTR is not an σ^2 unbiased estimate and it will overestimate the population variance σ^2; The MSE is not affected by the original assumption.

If the original assumption is true, for normal population, the sampling distribution of MSTR/MSE follows an F distribution with a numerator degree of freedom of k-1 and a denominator degree of freedom of nt-k. [5]

However, if the original assumption is not true, because MSTR overestimates the population variance, the obtained MSTR/MSE value is too large to be like an F distribution with a numerator degree of freedom of k-1 and a denominator degree of freedom of nT-k, we will reject H0.

$$F = \frac{MSTR}{MSE} \qquad (9)$$

4.2   Hypothesis testing

Based on the hypothetical content, we collated the recovery data by gender. Since only one qualitative factor (gender) affects the response variable in this experiment, we consider using F-test to perform one-way ANOVA and express the calculation results with Excel data tables.

(1) Is gender related to individual anxiety about negative news?.
The original hypothesis is H0: the average of male and female students' emotional anxiety about seeing negative news is equal.

Alternative hypothesis Ha: The general average of male and female students' emotional anxiety about seeing negative news is not equal.

As the question in the questionnaire is "whether there is a phenomenon of anxiety and panic caused by paying too much attention to social news", the options are: 1. never 2. occasionally 3. frequently 4. always, so we quantify the options as numbers of 1, 2, 3 and 4 for analysis.

We used the information about "anxiety level" in the questionnaire as the sample information about the difference between male and female students about the degree of emotional anxiety caused by seeing negative news, and tested the hypothesis under the significance level of α =0.05.

To test H0, we calculated the following tables using Excel.

Table 1. H0(1) Test Results

SUMMARY						
group	Number of observations	sue for peace	average	variance		
man	57	60	1.052632	0.37218		
woman	223	274	1.2287	0.384398		
source of difference	SS	df	MS	F	P-value	F crit
interblock	1.407286	one	1.407286	3.684605	0.05594	3.875126
within group	106.1784	278	0.381937			
Total	107.5857	279				

It can be seen from the table1 that if the p- value is ≥ α =0.05, H0 cannot be rejected. Therefore, the general average of male and female students' emotional anxiety about seeing negative news is equal, that is to say, there is no significant gender difference.

(2) Is gender related to the degree of change in individuals' attention to negative news after the epidemic?.

The original assumption is H0: the general average of boys' and girls' attention to the negative news after the epidemic is equal.

Alternative hypothesis Ha: The general average of boys and girls' attention to the negative news after the epidemic is not equal.

As the question in the questionnaire is "Is the attention paid to social media negative news during the epidemic period higher than during the non-epidemic period?", the options are: 1. significant increase 2. slight increase 3. no effect 4. slight decrease 5. significant decrease, so we quantify the options as numbers of 1, 2, 3, 4 and 5 for analysis. [6]

We used the information about "negative news attention" in the questionnaire settings as the data basis to determine whether the social media negative news attention during the epidemic period was higher than that during the non-epidemic period, and tested the hypothesis under the significance level of α =0.05.

To test H0, we calculated the following tables using Excel.

Table 2. H0(2) Test Results

SUMMARY							
group	Number of observations	sue for peace	average	variance			
man	57	110	1.929825	0.637845			
woman	223	441	1.977578	0.625621			
Variance analysis							
Source of difference	SS	df	MS	F	P-value	F crit	
interblock	0.103524	one	0.103524	0.164825	0.685065	3.875126	
Within group	174.6072	278	0.628083				
Total	174.7107	279					

It can be seen from the table2 that if p- value $\geqslant$ α =0.05, H0 cannot be rejected. It can be seen from this that the sample average of male and female students' attention to social media negative news during the epidemic period is the same, so there is no significant gender difference.

(3) It is assumed that increasing attention to negative social news during the epidemic will cause anxiety？.

Table 3. Sample data on whether excessive attention to negative news causes anxiety and whether news attention is increased (observation frequency)

Media attention to negative news during the epidemic Is it higher than during non-epidemic period	Does Excessive Attention to Negative News Lead to Anxiety		total
	anxious	Not anxious	
raise	206	13	219
No impact	45	8	53
reduce	4	4	8
total	255	25	280

Table 4. Expected frequency when excessive attention to negative news causes anxiety and news attention increases independence

Media attention to negative news during the epidemic Is it higher than during non-epidemic period	Does Excessive Attention to Negative News Lead to Anxiety		total
	anxious	Not anxious	
raise	199.4464286	19.55357143	219
No impact	48.26785714	4.732142857	53
reduce	0.714285714	4	8
total	255	25	280

In order to test the validity of the original hypothesis H0, it is necessary to simply process the variables and calculate appropriate statistics.[7] We assume that a simple sample with a capacity of nj (nj=280) is taken from k populations (k=1). ri represents the data in row i of the table and cj represents the data in column j of the table. fij is the observed frequency for row I and column j, and eij is the expected frequency for row I and column j. ($eij=\frac{ri\times cj}{nj}$) We summarize the data in Table 3 and Table 4.

The χ2 test is used to determine whether excessive attention to social news causes anxiety and is independent of the frequency of social news attention.[8]

$$\chi2 =\sum_i \sum_j \frac{(fij-eij)^2}{eij}$$

Calculation of obtaining test statistic χ2:

Table 5. Calculation of test statistic χ2 on whether excessive attention to negative news causes anxiety and whether news attention improves

Media attention to negative news during the epidemic Is it higher than non-epidemic period	Excessive attention to negative news Does it lead to anxiety	Observation frequency (fij)	Expected frequency (eij)	Diference (fij-eij)	Square of difference (fij-eij) 2	The square of the difference divided by the expected frequency (fij-eij) 2/eij
raise	anxious	206	199.4464286	6.553571429	42.94929847	0.21534253
raise	Not anxious	13	19.55357143	-6.55357143	42.9492984	2.196493803
No impact	anxious	45	48.26785714	-3.26785714	10.67889031	0.22124227
No impact	Not anxious	eight	4.732142857	3.267857143	10.67889031	2.256671159
reduce	anxious	four	7.285714286	-3.28571429	10.79591837	1.481792717
reduce	Not anxious	four	0.714285714	3.285714286	10.79591837	15.11428571
	total	280	280			χ2=21.48582819

We further processed the data in Table 3 and Table 4 and summarized them into Table 5 for the calculation of obtaining test statistic χ2:

Degree of freedom $=2(r-1)\times(c-1)$

From the table, χ2=21.48582519

For α=0.05 and degree of freedom 2, the critical value of test statistic χ2 is χ2=5.991. Since 21.48582519≥5.991, we reject H0. It can be seen that paying too much attention to social news makes one feel anxious, which is not independent of the frequency of social news.

Further, for α=0.01 and degree of freedom of 2, the critical value of test statistic χ2 is χ2=9.210. Since 21.48582519≥9.210, we reject H0. It can be seen that paying too

much attention to social news makes one feel anxious, which is not independent of the frequency of social news.

On the basis that excessive attention to social news causes anxiety and the frequency of social news attention is not independent, the probability of whether excessive attention to social news causes anxiety is calculated respectively under the frequency of social news attention, and the following calculation results are obtained:

Table 6. The probability of whether excessive attention to social news causes anxiety is calculated respectively under the frequency of social news attention while the frequency of social news attention is not independent

Media attention to negative news during the epidemic Is it higher than during non-epidemic period	anxious	Not anxious
raise	94.06%	5.94%
No impact	84.91%	15.09%
reduce	50.00%	50.00%

From the table 6 , it is known that increasing or maintaining the original attention to social negative news during the epidemic period may cause college students to become anxious because they pay too much attention to the negative news.

5 Conclusion

5.1 Findings

From the 5.1 hypothesis analysis, it can be known that the general average of male and female students' emotional anxiety about seeing negative news is equal, and the sample average of increasing attention to social media negative news during the epidemic period is the same, with no significant gender difference.

The analysis based on the 5.2 hypothesis can increase or maintain the original attention to social negative news during the epidemic period, which may cause college students to become anxious due to excessive attention to negative news.

5.2 Research Significance and Enlightenment

The negative news of the epidemic has indeed had great and small impact on contemporary college students. Among them, there are many news media people who have lost their professional ethics. Without being confirmed by the official news, they make up stories and scare stories in order to seize the marketing opportunities. However, after such false news spread quickly again and again, the official media did not keep up with the speed and intensity of the rumor spreading, which led to a decline in the credibility and appeal of some official media, which also caused the negative news to have a deeper negative impact on the psychology of college students.

As a generation with knowledge, college students should think and judge rationally. Most college students pay more attention to the information related to the epidemic. For the information they receive every day, they should "listen to all things, but listen to all things, but listen to none". They do not blindly believe in any kind of consultation. [9]They learn to analyze the information from a dialectical point of view and are used to eliminating the adverse effects of false information on our psychological state from the root. This also reduces people's attention to unscrupulous media from another angle, which is also beneficial to eliminate them in the market atmosphere of "flow is the king".

At the same time, the official media can also make changes from the aspects of efficiency and dissemination scope, so as to improve and stabilize the credibility of the official media and prevent the masses from panic caused by rumors. In the information age, building a healthy social communication atmosphere requires all of us to make efforts.

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