

# The Influence of The Quantitative Relationship Between Bad and Positive Online Reviews on Consumers' Willingness to Shop Online

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**Abstract.** Online shopping evaluation is one of the important decisions for consumers to do online shopping. The negative comments in the evaluation have an important impact on consumers in shopping. Based on the product classification theory, this paper classifies the products consumers mainly buy on online shopping platforms into five major categories: daily necessities, educational and sporting goods, home appliances and digital products, food, and clothing accessories, and serves as a moderating factor. The hypothesis is that the number of negative reviews about logistics and transportation would negatively affect consumers' willingness to purchase daily necessities and food. The number of bad reviews about merchants' services would negatively affect consumers' purchase intention for apparel accessories. The number of bad reviews about products that would negatively affect consumers' willingness to purchase digital home appliances and educational and sporting goods online was proposed. A questionnaire was used to obtain the sample data of consumers' online shopping intention, and SPSS was used to test its reliability with different analyses and correlation analyses. Based on the correlation between the content and the number of negative reviews, it showed that six or more negative reviews for food products significantly affect consumers' willingness to purchase. The number of negative reviews about merchant services for daily necessities and the product for clothing accessories significantly affects consumers' willingness to purchase. Furthermore, for all types of products, when the number of negative reviews increases, consumers need to increase their willingness to purchase with more positive reviews. Among them, consumers' occupation, average monthly consumption level, and length of exposure to online shopping moderate the credibility of consumers' judgment of negative reviews. In conclusion, it is concluded that Taobao merchants should pay attention to the content and quantity in negative reviews, improve the quality of products, services, logistics, and transportation from the consumers' point of view, and improve the competitiveness of their products for better online marketing.

**Keywords:** Quantitative relationship; Online reviews; Consumers' willingness; Shop online.

## 1. Introduction

Changes in interpersonal communication and interaction have spurred the creation of new media and information transmission strategies in network-based social media. Due to the convenience, interactivity, and transparency of the online transaction model, which has won the favour of merchants and customers and brought them closer together, the Internet's pervasiveness has led to a rise in the use of online shopping platforms by consumers. By the end of 2021, the number of Chinese online shoppers will reach 842 million, representing 81.6% of the Internet population. Due to the information asymmetry between consumers and merchants, internet shopping reviews have become one of the most relied upon by consumers when making decisions, and individuals describe their experiences with products in a symbolic manner. Conceptually, this consumer behaviour is known as "online information evaluation." Particularly, online information evaluation relates to the social psychological perspective and perceived usefulness of products and services offered by customers, as well as the behaviour of filling out and submitting consumer evaluations in the comment section

of online buying platforms. The reviews play an active role in the online purchasing behaviour of consumers by providing recommendations for future customers' consumption decisions and attracting new customers to the businesses. On the one hand, buyers can obtain accurate information about the merchant's services and prices to make more informed purchasing decisions. On the other hand, consumer reviews are an important reference for merchants to improve the quality of their products and services and continuously enhance the competitiveness of their brands; consequently, merchants pay special attention to consumer reviews after the sale to increase brand awareness and consumption. In conclusion, user reviews directly impact the public's perception of a product, ultimately influencing consumer purchasing decisions. To summarise, this paper will examine the impact of negative user reviews on consumers' online shopping decisions. This paper will provide a more targeted approach for online platforms and online merchants in different industries in terms of products, services, logistics, and transportation by studying the impact of the content and number of negative reviews on consumers' online shopping decisions, as well as the moderating effect of different product types. This article offers a more targeted approach to product, service, logistics, and transportation improvement for online merchants in various industries.

## 2. Theoretical and literature background

### 2.1 Literature

The attitudes and opinions of others influence consumers' shopping decisions and behavior, and word-of-mouth is among the most important influences [1]. Based on Westbrook's definition of word-of-mouth [2], big data scholars categorize user reviews as IWOM when studying online user reviews. User reviews are informative, widely dispersed, storable, and anonymous [3], and it is an important decision factor for users of different age groups when purchasing goods online [4].

Many scholars have researched and analyzed the role of user reviews in influencing consumers' purchase decisions. The currently dominant approach to IWOM research is to classify it as either positive or negative. Negative IWOM is defined by Riehins [5] and Singh and Jagdip [6] et al. as consumer complaints about products or services and dissatisfaction related to shopping. According to Amdt [7], Meijer, and Kleinnijenhui [8], negative word-of-mouth influences consumers' decisions more than positive ones.

Consumers' online shopping decisions are greatly influenced by the quantity, quality, timeliness, and validity of reviews, as well as the reputation of reviewers [9-10]. Anderson & Salisbury [11] suggested that the number of user reviews evokes consumers' attention to the product and thus changes their perceptions of it. According to Park et al. [12], online user reviews are persuasive due to the quality and quantity of their information, and the proportion of negative user reviews suggests that an increase in negative reviews affects consumers' attitudes toward the product.

Many scholars have studied the effectiveness of user reviews in the context of consumers' online shopping processes. The quality of user reviews influences consumers' purchasing decisions. Dellarocas & Naraya, and Otterbacher identified factors that influence the usefulness of user reviews based on product attributes, consumer characteristics, and other measures [13-14]. Moreover, Siering et al. suggested that longer reviews contain more information about the product or service and are more helpful to consumers when making online purchase decisions [15]. Additionally, consumers' dissatisfaction with online shopping results has many causes, including product quality and packaging problems, courier delivery issues, and difficulties with merchant service attitudes [16].

Researchers have also conducted a significant amount of academic research regarding the moderating effect of different product types on the impact of user reviews. Mudambi and Sehuff found that extreme reviews were less effective at influencing consumer decisions for experiential products than unbiased reviews [17]. Song Yuanzheng found that negative online reviews with different contents had a distinct influence on consumers' online purchase decisions when they purchased search-based or experience-based products online [18]. Peterson, Balasubramanian, and

Bronnenberg developed a new classification criterion based on three dimensions: the cost and frequency of purchase, the value proposition, and the degree of differentiation between products [19].

## 2.2 Theories

### 2.2.1 Prospect Theory

Kahneman and Amos Tversky suggest that People are divided into two stages in the decision-making process, the first stage is the occurrence of random events and the collection and organization of practical results and related information, and the second stage is evaluation and decision-making. To assess the need for decision-making, people usually pre-process time during the first stage, including the integration and simplification of information. In a consumer's decision-making process, aversion and avoidance of risk and loss are important factors that influence information search and decision-making. Since human rationality is limited, people do not try to calculate the true value of an item when making decisions but use easier-to-evaluate cues to judge. This means that when consumers make online purchase decisions, negative reviews serve as a risk information cue for possible losses and are a risk-averse and avoid state compared to positive reviews. Consumers pay more attention to such reviews and may find negative reviews more useful.

### 2.2.2 Motivation theory of purchasing behavior

The concept of motivation views motivation as an intrinsic drive that determines behavior. Motivation is generally divided into two types of conditions: internal conditions are needs, external conditions are triggers, and needs are in a state of arousal to drive individuals to act. Common motives for consumer buying behavior are truth-seeking, fame-seeking, cheapness-seeking, convenience-seeking, and hobby motivation.

The realistic motive refers to consumers' tendency to pursue the use value of goods or services as the dominant purchase motive and pay more attention to the quality and efficacy of goods when purchasing goods, requiring goods to be economical and durable and not emphasizing the novelty of the style of goods, whether they can show their personality, status, etc. When consumers buy necessities, they pay more attention to the actual utility and functional quality of the goods.

The motive of seeking fame refers to the consumers' motive of purchasing famous brands and high-grade goods to show and improve their status, and they pay more attention to the trademark and brand name of goods when purchasing goods. The popularity and advertising of goods influence them more. Driven by this motivation, consumers buy goods almost regardless of the price of goods and the actual value of use, just by buying, using brand-name, high-end goods to show their status and position, from which a psychological satisfaction.

The cheap motive refers to the main goal of consumers to use cheap goods as the main purchase motive, mainly expressed in purchasing a particular commodity. The price of consumers pays special attention to their limited income to spend on more products.

Convenience motivation refers to the consumers pursuing the process of purchasing and use of goods to save time, with convenience as the dominant tendency. Such consumers pay more attention to time and efficiency, are not picky about the goods themselves, hope to buy the desired, suitable goods quickly, hate the hassle of buying, have too long a waiting time and have low sales efficiency.

Hobby motivation refers to consumers' regular purchase of certain products due to their hobbies, habits, or professions, and this type of purchase behavior is concentrated, stable and frequent. This type of consumer buying activity is stereotyped. For example, people with hobbies of stamp collecting, fishing, collecting, and flower raising always purchase a particular type of goods that are related to them continuously.

### 2.2.3 Construal level theory

The explanation theory is that the level of explanation of individual things varies with psychological distance, affecting the individual's cognitive activities such as judging, predicting, and evaluating things [20]. The explanation can help people in social activities to let others understand the meaning behind a certain behavior [21]. And explaining this behavior is closely tied to Attribution

theory, reveals the logical relationship between events and why things change for themselves and others [22], and on this basis, helps people predict behavior and outcomes. The act of explanation is closely linked to evaluation and attribution [23].

#### 2.2.4 Product classification theory

Using different product classification criteria can lead to different findings in consumer behavior research, increase research rigor, and better explain the findings. A series of scholars have interpreted product classification criteria from different perspectives.

Nelson (1974) classified products into search and experience products according to their search and experience attributes and pointed out that some products can be both search and experience products [24].

Norton (1988) further classifies experiential products into persistent experiential products and non-persistent experiential goods according to the frequency of product purchase [25].

Batra&Ahtola (1990) Point out that products can be divided into functional and hedonic products according to needs [26].

Lal & Sarvary (1998) Point out that products can be divided into tangible and intangible products [27]. In addition, Degeratu (2000) proposed that products can be classified into sensory and non-sensory products based on whether the product attributes can be communicated through perception [28].

Darby & Karni (1973), based on Norton (1988), divided products into search, experience-based, and trust products, which are difficult to evaluate or obtain information about, either before or after purchase. Klatzky (1991) classified products into geometric, material-based, and mechanical products according to the judgment criteria of consumer evaluation [29-30].

Based on the frequency of purchase dimension and value proposition demension proposed by Petersonon etc. [19], Lian & Lin (2008) investigated the influence of consumer characteristics on the acceptance of online purchases based on whether consumers purchase low-priced frequent purchase products and high-priced infrequent purchase products, supporting the rationality of such product segmentation [19].

Based on the above product classification theory, this paper selects daily necessities, education and sports goods, home appliances and digital products, and food, clothing, and accessories as the product classification factors for this study.

### 2.3 Method

This paper collects sample data on consumers' willingness to shop online by distributing questionnaires and aims to design an online questionnaire through Questionnaire Star, consisting of two parts. Likert scale questions on consumers' essential characteristics and feelings regarding online reviews and the completion of the answer sheet are expected to take approximately two to three minutes. The questionnaire survey will be conducted 1 week after November 11, 2022, mainly to investigate and count the online shopping behavior and willingness of young and middle-aged consumers in various regions of China after the annual e-commerce promotion day Double Eleven.

It is planned to distribute 270 questionnaires, and 250 valid questionnaires are expected to be achieved after the subsequent identification of invalid questionnaires, such as those with more blanks, more single repeated options, or more extreme options. According to the valid questionnaire sample data results, SPSS was used to test the reliability and validity of the questionnaire. According to the test results, factor analysis was conducted on the basic characteristics of consumers, online shopping behavior, and online shopping intention scale of the questionnaire accordingly, and the variables of different dimensions were summarized. Then the basic characteristics, online shopping behavior of different tendencies, and the content and quantitative relationship of bad reviews were tested. The independent variables are bad reviews of the product itself, bad reviews of the logistics, bad reviews of the merchant's service, and the number of positive follow-up reviews. The dependent variable is the value of consumers' willingness to purchase, and the moderating variable is the five types of products. In addition, we also analyzed the differences in the content and number of bad reviews and

different purchase intentions under different product types by combining different consumer characteristics tests.

### **2.3.1 Basic characteristics and behavior analysis**

As the questionnaire includes questions related to basic consumer characteristics, such as gender, age, and occupation, the non-numerical questions were first analyzed and summarized by frequency.

### **2.3.2 Reliability test**

Cronbach's alpha coefficient reliability test tested the reliability of the questionnaire, and a higher alpha coefficient represents a higher internal consistency among the questions.

### **2.3.3 Validity test and index categorization**

Once the background information and basic behavioral characteristics of the questionnaire have been analyzed, the research variables will be analyzed. Factor analysis is used to classify data into dimensions and analyze the correspondence between question items and dimensions. KMO and Bartlett sphere tests are used to determine the suitability of using factor analysis before conducting exploratory factor analysis (EFA) to verify the correspondence between the questions and factors and expected agreement. The data results with good validity are formed when the topic-factor correspondence is good.

### **2.3.4 Variance Analysis**

Because there are different types of consumers, such as gender, age, and other different groups of attitudes to questionnaire items in differential dimensions, it is proposed that a significant amount of preference variability is present in different dimensions. Based on ANOVA and a cross-tabulation analysis of key hypothesis-related variables will be used to test the relationship between different variables.

### **2.3.5 Correlation analysis**

After analyzing the different dimensions of the data, the variables in the sample were analyzed descriptively, and their correlation was tested to determine the presence and confidentiality of the relationship.

### **2.3.6 Regression analysis**

A regression analysis was used to test the independent factor for the number and content of negative reviews and the dependent factor for consumers' purchase intentions. Firstly, the model situation was analyzed. It was proposed to use multiple regression analysis to show that the independent variables have an influential relationship with the dependent variable through F-test. After this, the significance of the independent variables was determined, and insignificant variables were excluded. Combined with the regression coefficient B value, the degree of influence of the independent variables on the dependent variable is compared and analyzed.

## **2.4 Hypotheses**

Based on the product classification papers, this paper selects digital home appliances among the higher-priced durable goods and daily necessities among the low-priced consumables purchased frequently. Cultural, educational and sporting goods among the entertainment products within the selected range of the types of products consumers buy online, and also add the clothing accessories they often buy online according to the suggestions of many consumers when the questionnaire was distributed. According to Weidan's analysis, the structure of food consumption of Chinese residents has changed dramatically, and residents' food consumption behavior is guided by consumer psychology [31]. According to Wang Keshan, online food shopping has become an important channel for consumers to buy food [32]. Therefore, this paper adds food as a category of goods option in this study.

Hypothesis 1 The number of negative reviews about transportation has a negative impact on consumers' willingness to purchase daily necessities and food.

This paper argues that daily necessities are sustainable and highly consumable. Because consumers buy them frequently, they tend to choose lower-priced goods due to cheap motives and risk-averse psychology. Meanwhile, they are reducing their requirements for quality and service but concentrating on the speed and quality of transportation since they want to get it at the expected time.

People usually concentrate on food sanitation and safety when they pick goods, and more and more people like to buy pre-made food. The in-house Economy has People become more indoors, and lazy to get out, and the quantity of ready-to-eat food saw year on year rise of 111% [33]. Transportation of food becomes very important to ensure the quality of food hygiene and fast enough. The number of bad reviews about transportation will affect consumers' willingness to buy food to avoid unknown risks during transit.

Hypothesis 2 The number of bad reviews about merchant services will have a negative impact on consumers' purchase intention on clothing accessories.

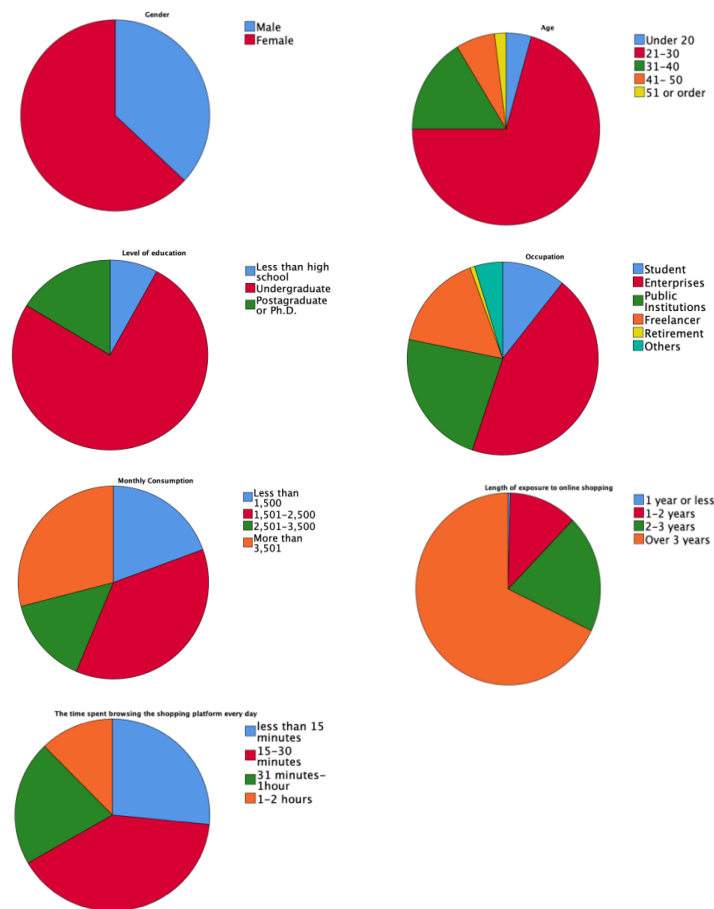
Meanwhile, when people pick up clothing accessories online, they concentrate on the online store's layout and picture of dress collection to match their sense of beauty, and talk with merchants to get more details and suggestions [34]. Consequently, the number of bad reviews about merchant services will affect their willingness to buy clothing accessories.

Hypothesis 3 the number of bad reviews on products will have a negative impact on consumers' willingness to buy digital home appliances and cultural, educational, and sporting supplies online.

Based on the fact that online platforms recently consumer-oriented design platforms, consumers place more emphasis on satisfying their own needs when searching for and selecting goods, and the customer will have higher requirements for the quality of products. Digital home appliances, durable products on daily life, are considered mostly more serviceable and used for a long time. Therefore, the increase in the number of bad reviews on the product about the product itself will increase the risk of consumers' purchase.

### 3. Results

In this paper, the Questionnaire Star Application analyzed the questionnaire, which required questions designed to avoid blank and incomplete questionnaires. The questionnaires were distributed on multiple network platforms, and a total of 252 questionnaires were collected. According to the preliminary analysis and summary of the demographic characteristics of the questionnaire, this study found that there were 93 male students in the survey, which represents 36.9%, and 63.1% of the samples were female. People's age is mainly 21-30 years old for 70.6%, followed by 31-40 years old. More than 90% of undergraduates are in the samples and 93% of employees, freelancers, and students. The average monthly consumption of less than 50% is less than 2,500 yuan, and the monthly consumption of more than 3,501 yuan is 29%; Only 0.4% of people have been online shopping for less than 1 year, and the rest have been online shopping for more than 1 year. A third of online shoppers spend more than 30 minutes per day browsing shopping platforms, while 26.6% spend less than 15 minutes browsing, as shown in Figure 1.



**Fig 1.** the Summary of Frequency Distribution inPie Charts of Questionnaire Sample (Photo credit: Original)

**Table 1.** Frequence Distribution of Choose Reason

Questions	Selected Choices	N	Percent
Main reasons for choosing online shopping	Platform promotion	49	19.40%
	Great variety of goods	52	20.60%
	High-cost performance	47	18.70%
	Convenient and quick, save time	73	29.00%
	Others	31	12.30%
Attractions when choosing goods in online shopping	Brands	74	29.40%
	Platform promotion advertising	46	18.30%
	Recommended by relatives and friends around	39	15.50%
	Recommendation by social media influencer	24	9.50%
	Self-use experience	69	27.40%
Goods mainly focused on and purchased	Daily necessities	84	33.30%
	Cultural, educational and sporting supplies	23	9.10%
	Clothing accessories	40	15.90%
	Food	48	19.00%
	Clothing accessories	57	22.60%
Total		252	100.00%

According to Table 1, in this sample, most people choose online shopping because of its convenience and high efficiency. Simultaneously, they are usually attracted by the brand and their experience with products. This paper analyzes five commodity categories: daily necessities, cultural, educational, and sporting supplies, digital home appliances, food, and clothing accessories based on the questionnaire design and the actual data collection. During the Double Eleven promotion, daily necessities and clothing accessories are first purchased, accounting for more than 50%.

### 3.1 Daily necessities

In this survey, 117 people chose daily necessities, of whom 33 were men, accounting for 28.2%, and 84 women, accounting for 71.8%. Regarding age distribution, 79 people aged 21-30 make up 67.5%, followed by 31- 40, at 15.4%. Additionally, 67.5% of respondents have a college degree, and most are employed by companies or institutions or are students. It is estimated that 42.7% of the population spends more than 3,500 yuan per month, while the average monthly consumption is over 1,500 yuan. In general, more than 80% of the people have been involved in online shopping for more than three years, and they have a basic understanding of its operation.

**Table 2.** Reliability Statistic Results of Daily necessities

Dimensionality	Cronbach's Alpha	N of Items
daily necessities	0.849	13
Negative reviews about products	0.857	4
Negative reviews about transportation	0.804	2
Negative reviews about merchant services	0.801	3
The number of positive reviews to covering 1 negative review	0.923	4

**Table 3.** Validity Examination Results of Daily necessities

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.783
Bartlett's Test of Sphericity	Approx. Chi-Square	1044.008
	df	78
	Sig.	.000

According to Table 2 and Table 3, for the daily necessities, Cronbach's Alpha is 0.849, and all dimensions are greater than 0.7, indicating good internal consistency and reliability. After the validity test and adjusting some questions combined with the research content, the test result of KMO is 0.783, greater than 0.6, Sig. is less than 0.5, and this survey is suitable for continuing analysis.

**Table 4.** Significant Difference Analysis Results of Occupation in Sample of Daily Necessities purchase intention

Variables	Occupation	N	Mean	Std. Deviation	Std. Error	F	Sig.
The number of negative reviews on transportation	Student	17	0.237	1.314	0.319	2.381	0.043
	Enterprises	58	-0.064	0.809	0.106		
	Public Institutions	17	-0.534	1.064	0.258		
	Freelancer	14	0.141	1.042	0.279		
	Retirement	2	1.153	0.272	0.192		
	Others	9	0.501	0.969	0.323		

**Table 5.** Significant Difference Analysis Results of Monthly Consumption in Sample of Daily Necessities purchase intention

Variables	Monthly Consumption	N	Mean	Std. Deviation	Std. Error	F	Sig.
The number of negative reviews on merchant services	Less than 1,500	15	- 0.528	0.839	0.217	3.031	0.032
	1,501-2,500	29	- 0.225	0.964	0.179		
	2,501-3,500	23	0.260	0.784	0.164		
	More than 3,501	50	0.169	1.087	0.154		

**Table 6.** Significant Difference Analysis Results of the Length of Exposure to Online Shopping in Sample of Daily Necessities purchase intention

Variables	The Length of Exposure to Online Shopping	N	Mean	Std. Deviation	Std. Error	F	Sig.
The number of negative reviews on products	1-2 years	4	- 0.913	0.707	0.354	3.092	0.049
	2-3 years	14	- 0.365	0.761	0.203		
	Over 3 years	99	0.088	1.015	0.102		

In Table 5-Table 7, According to the variance analysis, Since the significant difference analysis results of Sig. are small than 0.05, The monthly consumption is related to negative reviews of merchant services, the occupation is related to negative reviews on transportation, and the length of exposure to online shopping is related to negative reviews on products.

**Table 7.** Correlation Coefficient Matrix for Mainly Variables

Variables	Transportations reviews	Product reviews	Merchant reviews	Positive reviews covering
Transportation reviews	1			
Product reviews	.421**	1		
Merchant reviews	.412**	.564**	1	
Positive reviews covering	0.153	0.11	.204*	1

According to Table 7, the correlation test results, negative reviews on products, transportation, and merchant services are positively weak correlated since the Pearson correlation coefficient is smaller than 0.7. Still, positive review coverage numbers are not related to other negative reviews, so daily necessities are less likely to analyze regression.

### 3.2 Cultural, educational, and sporting supplies

A total of 32 respondents chose cultural, educational, and sporting supplies, of whom 16 were men, accounting for 10%, and the same number of women. The age distribution shows that 20 people aged 21-30 constitute 62.5%, followed by 31-40. Furthermore, 87.5% of respondents possess a college degree, and public institutions and businesses employ the majority. On average, 71.9% of the population spends less than 2,500 yuan per month. Overall, 59.4% of people have been involved in online shopping for less than three years. Of those who have been shopping online for more than 30 minutes, 96.9% have a basic understanding of how it works.

**Table 8.** Reliability Statistic Results of Cultural, educational, and sporting supplies

Dimensionality	Cronbach's Alpha	N of Items
Cultural, educational, and sporting supplies	0.894	16
Negative reviews about products	0.727	4
Negative reviews about transportation	0.556	4
Negative reviews about merchant services	0.731	4
The number of positive reviews to cover 1 negative review	0.703	4

According to Table 8, for the stationery and educational supplies sample, there is no KMO value, and exploratory factor analysis cannot be conducted. There is a possibility that the sample size is too small. Data correlation needs to be improved by increasing the sample size.

### 3.3 Clothing accessories

The survey included 92 people, of which 25 were men, representing 27.2%, and 67 were women, representing 72.8%. Regarding age distribution, 70 people aged 21-30 make up 76.1%, followed by 31-40 as 10.9%. Further, 69.6% of respondents have a college degree, and most work for private enterprises 34.8%, followed by public institutions and students 18.5%. Approximately 47.8% of the population spends less than 2,500 yuan per month. More than 70% of people have been shopping online for more than three years, and 89% spend less than one-hour browsing online shopping platforms. The majority of them have a basic understanding of its operation.

**Table 9.** Reliability Statistic Results of Clothing accessories

Dimensionality	Cronbach's Alpha	N of Items
Clothing accessories	0.879	10
Negative reviews about products	0.746	4
Negative reviews about merchant services and transportation	0.819	2
The number of positive reviews to cover 1 negative review	0.915	4

**Table 10.** Validity Examination Results of Clothing accessories

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.800
Bartlett's Test of Sphericity	Approx. Chi-Square	521.254
	df	45
	Sig.	0.000

According to Table 9 and Table 10, for the clothing accessories, after the validity test and adjusting some questions combined with the research content, Cronbach's Alpha is 0.879. All dimensions are greater than 0.7, indicating good internal consistency and reliability. The validity test result of KMO is 0.8, greater than 0.6, Sig. is less than 0.5, and this survey is suitable for continuing analysis.

**Table 11.** Significant Difference Analysis Results of Level of education in Sample of Clothing accessories purchase intention

Variables	Occupation	N	Mean	Std. Deviation	Std. Error	F	Sig.
The number of transportation and merchant services reviews	high school	8	3	1.46385	0.51755	3.925	0.023
	undergraduate	64	3.1016	0.91365	0.11421		
	Postgraduate or Ph.D.	20	2.4	0.96791	0.21643		

**Table 12.** Significant Difference Analysis Results of Length of Exposure to Online Shopping in Sample of Clothing Accessories Purchase Intention

Variables	Length of exposure to online shopping	N	Mean	Std. Deviation	Std. Error	F	Sig.
The number of product reviews	1-2 years	11	1.7727	0.56408	0.17008	3.851	0.025
	2-3 years	15	2.1167	0.44186	0.11409		
	over 3 years	66	2.4129	0.83031	0.1022		
The number of positive reviews	1-2 years	11	1.8182	0.64315	0.19392	3.671	0.029
	2-3 years	15	1.6667	0.39716	0.10255		
	over 3 years	66	2.3371	1.09938	0.13532		

According to Table 11 and Table 12, as a result of the variance analysis, since the Sig. is smaller than 0.05, the level of education is associated with less than five negative reviews of products and transportation, and the length of exposure to online shopping is associated with negative reviews of products and transportation, as well as positive reviews coverage. While age, occupation, average monthly consumption, and online shopping time had no significant difference.

**Table 13.** Correlation Coefficient Matrix for Mainly Variables

Variables	Product reviews	Transportation and merchant services reviews	Positive reviews
The number of product reviews	1		
The number of transportation and the number of merchant services reviews	0.541**	1	
The number of positive reviews	0.591**	0.408**	1

According to Table 13, as the correlation test results, negative reviews on products, transportation, and merchant services, and positive reviews coverage numbers are all positively correlated to the sample of purchase intention on clothing accessories.

### 3.4 Food

According to Table 14, as a result of this survey, 77 respondents chose food, of whom 26 were men, accounting for 33.8%, and 51 were women, accounting for 66.2%. Regarding age distribution, 52 people aged 21-30 make up 67.5%, followed by 31-40, at 14%. The majority of respondents (72.7%) have a college degree, and companies, public institutions, or students employ the majority. It is estimated that 37.7% of the population spends more than 3,500 yuan per month on average, followed by 1,501-2,500 at 24.7%. Overall, 79.2% of respondents have been involved in shopping online for more than three years. 39% of respondents spend 15-30 minutes a day browsing shopping platforms, whereas 23.4% spend no more than 15 minutes.

**Table 14.** Reliability Statistic Results of Food

Dimensionality	Cronbach's Alpha	N of Items
Negative reviews>6	0.948	5
Negative reviews<6	0.658	3
The number of positive reviews to cover 1negative review	0.872	4
Total	0.866	12

**Table 15.** Validity Examination Results of Food

<b>KMO and Bartlett's Test</b>		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.787
Bartlett's Test of Sphericity	Approx. Chi-Square	677.045
	df	66
	Sig.	.000

According to Table 14 and Table 15, the total sample of Cronbach's Alpha is greater than 0.7, indicating good internal consistency and reliability. KMO is 0.787, greater than 0.6, and Sig. is less than 0.5. This survey is suitable for exploratory analysis. But the reliability statistic results of the number of negative reviews smaller than six is 0.658, not greater than 0.7, so the questionnaire of them is not consistent. This paper will analyze the residual parts.

**Table 16.** Significant Difference Analysis Results of Occupation in Sample of Food purchase intention

Variables	Occupation	N	Mean	Std. Deviation	Std. Error	F	Sig.
Negative reviews>6	student	7	2.0286	0.66762	0.25234	2.523	0.037
	Enterprises	29	1.4552	0.95752	0.17781		
	Public Institutions	21	1.3524	0.81463	0.17777		
	Freelancer	12	1.25	0.56649	0.16353		
	Retirement	2	1	0	0		
	Others	6	2.4333	1.01522	0.41446		
	Total	77	1.5117	0.88287	0.10061		

**Table 17.** Significant Difference Analysis Results of Daily time browsing the shopping platform in Sample of Food purchase intention

Variables	Daily time browsing the shopping platform	N	Mean	Std. Deviation	Std. Error	F	Sig.
The number of positive reviews to cover 1negative review	less than 15 minutes	18	2.2222	0.84839	0.19997	2.857	0.043
	15-30 minutes	30	2.05	0.79438	0.14503		
	31 minutes – 1 hour	17	2.3676	1.07208	0.26002		
	more than 1 hour	12	1.5	0.26112	0.07538		
	Total	77	2.0747	0.85462	0.09739		

According to Table 16 and Table 17, It can be seen from the following table that occupation and time spent browsing the shopping platform every day have a significant impact on the difference analysis., especially for more than three negative reviews. Age, gender, education, average monthly consumption, and online shopping exposure time had no significant difference.

**Table 18.** Correlation Coefficient Matrix for Mainly Variables

Variables	Negative reviews	The number of positive reviews to cover 1 negative review
Negative reviews>6	1	
The number of positive reviews to cover 1 negative review	.266*	1

According to Table 18, to the correlation test results, negative reviews are most positively correlated to the number of positive reviews to cover 1 negative review, especially for more than 6 negative reviews.

### 3.5 Digital Home Appliances

In this survey, 61 people chose food, of whom 32 were men, accounting for 52.5%, and 29 women, accounting for 47.5%. Regarding age distribution, 49 people aged 21-30 make up 80.3%, followed by 31-40, at 14.8%. Additionally, 77% of respondents have a college degree, and companies, institutions, or students employ 81.9%. It is estimated that 45.9% of the population spends an average of 1,501-2,500 per month. Less than 1,500 and more than 3,501 are both 23%. In general, 65.6% of people have been involved in online shopping for more than three years, and they have a basic understanding of its operation. As for the daily time of browsing shopping platforms, 70.5% of people spend less than 30 minutes.

**Table 19.** Reliability Statistic Results of Digital Home Appliances

Dimensionality	Cronbach's Alpha	N of Items
Negative reviews	0.976	10
The number of positive reviews to cover 1 negative review	0.740	4
Total	0.945	14

**Table 20.** Validity Examination Results of Digital Home Appliances

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.860
Bartlett's Test of Sphericity	Approx. Chi-Square	1169.878
	df	91
	Sig.	0.000

According to Table 19 and Table 20, the reliability test result of Cronbach's Alpha is greater than 0.7, indicating good internal consistency. Combined with the content of the questionnaire and the result of validity, the dimensions of the food sample are revised to negative reviews and positive reviews number to cover 1 negative review. They could not be analyzed the content of negative reviews. This paper will continue testing the relationship between negative and positive reviews and demography variables.

**Table 21.** Difference Significant Difference Analysis Results of Gender in Sample of Digital Home Appliances purchase intention

Variables	Gender	N	Mean	Std. Deviation	Std. Error Mean	F	P
negative reviews	male	32	1.85	0.95613	0.16902	11.496	0.001
	female	29	1.4	0.68868	0.12789		
The number of positive reviews to cover 1 negative review	male	32	2.0938	0.83702	0.14797	1.544	0.219
	female	29	1.8793	0.70274	0.1305		

**Table 22.** Significant Difference Analysis Results of monthly consumption in Sample of Digital Home Appliances purchase intention

Variables	Monthly Consumption	N	Mean	Std. Deviation	Std. Error	F	Sig.
The number of negative reviews	less than 1,500 yuan	14	1.55	0.8609	0.23009	5.055	0.004
	1,501-2,500 yuan	28	1.3429	0.69305	0.13097		
	2,501-3,500 yuan	5	1.56	0.4827	0.21587		
	more than 3,501 yuan	14	2.3357	0.9516	0.25433		

**Table 23.** Significant Difference Analysis Results of Length of Exposure to Online Shopping in Sample of Home Appliances and Digital Products purchase intention

Variables	Length of Exposure to Online Shopping	N	Mean	Std. Deviation	Std. Error	F	Sig.
The number of negative reviews	1-2 years	6	1.0167	0.04082	0.01667	4.234	0.019
	2-3 years	15	1.3133	0.7269	0.18768		
	Over 3 years	40	1.85	0.90014	0.14233		

According to Table 21-Table 23, It can be seen from the table that gender, average monthly consumption, and length of exposure to online shopping have a significant impact on the difference analysis, especially for negative reviews. Age, education, occupation, and time spent browsing the shopping platform daily have no significant difference.

**Table 24.** Correlation Coefficient Matrix for Mainly Variables

Variables	The number of negative reviews	The number of positive reviews to cover 1 negative review
The number of negative reviews	1	
The number of positive reviews to cover 1 negative review	0.386**	1

According to Table 24, the number of positive reviews to cover 1 negative review 0.386\*\* 1

The correlation test results show that the number of negative reviews is positively correlated to the number of positive reviews to cover 1 negative review, with moderate correlation at the significance level of 0.01.

#### 4. Discussion

Based on the Analysis result, this paper investigates the correlation between content and the number of negative reviews. It reviews the influence of review quantity and credibility on consumers' online purchase willingness based on objective products and subjective contents of reviews. The study mainly concentrated on 21-40 years old people and found that most of them have been shopping online for more than 2 years. They usually spend almost half an hour browsing shopping platforms. Unlike what was expected, less than 20% of consumers purchased goods online for platform promotion, even during the great annual promotion of Double Eleven. However, they prefer to save time and a variety of goods online and are more attracted by brands and their experience. Out of our thinking, people are less influenced by social media influencers, just accounted for 9.5%. One of the reasons may be that it is inconvenient to visit the store during the Covid-19 epidemic, and customers have become more rational and savvier, listening to their internal demands when they choose to shop online after the difficulty of the whole world.

First, for food, the number of negative reviews is positively related to the number of positive reviews to cover one negative review, especially for more than six negative reviews, which will reduce the consumers' willingness. Even though the result cannot differentiate the influence of the content of negative reviews, it seems that when the number of negative reviews is more than six, people with different work will have different responses. The daily time spent browsing the shopping platform also significantly impacts the number of positive reviews to cover one negative review.

Second, for daily necessities, the negative reviews on merchant services correlate more significantly with the number of positive reviews covering one negative review than transportation and product. The result confirms that when negative reviews increase, people need more positive reviews to increase their purchase willingness. Customers' occupations have an impact on their purchase willingness when they determine negative reviews on transportation. However, different monthly consumption of people will influence their willingness after seeing the negative reviews on merchant services, and the length of exposure to online shopping will affect their purchase willingness when reading the negative reviews on products.

Third, for clothing accessories, the number of product reviews has much more impact than transportation and merchant services reviews on the customer. This means that the number of these reviews will affect their judgment about the number of positive reviews to cover one negative and decrease their purchase willingness. Customers with different levels of education will have different willingness when they judge negative reviews, especially for transportation and merchant services reviews. Moreover, the consumer will have a significantly different attitude about the number of negative reviews on the product and positive reviews covering one negative when they have different lengths of exposure to shopping online.

Forth, On the one hand, the number of consumers who choose to buy digital home appliances is not enough to analyze the content of negative reviews. Still, it seems that consumer needs more positive reviews when the number of negative reviews increases and consumers' willingness to purchase digital home appliances will decrease. Simultaneously, the significant difference analysis shows that customers' occupation, average monthly consumption, and length of exposure to shopping online influence customers' judging of the negative reviews. However, there is no evidence to show that the number of positive reviews to cover one negative review is correlated to that of a person. On the other hand, because the number of people who choose to purchase cultural, educational, and sporting supplies is not enough to analyze, there is no evidence to show how negative reviews affect customers' purchase willingness. It may seem that people prefer to buy cultural, educational, and sporting supplies at local stores to have a showrooming when they really need them.

## 5. Conclusion

The limitations of the present paper should be mentioned. Firstly, due to the relatively small number of cultural, educational, and sporting supplies collected in the sample, KMO values were unavailable to allow for exploratory factor analysis. In future studies, the sample size could be increased to improve the relevance of the data. Secondly, there was no way to precisely differentiate which aspects of bad reviews were relevant for different types of goods. In future studies, more detailed longitudinal data on the controls for various product reviews are needed to control for unobserved heterogeneity. Thirdly, while national comparisons between foreign and domestic countries enable the analysis of cross-country differences in the impact of online shopping intentions, this is not possible in the current study because of the limited amount of longitudinal data on this topic to date. Only online reviews are available to study the impact of different dimensions on consumers' purchasing decisions, no research on poor consumer online reviews has been done for different goods. Future research could investigate the influence of the quantitative relationship between domestic and foreign online reviews on consumers' willingness to shop online. However, this study is the first step in analyzing the impact of the number of reviews related to various product review areas in online shopping on consumers' willingness to shop online. With the development of

the Internet, the role of consumer perceptions of online platforms on decision-making has been studied in conjunction with the Internet, bridging the gap of prior research.

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