

The Mechanism of Douyin E-commerce in Influencing Users' Purchase Decisions

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Abstract. With the boom of Douyin e-commerce, product reviews affect users' purchase decisions, yet fake reviews exist. Existing studies lack focus on the link between reviews and sales volume in this context, creating a research gap. This study explores how Douyin e-commerce reviews influence users' purchase decisions to fill the gap. It manually collects first-hand data, including sales volume, positive review rates, repeat customer numbers, and negative review numbers of Shiyan Shi corn chips across different stores and other products in the Shiyan Shi Flagship Store. Regression analysis with ordinary least squares and the control variable method is applied for data analysis. The results show that the sales volume of the same type of food is significantly positively correlated with feedback quantity and with the number of repeat customers. In contrast, it has no significant relationship with the count of negative comments as well as the rate of positive feedback. No significant correlation exists between sales volume of same-store products and all review indicators. The study concludes that merchants should boost real feedback and loyalty instead of fake reviews, and consumers can refer to feedback quantity and repurchases for decisions. Unconsidered factors like price and promotions are limitations.

Keywords: Douyin e-commerce; product reviews; purchase decisions; sales volume; regression analysis.

1. Introduction

In recent times, as short - video platforms have seen swift growth, the landscape of interest - based e-commerce has spurred the integration of social media platforms and online retail domains, and a marketing model led by live streaming has come into being, fueling a rising trend in product sales [1, 2]. Douyin's e-commerce sector has thus become a new battlefield for merchants to compete for traffic. Merchants are constantly experimenting with new promotion methods, whether it is inserting advertisements in internet celebrities' videos to introduce products, live-streaming sales, or marketing approaches like unlocking short dramas by clicking on ads.

Previous studies have shown that product reviews can raise brand expectations, thereby reducing consumers' impulsive online consumption [3]. Even after seeing celebrities' introductions and recommendations of products on the internet, most consumers still choose to read product reviews before placing an order to help them decide whether the product is worth buying. Both sales volume and positive review rate are major factors affecting consumers' decisions, with the positive review rate having a greater impact, and consumer reviews are assuming a growingly vital part in how consumers make their purchase decisions [4, 5]. To improve the positive review rate, many merchants have introduced incentive measures such as cashback for reviews with pictures, and some even use various means to post fake positive reviews to boost their positive review rates, hoping to increase sales in this way [6]. Lv et al. established a model framework for individual purchasing behaviors to model the influence of commodity information spread on purchase behavior when in the social e-commerce context. Their study concluded that short-term utility, long-term reputation, and relationship update frequency are all key factors affecting users' purchasing decisions [7]. Bryant and Basu used negative binomial regression on Etsy data within a Stimulus-Response framework to study

how social commerce site features affect purchases, finding seller-generated cues and engagement boost buying and reduce age-related drawbacks for new entrants [8].

This situation raises two key questions. The first concerns whether merchants' strategy of faking positive reviews can truly boost sales. The second involves how consumers can make judgments and avoid stepping into pitfalls when confronting true and false positive reviews. Existing literature mostly focuses on the impact of Douyin's new promotion methods on sales volume or the way to encourage consumers' impulse buying intention through creativity [1, 2].

To address the aforementioned issues, this paper studies the relationship between product reviews and sales volume on the Douyin platform, aiming to fill the research gap. The research collects data like positive review rates, repurchase rates, follow-up review rates, and sales volumes of different products, directly gathering first-hand data from the platform. Then, the R programming language is used to generate line charts among variables, analyzing variation relationships and trends. Data graphs are drawn for comparative analysis. The study aims to offer suggestions and a basis for merchants to optimize operation strategies and a transparent reference for consumers' shopping decisions.

2. Methods

2.1. Data Sources

The data is primarily obtained through manual collection of first-hand data directly accessible on the Douyin app, including product sales volumes, positive review rates, repeat customer rates, etc. As shown in Table 1, this study selects Shiyang Shi corn chips as the primary research subject, and picks sales volume, buyer reviews, the count of repeat customers, the count of negative reviews, and the positive review rate as metrics. These indicators can fully reflect the degree of customer satisfaction, thereby establishing the relationship between customer evaluations and sales volume. Sales volume directly reflects the market acceptance of products. Buyer reviews, including both positive and negative feedback, are the most intuitive expressions of customers' shopping experiences. The number of repeat customers indicates the loyalty of customers to the product, which is strong proof of product quality and customer satisfaction. The number of negative reviews can help identify product defects or service problems. The positive review rate, as a comprehensive indicator, integrates the above information to a certain extent and reflects the overall satisfaction of customers. The relevant merchant list specifically includes: Shiyang Shi Flagship Store, Tony's Food, Meizhizi Food Franchise Store, Guoyi Franchise Store, and Lays Snacks Flagship Store.

Table 1. Sales and reviews of the same product in different stores

	Sales volume	Feedback	Repeat customers	Negative review	Positive review rate
Shiyangshi Flagship Store	35w+	3.6w+	1w+	903	97.49%
Tonys	9.2w+	662	166	12	98.18%
Meizizi	2.6w+	826	232	10	98.78%
Guoyi	1w+	975	246	32	96.71%
Lays	2944	238	62	3	98.70%

Table 2. Sales and reviews of other products in the Shiyangshi

	Sales volume	Feedback	Repeat customers	Negative review	Positive review rate
Crispy Spicy Strips	17w+	1.2w+	4154	509	95.75%
Popcorn	11w+	1.3w+	5569	107	99.17%
Freeze-dried Chocolate	2.8w+	2636	1113	129	95.10%
Bread Cubes	2.4w+	2765	1189	33	98.80%

To eliminate the impact of brand effects on sales volume, this study also collects the above-mentioned indicators for different products in the Shiyan Shi Flagship Store, as shown in Table 2. The sample list specifically includes: Crispy Spicy Strips, Popcorn, Freeze-dried Chocolate, and Bread Cubes.

2.2. Introduction to Methods

This study adopts methods of regression analysis and control variables. For multiple indicators, this study establishes relationships and analyses each pair of different variables and sales volume, and calculates the correlation coefficients. By doing so, this study judges whether there is a relationship between two variables and what kind of variation relationship exists. Presenting the relationship between customer evaluations and sales volume in the form of charts can more clearly show how customer evaluations affect sales volume, helping the research to better understand the internal mechanism of the relationship between customer feedback and product sales on the Douyin e-commerce platform. Through regression analysis, this study can quantitatively analyze the impact of each indicator on sales volume, and the control variable method ensures that this study can accurately study the relationship between specific variables while excluding interference from other factors.

This study employs the ordinary least squares for regression analysis, with the specific principles as follows, the least squares method uses the sum of squared errors as a criterion to select the line that is ‘closest overall to the data points’ from all candidate lines, providing the most accurate and concise description of the data.

The method of least squares, rooted in the simple principle of "minimizing the sum of squares," offers four key advantages: computational simplicity, theoretical robustness, wide applicability, and transparent results, and is proper for the data analysis of this study.

3. Results and Discussion

3.1. Results

By using linear regression (dependent variable: sales volume, independent variables: other variables) to analyze Tables 1 and 2, the results are shown in Tables 3 and 4, respectively.

The Gradient (β) is the impact of changes in independent variables on sales volume, R^2 is model interpretability (0~1, higher is better), and the P value is significance (<0.05 indicates significance) in Tables 3 and 4.

Table 3. Overall store data regression

independent variable	Gradian(β)	R^2	p	Explanation
Feedback	8.98	0.943	0.006	Feedback \uparrow 1→Sales volume \uparrow 8.98(significant positive correlation)
Repeat	34.21	0.931	0.008	Repeat \uparrow 1→Sales volume \uparrow 34.21(significant positive correlation)
Negative	138.47	0.212	0.432	No significant impact($p>0.05$)
Positive rate	-1.020.000	0.001	0.962	No significant impact($p>0.05$)

Table 4. Shiyanshi product data regression

Independent variable	Gradian(β)	R^2	p	Explanation
Feedback	10.25	0.296	0.452	No significant impact($p>0.05$)
Repeat	30.67	0.390	0.350	No significant impact($p>0.05$)
Negative	-288.70	0.240	0.490	No significant impact($p>0.05$)
Positive rate	540.000	0.001	0.970	No significant impact($p>0.05$)

Combining Table 3 and Table 4, we can see that the sales volume of the same food is significantly positively correlated with the number of reviews and repeat customers, which is clearly reflected in Table 3, in which the number of reviews and the P-value of stores with more sales are less than 0.05. At the same time, in the negative reviews and praise rate part of Table 3, its P value is greater than 0.05, so the sales volume of the same food is not significantly correlated with the quantity of negative reviews and the positive evaluation rate.

Similarly, according to the contents of Table 4, the P value for the count of reviews, negative reviews, and praise rate exceeds 0.05. This indicates that for products within the same store, there is no significant association between product sales and the count of reviews, negative reviews, and praise rates.

3.2. Discussion

This study demonstrates that when people shop online, they not only pay attention to the products themselves. This conclusion is supported by the data presented in Tables 3 and 4 in the previous text. Furthermore, the value of the evaluation quantity for consumers is higher than the rating rate. Consumers rely more on the evaluation quantity rather than the score's high or low to choose products [9]. Because the quantity represents the market's acceptance of the product, and its credibility is also higher than the score. This can also be shown in the data presented in Table 3 above, where the number of repeat customers of stores with more comments is significantly higher than that of ordinary stores. Similarly, the length and quantity of responses have a significant positive impact on product sales; when there are more attribute-type questions, the impact of response length on sales is strengthened; when there are more experience-type questions, the impact of response quantity on sales is strengthened [10]. This proves that the responses under the store help guide consumers' consumption. When consumers purchase a product for the first time, they will refer to the reviews of consumers who have purchased the product. However, it is undeniable that in recent years, due to some merchants fabricating false comments about the products, more and more consumers will reduce the weight of comments when choosing products. To reduce the influence of the marketing strategies and packaging of the merchants on sales, the research subjects can be changed to a single product sold by the same merchants. This will minimize the uncontrollable factors and achieve the goal of controlling variables.

In fact, in the current online environment, the promotional methods for increasing sales are no longer limited to physical advertisements and hiring fake reviewers to write evaluations. More merchants will choose to conduct online promotions through forms such as live streaming, inviting celebrities to endorse, and having the hosts of various platforms advertise. The influence of comments on product sales has significantly declined compared to before. In future research, other sales methods can be selected as independent variables to investigate their impact on product sales.

4. Conclusion

This study explores how Douyin e-commerce reviews influence users' purchase decisions. Regression analysis of data from different stores and products in Shiyuan Shi Flagship Store shows that for the same food across stores, sales volume is significantly and positively associated with the amount of feedback and repeat customers, while negative reviews and positive review rates have no significant impact. However, for products within the same store, no significant relationships between sales volume and these review indicators are found.

These findings suggest that merchants should focus on boosting real user feedback and fostering customer loyalty rather than relying on fake positive reviews. For consumers, references to feedback quantity and repurchase situations may be more valuable for decision-making. Limitations include unconsidered factors like price and promotions, which could be explored in future research.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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