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How Does Algorithmic Recommendation Affect Consumers' Impulsive Purchasing Behavior: Taking Douyin's "Guess You Like" as an Example

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Abstract: This article focuses on the impact of algorithmic recommendation on consumers' impulsive purchasing behavior, taking the typical algorithmic recommendation function of Douyin, "Guess What You Like", as the research object. By deeply analyzing the working principle of algorithmic recommendation and the psychological mechanism of consumers' impulsive purchasing behavior, and combining the actual case of Douyin's "Guess What You Like", this paper explores how algorithmic recommendation influences consumers' impulsive purchasing decisions from aspects such as personalized matching, creating immersive experiences, and generating a sense of urgency. At the same time, analyze the possible negative impacts and put forward corresponding suggestions, aiming to provide theoretical basis and practical reference for e-commerce platforms to optimize algorithm recommendation strategies and guide consumers to consume rationally.

Keywords: Algorithmic Recommendation; Impulsive Purchasing Behavior; Douyin "Guess You Like"

1. Introduction

With the rapid development of Internet technology, e-commerce platforms have emerged one after another, and consumers' shopping methods have also undergone tremendous changes. Algorithmic recommendation, as an advanced information push technology, is widely applied in various e-commerce platforms, such as Douyin's "Guess What You Like", Taobao's "Guess What You Like", and Pinduoduo's "Recommended Products", etc. Algorithmic recommendation can precisely push personalized product information to users based on their interests, behaviors and other data, greatly improving the efficiency of users discovering the products they like. However, this kind of precise push has also led to an increase in consumers' impulsive purchasing behavior. Impulsive purchasing behavior refers to the act where consumers, without prior planning, suddenly develop a desire to buy and immediately make a purchase. This kind of behavior not only affects consumers' financial situations, but also poses new challenges to the marketing strategies and product management of e-commerce platforms.

Douyin, as a highly influential short-video social platform, has a huge user base and rich product resources. Its "Guess What You Like" feature, through a powerful algorithmic recommendation system, combines product information with short video content, creating an extremely attractive shopping environment for users. It is of great theoretical and practical significance to study the influence of algorithmic recommendation in Douyin's "Guess You Like" on consumers' impulsive purchasing behavior.

2. Literature Review

2.1 Research on Algorithmic Recommendation

Algorithmic recommendation is a technology that provides personalized content or product recommendations to users based on their historical behavior data, interest preferences and other information, using specific algorithmic models [1]. Common algorithmic recommendations include collaborative filtering algorithms, content-based recommendation algorithms, and hybrid recommendation algorithms, etc. The collaborative filtering algorithm makes recommendations by analyzing the similarities between users and between products [2]; Content-based recommendation algorithms match and recommend products based on their features and users' interest preferences [3]; The hybrid recommendation

algorithm combines the advantages of the former two and can improve the accuracy and diversity of recommendations [4].

Many scholars have conducted research on the effect of algorithmic recommendation. For instance, the research by Qi Zhao et al. [5] indicates that after applying algorithmic recommendation in e-commerce platforms, the purchase conversion rate of users has significantly increased. Through the analysis of experimental data from a large e-commerce platform, they found that after adopting algorithmic recommendations, the click-through rate and purchase rate of users' products increased by 20% and 15% respectively. This indicates that algorithmic recommendation can effectively guide users to discover the products they are interested in, thereby promoting the occurrence of purchasing behavior.

2.2 Research on Consumers' Impulsive Purchasing Behavior

Impulsive purchasing behavior of consumers has always been a research hotspot in the field of marketing. Scholars have conducted in-depth discussions on the formation mechanism and influencing factors of impulsive purchasing behavior from different perspectives. It is generally believed that impulsive purchasing behavior is jointly influenced by personal factors, environmental factors and commodity factors [6].

In terms of personal factors, personality, emotions, and purchasing experiences can all influence consumers' impulsive purchasing tendencies. For instance, consumers with impulsive personality traits are more likely to exhibit impulsive purchasing behaviors [7]. Emotions are also one of the important factors influencing impulsive purchasing behavior. When consumers are in positive emotional states such as pleasure and excitement, they are more likely to have impulsive purchasing desires [8].

In terms of environmental factors, the store atmosphere, promotional activities, and the influence of others can all have an impact on consumers' purchasing decisions. For instance, a bright and comfortable store atmosphere can enhance consumers' shopping pleasure, thereby increasing the possibility of impulsive purchases [9]. Promotional activities such as time-limited discounts and full-reduction offers can create a sense of urgency and prompt consumers to make purchase decisions immediately [10].

In terms of commodity factors, the attractiveness and price of the goods can also influence consumers' impulsive purchasing behavior. Products with unique designs and fashionable appearances are more likely to attract consumers' attention and trigger impulse purchases. Price is also one of the important factors influencing impulsive purchases. A lower price can lower the purchase threshold for consumers and increase the probability of impulsive purchases.

3. The Working Principle of Douyin's "Guess You Like" Algorithm Recommendation

3.1 Data Collection

Douyin's "Guess What You Like" algorithmic recommendation system first collects a large amount of user data, including basic user information (such as age, gender, region, etc.), browsing history, likes, comments, sharing behavior, search records, purchase records, etc. These data form the basis for the algorithm to make personalized recommendations.

3.2 Feature Extraction and Modeling

By processing and analyzing the collected data, the interest features of users and the features of products are extracted. By applying data mining and machine learning techniques, the interest features of users are extracted from their historical behavior data. For instance, by analyzing users' browsing history and interactive behaviors, the degree of their interest in different product categories can be determined, such as beauty products, clothing, food, etc. At the same time, it is also possible to analyze users' preferences for product attributes, such as color, style, price range, etc. Structure the product information and extract the key features of the products. For instance, for clothing products, extract features such as brand, style, color, size, and material; for electronic products, extract features such as brand, model, function and parameter. By extracting the features of products, they can be described more accurately, providing a basis for algorithmic recommendation. Quantitatively represent the extracted user interest features and commodity features, and establish the user interest model and commodity feature model. The user interest model reflects the degree of users' preference for different product categories and attributes, while the product feature model describes various attributes and features of products. By

establishing these two models, the algorithm can calculate the matching degree between users and goods.

3.3 Recommendation Algorithm Matching

Based on the user interest model and the product feature model, the matching degree between users and products is calculated by using collaborative filtering algorithms, content-based recommendation algorithms or hybrid recommendation algorithms. The collaborative filtering algorithm makes recommendations by analyzing the similarities between users and between products. User similarity can be calculated based on users' historical behavior data. For example, if two users frequently browse and purchase the same type of products, then these two users have a high degree of similarity. Product similarity can be calculated based on the characteristics of the products. For instance, products with similar brands, styles and functions tend to have a high degree of similarity. Once other users who are similar to the target user are found, recommend the products that these users like but the target user has not come into contact with to the target user. Content-based recommendation algorithms match and recommend based on the features of the product and the user's interest preferences. The algorithm compares the features of the product with the preference features in the user's interest model and calculates the similarity between them. The higher the similarity, the more the product conforms to the user's interests and the more likely it is to be recommended to the user. Hybrid recommendation algorithms combine the advantages of collaborative filtering algorithms and content-based recommendation algorithms, which can enhance the accuracy and diversity of recommendations. For instance, content-based recommendation algorithms can be used for initial screening to identify a set of products that highly match users' interests, and then collaborative filtering algorithms can be employed for further recommendations within this set. Consider the similarities between users and between goods.

3.4 Real-time Update and Optimization

The algorithmic recommendation system will monitor users' behavioral feedback in real time, such as their clicks, purchases, and ignores of recommended products. Based on this feedback information, it continuously adjusts the user interest model and recommendation algorithm, optimizes the recommendation results, and enhances the accuracy and personalization of the recommendations. User behavior feedback analysis conducts in-depth analysis of user behavior feedback data to understand the changes in user satisfaction and interest in recommended products. For instance, if a user frequently clicks on a certain type of product but rarely purchases it, it may indicate that the recommendation for this type of product is not precise enough, or factors such as price have influenced the user's purchasing decision. Through the analysis of this feedback information, the algorithm can promptly adjust the recommendation strategy. Model update and optimization: Based on the analysis results of user behavior feedback, the user interest model and recommendation algorithm are updated. For instance, if it is found that a user's interest in a certain brand of beauty products has increased, the algorithm will accordingly adjust the user interest model, enhance the recommendation weight of that brand's beauty products, and continuously optimize the parameters and model structure of the recommendation algorithm to improve the accuracy and efficiency of recommendations.

4. The Psychological Mechanism of Consumers' Impulsive Purchasing Behavior

4.1 Emotional Drive

Emotion is one of the important factors influencing consumers' impulsive purchasing behavior. When consumers are in positive emotional states such as pleasure and excitement, they are more likely to have impulsive purchasing desires. For instance, when consumers come across a product they like, they might experience a pleasant mood due to the beautiful imagination brought by the product, and thus make an impulsive purchase.

4.2 Imbalance of Self-Control

Self-control refers to an individual's ability to suppress impulses and delay gratification. During the shopping process, consumers' self-control ability may be affected by various factors and become unbalanced. For instance, when consumers are confronted with alluring products and promotional activities, their self-control ability may decline, leading to impulsive purchasing behavior.

4.3 Social Comparison and Herd Mentality

Consumers are often influenced by others during the shopping process. When consumers see others purchasing a certain product or giving it a good review, they may develop a social comparison mentality, thinking that they should also own the product, which can trigger impulsive purchases. In addition, the herd mentality can also lead consumers to follow the purchasing behavior of the general public, increasing the possibility of impulsive purchases.

4.4 The Immediacy of Stimulation

Immediate stimulation is more likely to trigger consumers' impulsive purchasing behavior. For instance, activities such as time-limited discounts and limited-time flash sales on e-commerce platforms create a sense of urgency, enabling consumers to make purchase decisions within a short period of time, reducing the time spent on rational thinking, and thereby increasing the probability of impulsive purchases.

5. The Impact of Douyin's "You May Like" Algorithmic Recommendation on Consumers' Impulsive Purchasing Behavior

5.1 Personalized Matching Stimulates Potential Demand

Douyin's "Guess What You Like" algorithm recommendation can precisely push personalized product information to users based on their interest preferences and behavioral data. This kind of personalized matching can tap into users' latent demands and enable them to discover some products that they were previously unaware of but were interested in. For instance, for a user who usually enjoys sports and fitness, the algorithm might recommend related products such as sports equipment and fitness foods to them. When users see these products that match their interests, they are prone to develop a desire to purchase, which in turn triggers impulsive buying behavior.

5.2 Create an Immersive Shopping Experience

Douyin, with short videos as its main content form and combined with the "Guess What You Like" algorithm recommendation, has created an immersive shopping experience for users. When users are browsing short videos, they unconsciously come into contact with various product information. The vivid display and explanation of short videos can attract users' attention and make it easier for them to immerse themselves in the shopping scene. For instance, a beauty blogger showcases the application effect of a cosmetic product in a short video, and the algorithm recommends this video to users who are interested in beauty. While watching videos, users may be attracted by the effects of the products and have the urge to purchase.

5.3 Create a Sense of Urgency to Promote Immediate Purchases

The "Guess What You Like" page on Douyin often displays some promotional activities such as time-limited discounts and limited-time flash sales. The algorithm will precisely push these promotional messages with a sense of urgency to users based on their historical purchasing behaviors and interest preferences. For instance, when a user sees that the product they like is having a limited-time discount and the discount is quite large, they will be worried about missing out on the offer and place an order immediately. This way of creating a sense of urgency can reduce users' rational thinking time and increase the possibility of impulsive purchases.

5.4 Social Interaction Enhances Purchase Intention

Douyin has a strong social attribute. Users can engage in interactive behaviors such as liking, commenting and sharing on the platform. When users see a certain product recommended by a blogger they follow or a friend, they will be influenced by social interaction, developing a herd mentality and a sense of trust. For instance, if a user sees a blogger they like recommending a piece of clothing and many netizens comment in the comment section that they have purchased the clothing and give it high praise, then this user might be influenced and make an impulse purchase of the clothing.

6. The Negative Impact of Algorithmic Recommendations on Consumers' Impulsive Purchasing Behavior and Suggestions

6.1 Negative Impact

Impulsive purchasing behavior often leads consumers to buy some unnecessary goods, thereby increasing financial expenditure and

bringing economic pressure to consumers. When making impulsive purchases, consumers may not fully understand the product information. After purchasing, they may find that the product has quality problems or does not meet their expectations, which may lead to after-sales disputes. Algorithmic recommendation may continuously push similar types of products based on users' historical behaviors, trapping users in an information cocoon, limiting their vision and choice range, and being unfavorable for consumers to discover more high-quality products.

6.2 Suggestions

E-commerce platforms should enhance the accuracy of recommendations while increasing their diversity and randomness to prevent users from getting trapped in an information cocoon. For instance, it is appropriate to recommend some products that are related to the user's interests but of different types to broaden the user's horizons. Establish a strict product review mechanism to ensure the reliable quality of the recommended products. At the same time, improve the after-sales service system, handle consumers' complaints and disputes in a timely manner, and enhance consumers' satisfaction. Set rational consumption reminder messages on the recommendation page, such as "Please purchase reasonably based on your own needs", etc., to remind consumers to avoid impulsive purchases. In addition, detailed information such as the price trend of the goods and user reviews can be provided to help consumers make more rational purchasing decisions.

Consumers should make a shopping list before shopping, clarify their needs and budget, and avoid being tempted by algorithmic recommendations to make impulsive purchases. When you come across a product you like, you can think calmly for a while before deciding whether to purchase it or not. When confronted with a large amount of product information recommended by algorithms, one should learn to distinguish the authenticity and reliability of the information. Don't blindly purchase based solely on the recommended information. You can comprehensively understand the product's situation by checking the product details, user reviews, and other means. Establish a correct consumption concept and recognize that consumption is not merely for satisfying material needs, but also for enhancing the quality of life. Avoid blindly following trends and competing in consumption. Consume reasonably based on your current economic situation and needs.

7. Conclusion

This article takes Douyin's "Guess What You Like" as an example to deeply explore how algorithmic recommendation affects consumers' impulsive purchasing behavior. Research shows that algorithmic recommendations can stimulate consumers' latent demands and increase the possibility of impulsive purchases through personalized matching, creating immersive experiences, fostering a sense of urgency and social interaction. However, algorithmic recommendation has also brought about some negative impacts, such as increasing consumers' financial pressure, triggering quality and after-sales issues of products, and causing the information cocoon effect, etc. To achieve the sustainable development of e-commerce platforms and the rational consumption of consumers, e-commerce platforms should optimize algorithmic recommendation strategies, strengthen the supervision of product quality and guide rational consumption. Consumers should enhance their self-control ability, improve their information discrimination ability and cultivate the concept of rational consumption. Future research can further expand the scope of studies on algorithmic recommendation and consumers' impulsive purchasing behavior, deeply explore the differences in the impact of algorithmic recommendation under different types of consumers and different product categories, and provide more targeted suggestions for the precise marketing of e-commerce platforms and the rational consumption of consumers.

References

[1] Koren, Y., Bell, R., & Volinsky, C. (2009). Matrix factorization techniques for recommender systems. Computer, 42(8), 30-37.

[2] Sarwar, B., Karypis, G., Konstan, J., & Riedl, J. (2001, April). Item-based collaborative filtering recommendation algorithms. In Proceedings of the 10th international conference on World Wide Web (pp. 285-295).

[3] Pazzani, M. J., & Billsus, D. (2007). Content-based recommendation systems. In The adaptive web: methods and strategies of

web personalization (pp. 325-341). Berlin, Heidelberg: Springer Berlin Heidelberg.

[4] Burke, R. (2002). Hybrid recommender systems: Survey and experiments. User modeling and user-adapted interaction, 12(4), 331-370.

[5] Zhao, Q., Zhang, Y., Friedman, D., & Tan, F. (2015, September). E-commerce recommendation with personalized promotion. In Proceedings of the 9th ACM Conference on Recommender Systems (pp. 219-226).

[6] Rook, D. W., & Fisher, R. J. (1995). Normative influences on impulsive buying behavior. Journal of consumer research, 22(3), 305-313.

[7] Verplanken, B., & Herabadi, A. (2001). Individual differences in impulse buying tendency: Feeling and no thinking. European Journal of Personality, 15(1_suppl), S71-S83.

[8] Cohen, J. B., & Andrade, E. B. (2004). Affective intuition and task-contingent affect regulation. Journal of Consumer Research, 31(2), 358-367.

[9] Turley, L. W., & Milliman, R. E. (2000). Atmospheric effects on shopping behavior: a review of the experimental evidence. Journal of business research, 49(2), 193-211.

[10] Van Heerde, H. J., & Neslin, S. A. (2017). Sales promotion models. In Handbook of marketing decision models (pp. 13-77). Cham: Springer International Publishing.