

On the Impact of Taobao's Big Data Push on Teenage Users' Consumption Behavior

Xinyu Chen *

University of Sussex, Brighton, UK

*Corresponding Author: 2727225941@qq.com

ABSTRACT

With the rapid development of Internet technology in recent years, the technology of big data has become more and more widespread in the application of e-commerce. Besides, with the widespread popularity of smartphones, consumers are able to access e-commerce platforms anytime and anywhere, which also generates a large volume of user data and transaction behaviour information. In China, Taobao, as one of the largest e-commerce platforms in the country, has made use of artificial intelligence (AI) and machine learning (ML) technology to allow the platform to accurately profile users, personalised recommendations and other functions. The youth group, as an important part of the market consumer group, has a strong desire to buy. And their behavioural characteristics in online shopping are unique, which also includes their attention to various interactive software pushes when using mobile phones. This paper investigates the impact of Taobao's big data push on the consumption behaviour of teenage users. The study finds that Taobao's big data push significantly impacts teenage consumers' behavior.

KEYWORDS

Big data push; Teenage consumers; Consumer behaviour

1. INTRODUCTION

With the rapid development of the Internet and information technology, e-commerce platforms have become an indispensable part of modern society. Taobao, China's largest e-commerce platform, stands out for its use of big data technology to achieve accurate personalized recommendations, providing users with a convenient shopping experience. However, with the wide application of big data technology in the e-commerce field, particularly regarding its impact on teenage consumers, an increasing number of concerns and discussions have arisen. As an emerging and important consumer group, teenagers not only possess significant consumption potential, but also play an important role in family consumption. Therefore, it is of great practical significance to study the impact of Taobao big data push on teenagers' consumption behaviour.

Firstly, Taobao's mobile software has been constantly updated and advanced to meet consumer preferences. However, according to the scholar Lingling Zhang (2020), although Taobao enjoys a high reputation and has a large portion of the consumer base in the mainland region, its recent development has not met previous expectations in the previous years, and one of the main factors is the quality of its service. One key area for improvement is in the way it is pushed.

Secondly, as digital natives, young consumers are highly receptive to and reliant on mobile payment as well as online shopping technologies. However, the consumption behaviour of young people is not only driven by personal interests and needs, but also deeply influenced by social media and the online

environment. This paper investigates the impact of Taobao's precision push on the consumer behaviour of this group, including the frequency, time, and content of the push.

In addition, in order to further explore the link between the two, we need to understand several factors that influence consumer behaviour. Firstly, the behaviours exhibited by consumers can be observed as the different patterns of behaviours exhibited by consumers before, before and after a decision is made in the process of satisfying their needs through ideas, products or services (Voramontri & Klieb, 2019). Thus, there are various factors that influence consumer behaviour. Specifically, consumer behaviors can be classified into two main categories: internal and external factors .(Zhang, Lingling, 2020). External factors are subdivided into cultural and social dimensions. Each individual's unique values can greatly influence their decisions when they act as consumers. Of course, values can also be shaped by various factors, such as upbringing, regional characteristics, and education . Socio-cultural factors are more able to directly influence consumer preferences and purchase intentions, with language, ethnic identity, and cultural identity directly influencing consumer value identity (Zhang Jing, 2013). This is because that each consumer belongs to a different group in society, their family and the role each of them plays, which also determines the way they consume.

The internal factors affecting consumers include their own characteristics as well as psychological aspects. Age, physical characteristics , and personality all determine how they consume. For example, research shows that most people who enjoy online shopping are affluent office workers or young individuals, such as college students. Interestingly, online shopping is mostly found in rural areas compared to urban areas. Consumers' online shopping behavior can be categorized as either self-oriented or action-oriented. Individuals with more extroverted personalities are more likely to engage in online shopping. They like to share and communicate with their online friends to find the fun of shopping (Zhang Lingling, 2020). Finally, psychological factors tend to play a crucial role. The first is that when consumers make purchasing decisions, they need psychological motivation for online shopping, and the second is that the e-commerce platform can also stimulate the consumers' desire to buy, and when consumers perceive the value of the goods, they are more likely to commit to the purchase. (Zhang Lingling, 2020).

Through the above research, we can conclude that most of the influence of online shopping on adolescent consumption is influenced primarily through psychological factors. The other three aspects are inherently external, uncontrollable, and vary from person to person. So, what is the psychological cognitive process of consumers? According to scholars Chen Ke et al. (2016), consumers develop a full understanding of goods through psychological activities such as sensation, perception, attention, memory, thinking, association, and imagination, which generate emotional responses, further triggering consumption behaviors, and are closely tied to volitional activities. Additionally, according to scholars Lu Jinsheng and Liu Yun (2009), when consumers focus on various forms of consumer behavior, they concentrate their attention on a specific object. Here, 'attention' is mainly embodied in two aspects: concentration and directionality. Directionality is the selective focus on a specific object, while concentration refers to the ability to maintain continuous, deep focus on this selection without being influenced by unrelated factors. Therefore, this will be considered in the design of the research methodology for the next study.

2. LITERATURE REVIEW

According to Hu, Chunhua et al. (2020), the interrelationship between consumers' online shopping behaviors, such as product preference and loyalty, and their personal attributes, such as age, gender, and geography, was analyzed using a questionnaire. The results clearly showed that consumers who use recommender systems spend 14.7% more on online shopping than those who do not. Additionally, the analysis revealed that the effectiveness of e-commerce recommendations is influenced by complementary products on the platform and other factors. Guzzo et al. (2016) stated that users' perceived usefulness helps predict their frequency of using a particular e-commerce system. Lim et

al. (2015) noted that e-commerce recommendation systems improve consumers' online shopping experience, increasing both order rates and payment conversion rates. Scholar Lingling Zhang (2020) enumerated various consumer behaviors, highlighting that external factors, such as marketing and promotional strategies, can significantly influence these behaviors. The research center led by Lu Jiaqi and Zhuge Yang (2023) emphasized the importance of 'social consumption psychology,' where human consumption shifts from satisfying physiological needs to fulfilling socially significant behaviors, increasingly becoming group-oriented.

Many scholars have studied the relationship between online shopping push systems and consumer behavior, with clear evidence that the former influences the latter. However, fewer studies have focused specifically on big data push systems on platforms like Taobao, highlighting the need for further in-depth research.

3. RESEARCH METHODOLOGY AND VARIABLES

3.1. Research Methodology

Given the diversity and complexity of the factors that can influence consumers, it was decided, after comprehensive consideration, to adopt the questionnaire research method to increase research efficiency and analyze consumer-related content. Data was then collected through the questionnaire.

3.1.1. Identification of research variables

Independent variables: push content, push frequency, push time

Dependent variable: adolescents' consumption behaviour (e.g. number of purchases, amount of purchases, type of purchases, etc.)

3.1.2. Identification of research questions

How does push content (e.g., product type, ad style) influence teens' consumption decisions?

What is the effect of push frequency (e.g. number of pushes per day) on adolescent consumption behaviour?

Does the timing of the push (e.g. daytime, nighttime) affect adolescents' shopping tendencies and behaviour?

Does personalised push affect consumers' mental activity?

3.2. Questionnaire

3.2.1. Questionnaire design

A detailed questionnaire was first designed which included the following sections;

Demographic information: e.g., age, gender, household income, etc.

Consumption behaviour: e.g. shopping frequency in the last month, amount of shopping, types of goods often purchased, etc.

Push experience: e.g. acceptance of push content, feelings of push frequency, preference of push time, etc.

In addition to this, considering the fact that the respondents were predominantly a group of teenagers, it was decided to keep the number of questions in the questionnaire to less than 10 and to control the length of the options in particular, in order to prevent them from being susceptible to the influence of the mind and to lose their patience easily.

3.2.2. Survey respondents and number of questionnaires

This study was conducted using electronic questionnaire research.

Survey Objects: 16-25 years old, usually use Taobao often teenage users

Number of questionnaires: 101 questionnaires distributed, 101 valid questionnaires, 100 per cent recovery rate; 101 questionnaires distributed, 101 valid questionnaires, 100 per cent recovery rate

3.2.3. Descriptive statistical analysis of sample characteristics

After the survey, the statistical results of Questionnaire 1 are as follows:

Table 1. Thoughts on push frequency

age groups	percent
15-18 years	21.78 percent
19-22 years	45.54 percent
23-25 years	32.67 percent

Table 2. Whether or not push will be turned on

Choice	percent
Yes	69.19 percent
No	30.81 percent

Table 3. Whether the push content matches the interest

Whether the push content matches the interest	percent
in line with	60.4 percent
usual	36.63 percent
falling short (of expectations)	2.97 percent

Table 4. Thoughts on push frequency

Thoughts	percent
too frequent	23.67 percent
conveniently situated	63.37 percent
too few	12.87 percent

Table 5. Whether or not you will buy items you wouldn't otherwise buy because of push messages

Choice	percent
Yes	27.72 percent
No	72.28 percent

Table 6. Perceptions of which time of day pushes have the most impact on them

Times	percent
Morning (8:00-12:00)	28.71 percent
Afternoon (12:00-18:00)	46.53 percent
Evening (18:00-24:00)	24.75 percent

Table 7. Monthly consumption amount of the user

Consumption	percent
Less than \$100	34.65 percent
\$100-500	44.55 percent
500-1000 yuan	15.84 percent
More than \$1,000	4.95 percent

As evident from the data, the timing and frequency of big data pushes have a clear impact on teenage consumers. Push notifications sent in the afternoon (12:00-18:00) are more effective, encouraging higher spending. Regarding frequency, maintaining a moderate number of pushes per day proves most effective in promoting consumption; excessive or insufficient pushes can diminish their effectiveness.

After studying the impact of the changes in big data push on teenage consumption, a survey on the psychological impact on teenage consumers was also completed, with the following data: (Note: Users of Questionnaire 2 were basically those who had push turned on)

Table 8. Age groups

age groups	percent
15-18 years	22.77 percent
19-22 years	47.52 percent
23-25 years	29.7 percent

Table 9. Recommended Content Preferences (multiple choice)

Content	percent
New Products	60.39 percent
time-limited discount	54.46 percent
Personalised recommendations	39.6 percent

Table 10. Behaviour when push information is not of interest

Behaviour	percent
Click to view now	69.31 percent
Bookmark or add to cart	51.49 percent
Compare to other products	24.75 percent
Direct purchase	5.94 percent
Ask others for their opinion	5.94 percent

Table 11. Factors that prompted the purchase (multiple choice)

Factors	percent
Strong desire to buy	22.77 percent
Fear of missing out on limited time offers	21.78 percent
Influence of friends/network opinions	17.82 percent
Attractiveness of advert copy	16.83 percent
Attractive product images/videos	20.79 percent

Table 12. User behaviour after receiving a push

Behaviour	percent
Ignore this push	50.5 percent
Unsubscribe/Block Push	40.59 percent
Changing Push Preferences	8.91 percent

Table 13. The effect of push messages on users' psychologically perceived monthly consumption behaviour

Degree	percentage
increase significantly	14.85 percent
increase	25.74 percent
No impact	37.62 percent
Decrease	14.85 percent
substantial reduction	6.93 percent

From the data above, it is clear that Taobao's Big Data push content quickly captures the attention of teenage users, with most opting to click immediately when they encounter something of interest. In terms of push preferences, over 50% of the pushes involve limited-time offers and new product releases, indicating teenagers' strong curiosity about new products and sensitivity to discounts. Regarding the factors influencing purchases, the five listed factors were distributed relatively evenly, suggesting that different factors can impact consumer psychology. However, the low proportion of direct purchases shows that most people do not place an order immediately after receiving a push but prefer to deliberate further. Additionally, the majority of users reported that big data pushes did not significantly affect their overall spending, implying that while pushes likely influence behavior, they do not necessarily determine whether users will ultimately make a purchase. Finally, most users choose to ignore or block irrelevant pushes, highlighting the need for platforms to carefully manage such content to avoid frustrating users and better guide consumer behavior.

4. CONCLUSIONS AND OUTLOOK

Throughout history, the impact of big data recommendations on consumers has consistently been a topic of interest. This paper uses Taobao and teenage users as a case study, employing questionnaires to explore the platform's influence on this demographic. The timing and frequency of big data pushes significantly affect teenage consumers, with afternoon pushes proving more effective. An optimal push frequency also encourages consumption. Additionally, big data pushes tend to influence consumers at a psychological level during the purchasing process. For instance, Taobao attracts teenage consumers initially through new product launches and limited-time promotions, and further engages them on product pages via customer reviews, advertising copy, and short product videos. However, it is important to note that while these pushes likely influence consumer behavior, they do not necessarily determine the final purchase decision. Given the rapid development of the AI industry, we can expect future big data pushes to become more intelligent and refined, allowing teenage consumers to enjoy the convenience of this feature while further advancing the growth of Taobao and other e-commerce platforms.

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