A Study of Usage Behavior of Tiktok Users in China[†]

Li Jie[1,*] and Chuleerat Kongruang[2]

[1]*College of Graduate Studies, Walailak University, Nakhon Si Thammarat 80160, Thailand*
[2]*School of Accountancy and Finance, Walailak University, Nakhon Si Thammarat 80160, Thailand*

(Corresponding author's e-mail: 2535248261@qq.com)

Abstract

With the rapid development and application of 5G technology in the world, short video business has become a new development opportunity for many Internet companies. As of December 2020, the number of short video users in China is 873 million, and Tiktok is the best company in the field of short video in China.

This study achieves 2 purposes by studying the behaviors of Tiktok users: One is to study the reasons for the rapid growth of Tiktok users and what are their motivations for using Tiktok. The second is to study when and where Tiktok users use Tiktok, and whether these variables are necessarily related to users' business behaviors.

This study adopts quantitative research methods, including literature research and investigation. A questionnaire was designed and 623 groups of Tiktok effective users were obtained. This study uses descriptive statistics and hypothesis testing statistical methods, statistics, analysis and conclusions.

There are 2 conclusions of this study:

1) The rapid growth of Tiktok users is the inevitable result of multiple factors superimposed with Chinese material abundance, COVID-19 and entertainment as the main motivations. The gamification design and operation of TikTok product itself is also one of the important factors driving the rapid growth of Tiktok users. Tiktok users' motivation for entertainment is dominant.

2) There are more female Tiktok users than male users, and the users are between 22 and 41 years old. The main usage scenarios of Tiktok users are family and commuting. There is no significant correlation between the independent variable of the study and variable traffic, indicating that Tiktok user behavior has great randomness.

Keywords: Tiktok users, Usage scenario, Usage period, Randomness, Motivation

Introduction

Short video, namely short video, is a way of Internet content transmission. Generally, it is a video spread on the Internet new media with a duration of less than 5 min. With the popularization of mobile terminals and the acceleration of the network, short, fast and large-flow content is gradually favored by various platforms, fans and capital.

With 5 g technology on a global scale, the rapid development and application of short video rise rapidly, as a new growth engine, the Internet platform company China has emerged a large number of short video operation platform, many short video platform company is caught such historical opportunity, a positive innovation, rapid walking in the forefront of the world, Excellent app products like Kuaishou and Tiktok were born. In China, Tiktok has become the most successful among many short video apps, forming an upstream and downstream industrial chain centered on Tiktok. As of December 2020, the number of short video users in China was 873 million, accounting for 88.3 percent of the total Internet users.

[†]Presented at the Conference in Management: Summer 2022 (July 9, 2022 at Walailak University, Thailand)

This study focuses on 2 main objectives:

1) Why are Tiktok users growing rapidly and what are the motivations of Tiktok users?

2) When and where do Tiktok users use Tiktok? Whether these variables are necessarily related to the user's business behavior.

This study mainly analyzes Chinese Tiktok users. The policy of internal reform and opening to the outside world began in December 1978 at the third Plenary Session of the eleventh Central Committee. Since then, China's politics and economy have developed rapidly in the past 30 years. China's manufacturing industry is in a leading position in the world, producing a large number of manufactured goods and greatly meeting the material needs of the people. In addition, with the development of urbanization, social wealth continues to accumulate. Since 2018, the Chinese government has launched a massive battle against poverty. With the help of the government, numerous low-income and poor families have been gradually lifted out of poverty.

In the case that material conditions are greatly satisfied, according to the hierarchy of human needs theory of Abraham Maslow, a famous American social psychologist, when food and clothing are solved, people's social needs at a higher level are generated. It is "people's inner need to take control of their lives, to learn and create new things that will make them and the world around them better." Short video is to meet people's inner, spiritual needs.

In addition, with the slowdown of global economic growth, the COVID-19 epidemic in 2020 has even disrupted communication between countries and regions, isolating countless people around the world. During this period, the development of mobile Internet has accelerated, and short video has ushered in a historic opportunity for development. The development of short video may affect and change the way of life, work and study of a generation, with far-reaching influence.

Based on the behavioral design model of Professor (Fogg, 2021) from Stanford University, this study studies Tiktok user behavior from the perspective of motivation, ability and trigger factors, which can provide reference for commercial design, development of new short video platform and analysis of consumer behavior.

Problem statement

Founded in 2012, Beijing Bytedance Technology Co., Ltd. launched toutiao, a recommendation engine based on data mining, in March of the same year. In June 2016, Bytedance set up a short video product matrix in China, including Tiktok, watermelon video and volcano video. Within 9 years, Baidu, which was founded in 2000, has grown into the third largest Internet company in China after Alibaba (Tencent and Alibaba are the first and second, with a market value of HK $4.36 trillion and HK $3.29 trillion respectively).

Bytedance's overseas products, including Top Buzz, Tiktok and Hypstar, now cover 75 languages and are among the Top app stores in more than 40 countries and regions.

Tiktok also has a large and growing number of registered users in the US, India and other countries. Bytedance is preparing to list in Hong Kong at a market valuation of about HK $780 billion.

According to statistics, Tiktok's user base in China increased more than 40-fold from January 2017 to January 2019. According to the 42nd Statistical Report on China's Internet Development and the 2019 Annual report on Content creation released by Baidu, the number of short video users in China has reached 594 million, accounting for 74.19 % of the total Internet users, and the number of daily active users has reached 160 million, showing explosive growth in the short video industry. At the end of 2019, Tiktok exceeded 1.5 billion hours of usage abroad, with India and the United States experiencing the most significant growth.

Tiktok products meet the needs of users, so that a large number of users continue to join, analyze their motivation and purpose of using Tiktok products. In addition, such a large user group has what kind of behavior habits and behavioral characteristics, what is the user characteristics, name, age, when and where to use, whether there is a connection between the use of behavior and business behavior.

The development of 5G and blockchain technology has promoted the transformation of production mode, and the way people live and work is changing. The world is becoming more connected and interconnected, with more rapid dissemination of information, more transparent societies and more frequent exchanges. Tiktok product is only an application that grasps the development opportunities of The Times. Tiktok will never be the only app platform in the future. The research on Tiktok user behavior is of reference significance to the analysis of commercial design and consumer behavior.

Research objectives
1) Why are Tiktok users growing rapidly and what are their motivations for using Tiktok?
2) When and where do Tiktok users use Tiktok? Are these variables necessarily related to the user's business behavior?

Scope of study
The scope of this study is Tiktok users in China (including Chinese and foreign users living and working in China). The sampling process is random sampling survey, regardless of age, gender and region.

Methodology

Theoretical model
According to the behavioral design model of Professor (Fogg, 2021) from Stanford University, 3 elements are needed for the generation of a person's behavior, namely Motivation, Ability and Triggers. That is to say, for a person's behavior to happen, there must be enough motivation, ability, and trigger factors to cause the behavior to happen. As shown in figure:
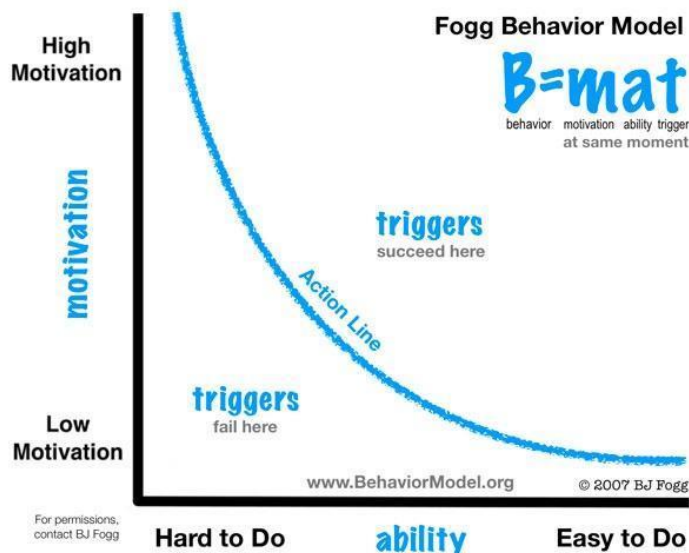

Figure 1 Behavioral model diagrams of BJ Fogg.

Fogg (2021) summarized motivation and believed that there were 3 categories. The first category was direct motivation, such as pleasure or pain. The second type is indirect motivation, such as hope or fear. The 3 categories are social approval and rejection.

The user's ability mainly includes time cost, money cost, physical effort, mental effort, social pressure, habit strength and so on. Fogg (2021) believed that what users cared about most was cost, and instead of increasing his motivation with more temptations, he should find ways to reduce his cost.

Trigger factors, such as Spark, Facilitator, and Signal, are manifested in the use of Tiktok as promotion, discount, seckill, and group purchase behavior after adding fan group. Successful behavioral transformation occurs when the motivation is strong and the implementation cost is low, which is at the top of the model curve.

This paper studies Tiktok users' behaviors, mainly through data analysis of users' motivation, ability and triggered purchase behaviors.

Analysis methods
Literature research
Driving force

Psychodynamics holds that human behavior is generated from inherited instinct and biologically driven needs, and provides the power to resolve the conflict between individual needs and social requirements, obtain the optimal living state, and achieve physiological arousal and psychological satisfaction.

Pinker (2018) author of Drive, explains in detail how to inspire enthusiasm when rewards and punishments have failed. Based on 40 years of research on human motivation, (Pinker, 2018) reveals that external incentives such as carrots and sticks are no longer the best way to motivate people and reexamines the 3 elements of motivation: Autonomy, specialization and purpose.

In this study, Tiktok users' autonomous behaviors are derived from the following internal driving forces: First, entertainment behavior. Users get pleasure from Tiktok platform. According to the behavioral design model of Professor (Fogg, 2021). Tiktok users also have the hope that Tiktok users can accumulate fans or traffic through Tiktok platform to achieve profit growth or personal brand building. Or learning new skills or knowledge through Tiktok are concrete actions that satisfy hopes or overcome fears.

Gaming

In Game Changing the World, (McGonigal, 2020) identified 4 characteristics of games: Ambitious goals, clear rules, timely feedback, and voluntary participation. Tiktok basically meets all the features of the game, according to the study.

"There was a lot of positive feedback in the game", Fan said of Game Change. "We were inspired by how much people like to be recognized. It's like being back in primitive society. In the primitive society, gaining the affirmation of the whole tribe means you can live. If the whole tribe doesn't like you, you can't live. Therefore, gaining the affirmation and feedback of others is the most primitive inner motivation of people." Tiktok uses algorithmic rules such as likes, comments and retweets in its algorithm. Users attract likes and comments through creativity, which actually magnifies the principle of timely feedback in the game. The very act of using Tiktok is gamification.

Hierarchy of needs

Maslow's hierarchy of needs theory is one of the important theories of humanistic science. It was proposed by Abraham Maslow, an American psychologist, in his paper human Motivation Theory in 1943. The book divides human needs into 58 levels from low to high like a ladder, namely, physiological needs, safety needs, social needs, respect needs and self-actualization needs.

After the founding of New China in October 1949, the country experienced the "3 years of difficulties" and the 10-year Cultural Revolution, and faced the most serious economic difficulties and political crisis since the founding of the People's Republic of China. That era was defined as the "material shortage" era, some of the innate needs of human, physical attributes of the demand is more intense. At that time, the dream of most Chinese people was to solve the problem of food and clothing. However, after 1978, after decades of reform and opening up in China, most people have been able to feed themselves and realize their dreams of owning their own house and car. With the rapid development of China's politics and economy, social wealth is accumulating and people's life is unpretendingly rich.

Numerous low-income and poor families are gradually getting rid of poverty with the help of the government. In this case, the pursuit of the spiritual increasingly strong.

In this case, people's artistic creation ability, empathy ability and invention ability are fully brought into play, providing a good environment for creative products like Tiktok. Tiktok products also precisely meet users' social needs, respect needs and self-actualization needs.

Population and sampling methods

Users are the most important gene driving Tiktok's rapid development. According to various media and official announcements, the number of Tiktok users has exceeded 700 million by December 2020.

TikTok has not been on the market for less than 6 years, and many data can only be directly investigated without too much public data. There are not many research results on Tiktok users' use behavior on available academic websites in China. In view of this situation, this study mainly adopts questionnaire survey to collect data.

Questionnaire is widely used in social investigation and research. It has the advantages of short time, good anonymity, large sample size, wide geographical coverage, and easy data processing by computer. With the rise of online questionnaires, questionnaires are easier to execute.

The questionnaire design method of this study is the backward goal method. Firstly, considering that users may have differences in gender, age, region and city, relevant questions are designed in the questionnaire. Secondly, the purpose of this study is to study the behavioral characteristics of Tiktok users in different age groups. Therefore, it is necessary to know Tiktok users' motivation, time period, usage scenarios, salary level, whether they will buy products on Tiktok and the number of times they buy products annually.

Considering that there is a saying in China that "Tiktok in the south and Kuaishen in the north", in order to avoid unreasonable sampling, the same number of questionnaires were collected in each province as far as possible, and the age of users were screened to ensure the authenticity and representativeness of data as much as possible. In the process of data collection, 50 percent of the questionnaires were sent to the north and the south, taking into account regional differences. One is the offline questionnaire, which is carried out by friends in various provinces and people around. After the questionnaire is completed, the questionnaire is directly sent back by taking photos. The second is to issue online questionnaires made by questionnaire star software, which are also put in accordance with the region.

Finally, 680 online questionnaires and 98 on-the-spot questionnaires were collected in this sampling. A total of 778 samples were collected, including 155 non-Tiktok users and 623 valid Tiktok users.

Variable description
The dependent variable

The dependent variables in this study are whether Tiktok users have purchase behaviors and the annual purchase frequency. Tiktok users' purchase behavior is conditional, often affected by economic conditions, use environment, use period, gender and other factors. Tiktok users may have consumption behaviors only when they use Tiktok products. In this study, due to the influence of privacy protection factors of investigated users, the specific consumption amount statistics of users cannot be obtained, but only the approximate consumption frequency can be counted.

The independent variables

The independent variables in this study are age, gender, scene, time period and salary, all of which may be factors affecting Tiktok users' consumption behaviors. In particular, for the convenience of statistics, the questionnaire in this study adopts single choice. Tiktok users may actually use Tiktok products in multiple periods and scenarios, so the impact of scenario and period on consumer behavior can only be an extreme case.

Hypothesis testing

Tiktok users are likely to have consumption behaviors only when they use the product. This study assumes that the dependent variable is necessarily related to the independent variable, and the validity of the hypothesis is verified through hypothesis testing below.

Table 1 Analysis on the difference of annual purchase times of different genders.

	Gender	N	Mean	Std. deviation	t	P
Annual purchase times	male	293	1.69	2.344	0.091	0.927
	female	330	1.68	2.330		

T-test is used to analyze the annual purchase times of different genders, and the results are shown in the **Table 1**. The statistical results showed that t = 0.091, P = 0.927. There is no significant difference between the annual purchase times for different genders.

Table 2 Analysis of the differences in annual purchase times of different ages.

Age	N	Mean	Std. deviation	F	P
≤ 21	62	1.60	2.350		
22~26	118	1.60	2.343		
27~31	124	1.53	2.311	0.870	0.481
32~41	237	1.68	2.299		
≥ 42	82	2.11	2.455		
Total	623	1.68	2.335		

F-test was used to analyze the annual purchase times of different age groups, and the results are shown in the **Table 2**. The statistical results showed that F = 0.870, P = 0.481. There is also no significant difference between the number of annual purchases by different age groups.

Table 3 Analysis of the difference of annual purchase times in different scenarios.

Working with scen	N	Mean	Std. deviation	F	P
Home	123	1.70	2.416		
Commute to and from work	86	1.40	2.149		
Dining room	83	1.82	2.450		
Workplace	79	1.77	2.353		
Party	79	1.41	2.139	0.517	0.822
Market	62	1.87	2.466		
School	44	1.77	2.458		
Fitness room	67	1.85	2.318		
Total	623	1.68	2.335		

F-test is used to analyze the annual purchase times of users in different usage scenarios, and the results are shown in the **Table 3**. Statistical results showed that F = 0.517, P = 0.822. Indicates that there is no significant difference between the annual purchase times of users in different usage scenarios.

Table 4 Analysis of the difference of annual purchase times in different use periods.

Use period	N	Mean	Std. deviation	F	P
1：00~4：00	49	1.84	2.384		
5：00~8：00	90	1.43	2.136		
9：00~12：00	68	2.18	2.497		
13：00~16：00	107	1.85	2.398	1.245	0.286
17：00~20：00	166	1.47	2.239		
21：00~24：00	143	1.68	2.408		
Total	623	1.68	2.335		

F-test is used to analyze the annual purchase times of users in different usage periods, and the results are shown in **Table 4**. Statistical results showed that F = 1.245, P = 0.286. Indicates that there is no significant difference between the annual purchase times of users in different use periods.

Table 5 Analysis of differences in annual purchase times of different salaries.

Range of salary	N	Mean	Std. deviation	F	P
≤ 2,000	68	1.74	2.423		
2,001~3,500	202	1.71	2.319		
3,501~5,000	176	1.79	2.363	0.319	0.865
5,001~6,500	171	1.53	2.314		
≥ 6,501	6	1.33	2.066		
Total	623	1.68	2.335		

F-test is used to analyze the annual purchase times of users with different salary ranges, and the results are shown in **Table 5**. Statistical results showed that F = 0.319, P = 0.865 indicates that there is no significant difference among the annual purchasing times of users with different salary ranges.

Table 6 Working with scene and buy or not crosstabulation and chi-square test.

Working with scene	Buy or not		Total	χ^2	P
	Buy	Not to buy			
Home	55(44.7 %)	68(55.3 %)	123(100.0 %)		
Commute to and from work	37(43.0 %)	49(57.0 %)	86(100.0 %)		
Dining room	41(49.4 %)	42(50.6 %)	83(100.0 %)		
Workplace	36(45.6 %)	43(54.4 %)	79(100.0 %)	2.735	0.908
Party	31(39.2 %)	48(60.8 %)	79(100.0 %)		
Market	28(45.2 %)	34(54.8 %)	62(100.0 %)		
School	20(45.5 %)	24(54.5 %)	44(100.0 %)		
Fitness room	34(50.7 %)	33(49.3 %)	67(100.0 %)		

Note: The percentages in parentheses represent the percentage of rows, i.e. the percentages of the different categories in the row direction add up to 100 %

Use chi-square test to analyze whether there is a correlation between working with scene and buy or not. The results are shown in **Table 6**, indicating that there is no significant correlation between Working with scene and Buy or not.

Table 7 Use period and buy or not crosstabulation and chi-square test.

Use period	Buy or not		Total	χ^2	P
	Buy	Not to buy			
1:00~4:00	23(46.9 %)	26(53.1 %)	49(100.0 %)		
5:00~8:00	38(42.2 %)	52(57.8 %)	90(100.0 %)		
9:00~12:00	40(58.8 %)	28(41.2 %)	68(100.0 %)	9.809	0.081
13:00~16:00	53(49.5 %)	54(50.5 %)	107(100.0 %)		
17:00~20:00	63(38.0 %)	103(62.0 %)	166(100.0 %)		
21:00~24:00	65(45.5 %)	78(54.5 %)	143(100.0 %)		

Note: The percentages in parentheses represent the percentage of rows, i.e. the percentages of the different categories in the row direction add up to 100 %.

The Chi-square test was used to analyze whether there was a correlation between use period and buy or not. The results are shown in **Table 7**, which shows that there is no significant relationship between the using period and buy or not.

Results and discussion

According to data analysis, Tiktok female users are higher than male users, and their ages are concentrated between 22 and 41 years old, accounting for about 76.88 % of the total number of users. The main usage scenarios of Tiktok users are family and commuting, accounting for 33.5 % of the total users, and their motivation is entertainment.

T-test was used to analyze the annual purchase frequency of users of different genders, different ages, different usage scenarios, different usage periods and different salary ranges, and the results showed no significant differences, rejecting the null hypothesis.

The Chi-square test is used to analyze whether there is a correlation between the usage scenario and whether to buy, the usage period and whether to buy. Again, there was no significant correlation among these variables.

Conclusions

The rise of short video is the inevitable result of the abundance of human material culture. Especially in China, after 30 or 40 years of economic development, the society has changed from material scarcity to general wealth. The abundance of material wealth has greatly met the material needs of the people, greatly enhanced the importance of beauty and emotion, and accelerated the pace of people to explore the meaning of life. And while material things make life better, they don't necessarily make people happier.

Tiktok products satisfy people's behavioral motivation of joy, hope and social recognition. Since 2020, under the global epidemic, the world has pressed the pause button. Most Chinese people often stay at home and have a lot of time, brain, physical strength and money to invest in Tiktok products because of their ability to produce.

In the past 3 years, millions of billionaires have been born in the field of short video, and countless users have turned from participants to creators. Various advertisements flood the Internet, and users can use Tiktok app with goals or monetary rewards. Various information has stimulated, induced and attracted more Tiktok users.

The emergence of Tiktok is a product of The Times and an inevitability of the 5G era, conforming to the trend of social development.

The explosive growth of users fundamentally reflects the development of social development from a rational society to a perceptual society, and is the result of the resultant force of driving factors such as autonomy, specialization and purpose and users' needs for social interaction, respect and self-realization. The outbreak and growth of Tiktok's short videos cannot be separated from its gamified product design and product model, and the COVID-19 pandemic has accelerated its development.

According to the normal logic, the longer users use it and the more people use it, the more likely they are to have consumption behavior, and the more money they have, but the hypothesis test rejects such hypothesis. Tiktok users' behavior is random.

There are 2 conclusions from this study:

1) The rapid growth of Tiktok users is the inevitable result of multiple factors superimposed with Chinese material abundance, COVID-19 and entertainment as the main motivations. The gamification design and operation of Tiktok product itself is also one of the important factors driving the rapid growth of Tiktok users. Tiktok users' motivation for entertainment is dominant.

2) There are more female Tiktok users than male users, and the users are between 22 and 41 years old. The main usage scenarios of Tiktok users are family and commuting. There is no significant correlation between the independent variable of the study and variable traffic, indicating that Tiktok user behavior has great randomness.

Acknowledgements

References

Cass, J. (2019). *Limited and infinite games*. Beijing, China: Publishing House of Electronics Industry.

Chunyu, D., & Lu, J. (1997). Research on method-ology of law of entropy increase. *Research on Dialectics of Nature, 4*, 48-52.

Edward, L., & Desi, R. (2020). *Intrinsic motivation: the power to control life independently*. Beijing, China: China Machine Press.

Fogg, B. J. (2021). *Fogg behavior model*. New York, United States: Tiny Habits.

Gao, C. L. (2016). Research on the "use and satisfaction" of short video app on mobile terminal - a case study of kuaishou app. *News Knowledge, 12*, 3-6.

Imedia Consulting. (2020). New internet giants driven by intelligent algorithms. *Bytedance Research Report, 2020*, 3-36.

Kahneman, D. (2020). *Thinking, fast and slow*. New York, United States: Farrar, Straus and Giroux.

Ma, H. Y. (2018). Audience psychology of short video social software: A case study of "Douyin" app. *News Research Guide, 5*, 59-60.

McGonigal, J. (2020). *Games change the world*. Beijing, China: Beijing United Publishing Company.

Ning, P. (2019). Research on the use and satisfaction of mobile short video users - taking Douyin short video as an example. *Huazhong University of Science and Technology, 5*, 1-51.

Pinker, D. (2018). *Driving force*. Zhejiang, China: Zhejiang People's Publishing House.

Wang, S. Y., & Lu, Y. (2018). Research on audience preference of short video app. *Vision and Listening, 2*, 98-99.

Wei, C. (2021). Research on user behavior analysis system model of Douyin Platform based on hadoop. *Science and Technology Innovation, 24*, 86-87.

Wu, B. (2018). Research on the use and satisfaction of short video social media: A case study of college students' use of "Douyin" app. *News Research Guide, 8*, 228-230.

Xu, J. H., & Li, X. N. (2019). Research on Tiktok short video APP user behavior. *Chongqing Administration, 1*, 87-88.

Yan, Z. R. (2018). *Research on the use behavior of "Douyin" quyuan group - based on the use and satisfaction theory*. Wuhan, China: Wuhan University.

Yang, H. (2019). Research on user motivation and user behavior of Douyin short video. *Academic Forum, 7*, 233-235.

Yang, S., Chen, S. J., Gong, S. S., & Zhang, G. W. (2019). Development of Douyin users' emotional attachment questionnaire. *New Media Research, 7*, 56-58.