Advertisement or Services? The Choice of Customers' Subscription

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Abstract. Subscription, with a long history, is a popular business model that has been creating revenue for lots of companies. There are subscription methods with different features in markets nowadays. However, there is no clear evidence of how the merchandise associated with the subscription would affect consumer behavior. In this research, we focus on two popular features of subscriptions, removing advertisements and providing better services. Then explore the relevance of different merchandise and consumer behavior through the survey. Based on descriptive statistical methods to analyze consumer subscription consumption preferences, this article quantitatively analyzes the factors influencing the loss rate of subscriptions using econometric models. We find that advertising can reduce subscriber churn rates, leading to increased revenue and user loyalty with effective ad strategies. This suggests that consumers may be more averse to losing existing features (ad-free viewing) than gaining additional ones. Loss aversion might potentially play a role in consumer preference.

Keywords: Subscription, Consumer behavior, Advertising, Loss aversion

1. Introduction

Subscription, a concept originated in the 17th century UK, where individuals known as subscribers would offer authors financial backing in different quantities to assist in the printing of publication books. The subscription model has been widespread in several industries, with the publishing business being particularly notable in the 20th century. As time passes, the characteristics of subscription, allowing regular fixed payments in exchange for continuous access to online services and products, will enable it to become the most popular payment method for online services and products, which has represented an estimated 2.7% of consumers' total wallets [1]. Major industry giants in many regions, such as Sony, Patreon, Microsoft, and YouTube, utilize subscriptions as their main business model. In the financial year 2023, Sony's PlayStation Plus, a monthly subscription service, accounted for 12.87% of its total income from game and network services sector sales [2]. Platforms that offer subscription services typically improve the quality of their services and give additional features that are only available to paid customers as a benefit. Netflix, as one of the leading platforms, depends on premium subscribers who stream video to earn income.

Meanwhile, several platforms boost their income and user subscriptions by including advertisement. Specifically, non-subscribed users are required to view the ad during enjoying the free

services provided by platform, while subscribed users can avoid those disturbing commercials. YouTube would be one of the representatives among these platforms. This delineation results in a notable disparity between the experience of subscribed and unsubscribed users. As an increasing number of companies such as Amazon, Apple, Disney, and others introduce their subscription platforms, subscription had already become a common payment method on digital goods and services. Leader companies are providing two different subscribing models toward consumer and seems that there is not a common choice on which model is better by the point of views from companies. As subscribing usually produce long term return, we would like to determine which methods are most effective in retaining consumers.

Moreover, some scholar claims that subscription allows customers to become greatly attached to using the service and, therefore, more likely to extend by signing an agreement for the next period close to when the current deal expires [3-4]. As time passes, technology and business were evolving. To earn more revenue, companies had developed different ways to attract potential customers. Unfortunately, past papers have not made research on the real merchandise of subscribing, for example. We were curious on what really attract consumer click on that subscribing button season by season.

This paper explores the consumption preferences of subscribers. And through a questionnaire survey, analyze the changes in subscribers' choices in the next subscription cycle after providing two subscribing models to respondents. A simplified version with fewer service and an advertised version with advertisement to subscribers, in order to explore the influencing factors of subscriber churn rate, and further explore consumers' loss aversion.

The study is organized as follows: Section 2 reviews the literature, summarizing major survey databases, and the relationship between subscription and consumer behavior. Section 3 outlines the key variables, data sources, and regression model. Section 4 presents an empirical analysis of the relationship between subscription churn rates and external factors. Section 5 offers the conclusion of the whole paper.

2. Literature review

Clapp [5] first introduced the concept of subscription as a method through which subscribers offered authors varying amounts of upfront financial support to facilitate the publication of books. Cachon and Feldman [6] claim that subscriptions would be more effective at earning revenue and show that the absolute advantage of subscription pricing relative to per-use pricing can be more substantial than per-use pricing.

Chen [7] studies the benchmark case with no free trial for each scenario derives equilibrium results with free trial promotion and provides useful managerial insights for online content platforms when considering their subscription strategies. Thøgersen [8] executed a field experiment in which participants were offered a complimentary one-month trial. The trial led to an increase in the user number of the services being examined. Although the impact waned after the expiration of the promotional offer, its persistence was observable even five months later.

The focus of this research experiment is to explore the effects of altering the content of a subscription service and introducing a free-use model after the subscription cycle ends. Specifically, the study aims to understand the impact of these changes on subscription numbers and user retention among individuals who have previously used the services. In the experiment, participants were required to fill in a questionnaire. After finishing questions on basic information, participants had to go through two scenario questions, so that we could observe the actual responds of participants while facing realistic selection. Assuming the respondent had already started their subscription service before the experiment start, and they are going to face the situation that the services owner started providing a

free model to its user. By comparing the differences of churn rate in these scenes, we could have a brief estimation of consumer choices.

In this paper, we study the influencing factors of subscriber consumption preferences and subscriber churn rate. We collected personal characteristic data, electronic product usage characteristic data, and 440 valid questionnaire data from the WJX.cn platform by sending and collecting questionnaires. We conducted quantitative analysis on the personal characteristics, electronic product usage characteristics, and responses to subscription questions made by the respondents in our designed experiment.

3. Methodology

3.1. Sample size

The sample was collected from the Chinese survey platform, WJX.cn. We posted the survey on 19th July 2024. It is a weekend in the middle of the month with no surrounding public holidays, which helped us avoid potential influence and collect more data. Moreover, that would effectively reduce the external impact on our participants from most of the monthly subscription services, since they were charging their fee around the beginning or end of the month. The survey was written in English to ensure that ambiguity will not be caused while translating. We have spread the survey through the internet. Finally, 450 questionnaires were collected until the paper was written on 21st July 2024. Most of the survey was filled by the students of Jinan University and Chinese internet users. While the questionnaire was being posted, we set a minimum valid answer time to 10 seconds to ensure that the respondents read and completed the questionnaire carefully. Until the collection was stopped, a total of 450 questionnaires were being collected and 440 of them were valid, with an effective rate of 97%.

3.2. Survey

Our survey aims to investigate whether or not users continue their subscriptions in different situations. We simplified the problem with two multiple-choices questions instead of using a field test, so that more data can be collected in less time, and the sample size is representative enough. In this survey, the main question is about the consumer choices in situation of reducing advertisement or gaining more services. And there are some questions involving in personal habits and characteristics, which helped us better develop mathematical model to gain further conclusion.

Before respondents were questioned, they would be informed that the questionnaire was anonymous and their information was confidential, it would only be used for research purposes so that we could receive informative data. As written in the section 3.1 Sample size, the questionnaire was proposed in China, while the survey was written in English instead of Chinese to avoid translation problems. And it contained 10 questions with some of them mentioning complicated situation questions, the completion time is expected to be about 2 minutes. Predicting the using time helps us set a filter. Secondly, we will obtain their characteristic data through the following four multiple-choice questions which are about age, gender, education, and monthly disposable income. Then collect data on the characteristics of respondents' electronic product usage through three multiple-choice questions which are about the daily using electronics time, the services used, the average amount spent on monthly subscriptions, we have set 100 Yuan as the highest spending on subscription monthly, as Chinese citizens expend 100 yuan on educational, cultural and entertainment in 2022 [9]. And one scale question which is about familiarity with the subscription system by scoring according to degree 1-10, where 1 means no familiarity at all; and 10 means the most familiar. The full questionnaire can be found in appendix.

3.3. Procedure

Before the experimental section begins, we inform the respondents that this experiment is simulating the real purchase scenario so that we can better simulate accurate consumer choices in their daily life after carefully considering the different features and details of each option. Their choice helps us understand the decision-making process when facing different product features. The experimental part is being divided as two questions. The first one assumes that they use a paid subscription service for video software in the first month. One month later, the video platform launched a free usage mode: they can use the software for free but need to watch a 15-second advertisement before watching the video and cannot skip it. Or they can still choose the subscription model of 10 yuan per month. In subscription mode, they don't need to watch ads before the video starts. Respondents imagine actions they are taking while there will be a free model. Three options were given in the questionnaire: stop using the software with such changes, continue to use the software and keep subscripting the services of removing advertisement or switch to use the free software with advertisement. The second question which is independent of the first question. Respondents are assuming that they use a paid subscription service for video software in the first month. One month later, the video platform launched a free usage mode: they can use the software for free, but they cannot enjoy higher clarity, early access privileges, and identity privileges. They can still choose the subscription model of 10 yuan per month to continue to have these services. Respondents imagine actions they are taking while there will be a free model. Three options were given in the questionnaire: stop using the software with such changes, continue to use the software and keep subscripting to enjoy more services or switch to use the free software with worser services comparing to subscription version. The subscription churn rate is equal to the sum of the number of respondents who choose the free mode and stop using the service option in these two experiments divided by the total number of respondents.

3.4. Variables

Descriptive feature statistics were conducted on the personal attribute characteristics and electronic product and subscription data of the sample, as shown in Table 1. From Table 1, it can be seen that females account for 51.82% and males account for 41.09%. The distribution of males and females is relatively even, with slightly more females than males. The majority of the surveyed population is aged 20-30, accounting for 47.05%. 61.14% of the respondents have a college degree or above.

As each participate respectively answers the question for control group and question for treatment group, we therefore use the sample twice and then generate a dummy variable Advertisement to identify the effect of treatment in the regression model.

Table 1. Summary statistics

	Observations	Mean	Standard deviation
Characteristics			
Age			
<10	13	0.030	0.170
10-20	121	0.275	0.447
20-30	207	0.470	0.500
>30	99	0.225	0.418
Gender (Male=1)	440	0.482	0.500
Education (College or above)	440	0.611	0.488
Monthly disposable income (Yuan)			
<1000	29	0.066	0.248
1000-3000	109	0.248	0.432
3000-5000	128	0.291	0.455
5000-10000	126	0.286	0.453
>10000	48	0.109	0.312
Habits			
Daily using electronics time (Hour)			
<1	24	0.055	0.227
1-3	143	0.325	0.469
3-5	169	0.384	0.487
5-7	70	0.159	0.366
>7	34	0.077	0.267
The services have used (multiple options)			
Short video / video platform	159	0.361	0.481
Streaming platform	135	0.307	0.462
Over-the-top media services	111	0.252	0.435
Video games	153	0.348	0.477
News service	135	0.307	0.462
Office-software	160	0.364	0.482
Crowdfunding platform	145	0.330	0.471
Familiarity with subscription systems (1-10)	440	7.393	1.549
Average amount spends on monthly subscriptions (Yuan)			
0	18	0.041	0.198
0-50	212	0.482	0.500
50-100	178	0.405	0.491
>100	32	0.073	0.260
Outcome with advertisement	400	0.91	0.29
Outcome with services	376	0.85	0.35

3.5. Model specification

Considering that the explained variable loss rate of subscription is ordered scattered data, the ordered Probit model is used in the estimation method [10]. In order to study the impact and mechanism of subscription methods on Loss rate of subscription, the following verification model is set up:

$$LRS = \alpha + \beta sm + \gamma control + \mu \tag{1}$$

Where LRS represents the loss rate of subscription of the object under investigation; sm represents subscription methods, control represents other control variables; μ represents random interference items; α, β, γ represents the regression coefficient.

4. Results analysis

Table 2 shows the main results of the analysis. While control group was introduced with a free using method with fewer services, the treatment group was introduced with a free using method with advertisement. As shown in column (1), with treatment applied and neither the characteristics nor habits of respondents were controlled, the treatment leads to a reduction in the share of individuals who do not subscribe by 27.9 percentage points at 5 percent significant level. This result is robust to adding individual controls in column (2), the effect of treatment remains significantly negatively related to loss rate of usage. And the same situation also happens while adding indicators of habits (column 3), the reduction in loss rate of usage increase to 29.9 percentage points at 1 percent significant level. Reassuringly, the main effect continues to hold (and slightly increases). The reduction of loss rate of usage is 30.5 percentage points at 1 percent significant level when controlling for both sets of variables (column 4).

Comparing to the control group, these negative coefficient shows that, introducing advertisement as the main merchandise could better attract consumers remain using the services. Controlling the personal characteristics in this model, the effect of advertisement on loss rate of subscription is slightly higher than without controlling, may be attributed to the substantial influence of personal characteristics and habits on the relationship between advertisement and loss rate of subscription.

Table 2. The effect of advertisement and services on subscription

	Dependent variable: Loss rate of subscription			
	(1)	(2)	(3)	(4)
Advertisement	-0.279**	-0.288**	-0.299***	-0.305***
	(0.111)	(0.114)	(0.116)	(0.118)
Characteristics	No	Yes	No	Yes
Habits	No	No	Yes	Yes
N	880	880	880	880

Notes: All columns are estimated using Probit regression model. *** for p < 0.01, ** for p < 0.05, and* for p < 0.1. A full table with estimated coefficients for all controls can be found in Appendix Table.

5. Conclusion and discussion

As existing literature had already analyzed the behavioral intention of online subscribers, but they did not focus on the effect advertainment on merchandise too much. This paper presents evidence on the question whether consumers perform differently while facing different bonus associated with

subscribing button. The comparison on consumer behavior is important for any company that is going to propose their own subscribing product or services, as the data basically fit the realistic market environment.

YouTube Premium and Spotify, which are the most popular over-the-top media service subscription services, have proven that even by simply removing advertisements, they can still attract lots of customers. The platform can generate revenue through subscription fees as well as by monetizing advertisements. As it appears as usual as it can, people may get adaptive bias on watching advertisement. The acceptances could grow much higher than it was. Comparing a suitable advertisement may help company gaining more revenue.

In this paper, we used 440 valid responds obtained from the WJX.cn platform to quantitatively analyze the factors affecting subscriber consumption preferences and subscriber churn rate through responses to subscription questions via using probit regression analysis method. The personal characteristics of respondents and electronic product usage characteristics would be the control variable of the experiment using probit regression analysis method. By introducing a usage model that offers free but requires ad. viewing to subscribers, the churn rate of subscribers can be reduced by 30.5% with controlling habits and characteristics.

For the potential reason of why advertisement can better attract consumer while more services do not perform well, loss aversion could be the main reason behind this abnormal consumer behavior. Loss aversion is to be ubiquitous, applying to many types of goods and risks [11]. It should be noted that there are limits to loss aversion. We suggest that companies which is willing to introduce subscription system should set advertisement with an appropriate amount. Based on the theory, advertisement could be seen as a kind of well-being loss that users used to take the free-ad version. Then to maintain the original well-being, users may choose a subscription model to remove advertisements.

However, as subjective bias may happen while respondents answering questionnaires. To avoid possible deviation, we only set up a simple test on the consumer behavior. And participants would only answer the questions that could be simplified as dummy variables in regression analysis, which could only show the choice of consumers. To better illustrate the difference, further study can be focused on establishing a model of the accurate influence of advertising through field experiment.

In this paper, data was mostly collected by survey. To observe how consumer behave, we have created complicated situation in the form of questions. This experiment could not reflect the realistic performance of churn rate with time changes. We suggest further field experiment can be made to gain more accurate data.

Acknowledgement

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Appendix

Consumer Subscription Mode Selection Survey Questionnaire

This questionnaire is anonymous, so please answer truthfully. All the information is only for research, and the information is absolutely confidential. Thank you for your sincere cooperation!

This questionnaire contains 10 questions, and the completion time is expected to be about 4 minutes.

1. Your age:

○0-10

○10-20

○20-30

○above 30

2. Your gender at birth

○male

○female

3. Your Education: (currently in the process of obtaining, or atready obtained)

○High school or below

○College or above

4. Your monthly disposable income:

○Below 1,000 yuan

○1000-3000 yuan

○3000-5000 yuan

○5000-10000 yuan

○Above 10000 yuan

5. The average amount of time you use your electronics every day:

○Less than 1 hour

○1-3 hours

○3-5 hours

○5-7 hours

○More than 7 hours

6. Please select the types of service you have used :

□Short video / video platform

□Streaming platform

□OTT terrace

□Video games

□News service

□Office-software

□Crowdfunding platform

7. Are you familiar with the subscription system?(Score according to degree 1-10, where 1 means no familiarity at all; and 10 means the most familiar)

8. The average amount you spend on monthly network subscriptions:

○0 Yuan

○0-50 yuan

○50-100 yuan

○Above 100 yuan

Dear participants,

Thank you for participating in this selection experiment. In this experiment, we want you to simulate the real purchase scenario as much as possible, just as you make choices in your daily life. Please carefully consider the different features and details of each option.Your choice helps us understand the decision-making process when facing different product features.Note that this is not just a simple choice question, but a process that simulates your real shopping experience.

9. Assuming that you use a paid subscription service for video software in the first month.

Period	First month	Second month	
Pay mode	Subscribe	Free	Subscribe
Price	10 Yuan / month	0 Yuan / month	10Yuan / month
Video content	☑	☑	☑
Advertisement	✖	☑	✖

One month later, the video platform launched a free usage mode: you can use the software for free, but you need to watch a15 second advertisement before watching the video and cannot skip it. You can still choose the subscription model of 10 yuan per month. In subscription mode, you don't need to watch ads before the video starts.Please imagine what model you will choose in the next month.

○Continue to use the subscription software, without advertisement

○Switch to use the free software, with advertisement

○Stop using the software entirely

10. Assuming that you use a paid subscription service for video software in the first month.

Period	First month	Second month	
Pay mode	Subscribe	Free	Subscribe
Price	10 Yuan / month	0 Yuan / month	10 Yuan / month
Video content	☑	☑	☑
High clarity	☑	✖	☑
Identity privileges	☑	✖	☑
Early access privileges	☑	✖	☑

One month later, the video platform launched a free usage mode: you can use the software for free, but you cannot enjoy higher clarity, early access privileges, and identity privileges. You can still choose the subscription model of 10 yuan per month to continue to have these services. Please imagine what model you will choose in the next month.

○Continue to use the subscription software, with original services

○Switch to use the free software, with fewer services

○Stop using the software entirely