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Identifying Online Streaming User Value in the Netflix Recommendation System

A Thesis

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of

Drexel University

by

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requirements for the degree

of

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ABSTRACT

Identifying Online Streaming User Value in the Netflix Recommendation System

Jingyu Yan

Netflix is one of the most successful providers of Over-The-Top content, delivered via the internet. By using a massive amount of data generated by its streaming users, a personalized recommendation system is one of Netflix's value propositions. However, due to a lack of publically available data and studies, it is difficult to determine whether its recommendation system has brought true value to streaming users, and how important this feature is to its users.

The purpose of this study is to evaluate the recommendation system from the streaming users' point of view. By collecting survey results from 119 participants, this study will attempt to reveal the relationship between streaming users and the personalized recommendation system, and to show whether or not streaming users are satisfied with this feature.

Keywords: OTT; Netflix; Personalized recommendation system

CHAPTER 1 INTRODUCTION

1.1 Introduction

Traditional broadcast and cable television has gradually been losing audience. In the 1980s, more than 90% of viewers were tuned in to one of the Big Three networks (ABC, CBS and NBC) during primetime. (Hindman & Wiegand, 2008) However, by 2005, the average primetime share of the Big Three networks had fallen to 32% (Hindman & Wiegand, 2008).

With the growth of technology and rise of internet usage, new media platforms have been gaining popularity and challenging traditional broadcast and cable television. A study conducted by the Leichtman Research Group revealed that, in 2014, over three quarters of US households had On Demand TV via DVR, Over-The-Top or Video on Demand. (Leichtman Research Group, 2015).

OTT service is a prominent new media platform. Over-the-top is a term used for audio, video or other types of media content delivery via the internet, without requiring the audience to have a traditional cable or satellite pay-TV subscription (Patel, 2015) and without involvement of a multichannel video program distributor (MVPD) in control of content distribution. A research study conducted by The Diffusion Group estimated that there were 90 million households internationally using OTT services at the end of 2011; by 2016 there will be over 250 million household OTT users (Reedy, 2011). According to research by Arthur D. Little, a global management consulting company, OTT TV and video in North America was a mere two to three billion dollar market in 2011(Taga, 2012), but had reached more than 18 billion in 2016, and was expected to generate approximately 26 billion by 2021 (Digital TV Research, 2017). Moreover, PR Newswire's 2015 *Global Online TV & Video Revenue Forecasts* suggests faster growth by

estimating global online TV and video revenues (over fixed broadband networks for 51 countries) will reach $42.34 billion in 2020 (Global online TV and video revenue forecasts, 2014). A Global OTT TV &Video forecast by Digital TV Research forecasted that Global OTT TV & Video revenue (covering 64 countries) would reach $51.1 billion in 2020.

OTT services provide audiences with much more flexibility to consume content compared to traditional broadcast and cable television services. The emergence of OTT service provides audiences with dynamic ways to consume content whenever and wherever they prefer. While traditional broadcasters need to be concerned with program scheduling to maximize ratings and shares, OTT services have no schedules at all (Thomas, 2015). OTT services give control to audiences and allow them to pause, rewind and fast-forward or to binge watch a series of shows. The lucrative OTT market also attracted HBO to launch its direct-to-consumer service in April 2015. Since then, content owners such as CBS, Showtime and pay-TV providers like Verizon and Dish have introduced their own OTT services (Granados, 2016).

In terms of total subscribers, international expansion and total market share, Netflix is one of the most successful OTT services (Wilhelm, 2017). By the end of November 2016, the number of paying Netflix subscribers in North America was reported to be over 53 million, and is expected to reach 59 million by 2020 (Digital TV Research, 2017). In the international market, by the end of the second quarter of 2017, Netflix had 103.95 million streaming subscribers worldwide. In comparison, Hulu and Amazon Video subscribers reportedly reached 12 million and 40 million, respectively. PricewaterhouseCoopers's data also show that 65.1 percent of US OTT users used Netflix in 2015, where 34.2% of the users used Amazon Video, 16.3% and 14.9% of OTT users used Hulu or HBO Go, respectively (PwC, 2015).

Netflix streamers spend much more time using the service than other OTT streamers. Downstream traffic measures the data that is received by a computer or network simply by visiting a website. According to Sandvine Inc's Global internet Phenomena Report, Netflix accounts for 34.2 percent of internet traffic during peak evening hours in North America, compared to YouTube's 13.2 percent market share. Amazon and Hulu each accounted for 1.9% and 1.7%, respectively (Stenovec, 2014).

1.2 Background

Founded on August 29, 1997 in California by Marc Randolph and Reed Hastings, Netflix started as a DVD rental and sales business. Within two years, Netflix introduced a monthly subscription-based business model and launched a single-rental model in 2000 (Keating, 2012). In 2007, as a complimentary service that complimented its DVD rental and sales service, Netflix introduced an instant viewing service (Keating, 2012). With only 1,000 titles available, Netflix offered a limited number of hours for streaming at a price of $5.99 for 6 hours, and $17.99 for 18 hours (Anderson, 2007). Within a year, the online streaming service grew popular with customers leading Netflix to refocus and expand their business more on the online streaming service (Cook, 2014). In 2010, Netflix finally decided to also offer a streaming subscription that allowed subscribers to have unlimited viewing for $7.99 per month (Cook, 2014) and reached 20 million subscribers in the US (Melanson, 2011). Moreover, in the same year, Netflix began its global expansion by launching the service in Canada, followed by the United Kingdom, Ireland, the Nordics, the Netherlands, and Latin America (Cook 2014).

On January 25th, 2012, Netflix premiered *Lilyhammer,* a co-production between Netflix and Norwegian public television, marking the first-time Netflix offered exclusive content (Greene, 2013). Netflix released all eight episodes of the series on the same day, which has

become a standard release strategy for Netflix (Cook, 2014). Netflix made it clear that the company had a major plan for original programming when all 13 episodes of their first exclusive original series *House of Cards* became available on February 1, 2013 (Bishop, 2013). With a budget of $100 million for 2 seasons, a 26 episode remake of BBC's House of Cards, CEO Reed Hastings said, "This could be a defining moment in the development of internet TV." (Bishop, 2013). The release of original programming contributed to subscriber growth. By the end of 2012, Netflix's had 27.1 million total subscribers in the US , and the number had a dramatic increase by over 6 million to reach 33.4 million by the end of 2013, the year House of Cards was released (Cook, 2014).

A personalized recommendation system has become a value proposition for Netflix's core business (Liftigniter, 2016). Netflix collects massive amount of data from streaming users every day, enabling them to learn and to subsequently target each individual streamer's taste. Jonathan Cohen, principal brand analyst of Amobee pointed out that using machine learning and analytics to understand audiences contributed largely to Netflix's success (Markman, 2017).

1.3 Statement of the problem

One of the major competitive advantages that contributed to Netflix's success was personalization (Victor, 2007). Without a slogan or any focus on specific genres, when questioned about Netflix's brand personality, Ted Sarandos, company's head of content, pointed that "Our brand is personalization.", specifically targeting video recommendations (Liftigniter, 2016). Netflix uses data not only for making decisions about which projects to green light, but also for improving its individual recommendation system. Massive amount of user data helps Netflix to gain insight on user content preferences and viewing habits.

OTT doesn't have a standardized rating system unlike traditional linear TV which utilizes Nielsen. Netflix, especially, is known for keeping its viewership and rating data confidential. This is because Netflix does not want to disclose such proprietary information, but also, there is no need for the company to care how much they can sell to advertisers (Mittell 2016). Therefore, lacking first-party data, it is difficult to measure how satisfied streamers are with personalization.

1.4 Purpose of the study

Netflix tends to keep its data private, and has released very little to the public. In addition, there have been few studies and research, with limited availability, conducted by marketing and consulting companies to overview the entire OTT market and Netflix's performance. However, a few of them have looked into the performance of Netflix's personalization feature. By collecting and evaluating first-hand data from actual Netflix streaming users, this study plans to provide more insight into the relationship between the viewer/user and Netflix's recommendation system, and an overview of user satisfaction regarding the recommendation system.

1.5 Hypotheses

Hypothesis 1: For users, Netflix's personalized recommendation system is one of its most valuable features.

Hypothesis 2: Before choosing new content to watch, consumers usually check the personalized recommendation list.

Hypothesis 3: The recommendation system is a valuable feature for streaming users' overall Netflix experience.

1.6 Research Questions

RQ1: Who are Netflix's streaming users and how do they access the service?

RQ2: How often do Netflix users access the service?

RQ3: Why did streaming users begin using Netflix?

RQ4: Do consumers always have a TV series/movie in mind before they log on to Netflix?

RQ5: How often do Netflix users go through Netflix's recommendation list before choosing new content to watch?

RQ6: How do Netflix users choose new content to watch?

RQ7: Do consumers think that Netflix identified their taste correctly?

RQ8: Overall, how satisfied are users with Netflix's recommendation system?

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

Netflix collects an immense amount of data from its streaming users regarding their viewing behavior and habits. According to Todd Yellin, Netflix's VP of Product Innovation, Netflix streaming users watch approximately 2 billion hours of content each month on the platform (Sweney, 2014). The viewing data generated by those hours give the company in-depth insights, such as what specific genres appeal to each individual streamer. The head of original content at Netflix, Cindy Holland said "We see everything our subscribers are watching. We can identify subscriber populations that gravitate around genre areas, such as horror, thriller and supernatural. That allows us to project a threshold audience size to see if it makes for a viable project for us." (Sweney, 2014)

Since subscription fees are the only source of revenue for Netflix, the company's main goal is to gain new and retain current subscribers. With insights of millions of users' viewing habits as its competitive advantage, the better Netflix demonstrates that they understand their viewers, the likelier viewers are to stick around. (Madrigal, 2014). One way to show how well Netflix understands their streamers is through the personalized recommendation system. In order to determine whether the personalized recommendation system can help the company to retain and grow its subscriber base, it is important to view the online streaming market in terms of user demographics and trends, as well as existing studies on how streaming users perceive Netflix. However, the following review shows that the current publically available data and research shows inconsistency and lack of perception from streaming users' perspectives when it comes to Netflix.

2.2 Who are the streaming users

According to Mintel's 2012 year-end Online and Streaming Video report, online streaming video usage is popular among internet users across all age groups from 18 to 65 (Hulkower, 2012). In 2012, Netflix is reported to have reached 32% of internet users over 18, and over 47% of the internet users between 18 and 24 (Hulkower, 2012). The following year's Mintel Streaming Media: Movie and Television report (2013) revealed that the usage of streaming subscription services had increased to 46% for internet users over 18. Netflix also reached 36% of internet users above 18, growing 4% from year 2012 (Hulkower, 2013).

Age is clearly the central driver for streaming usage. internet users between 18 and 24 consume an average of 3.7 hours of content on a weekly basis, while adults 55 and over only watch 1.6 hours of content per week (Hulkower, 2012). Similar results also can be found in Mintel's 2013 Streaming Media: Movie and Television report. In the amount of content viewed by different age groups, the 55 plus demographic consumes far less than those that are 18 to 34 (Hulower, 2013). The study also finds that 75% of the participants between 18 and 34 claimed they watch at least one professionally produced movie or TV show online in any given month. The usage falls to 49% for 35 to 44 and to 35% for 45 to 54 (Hulkower, 2013).

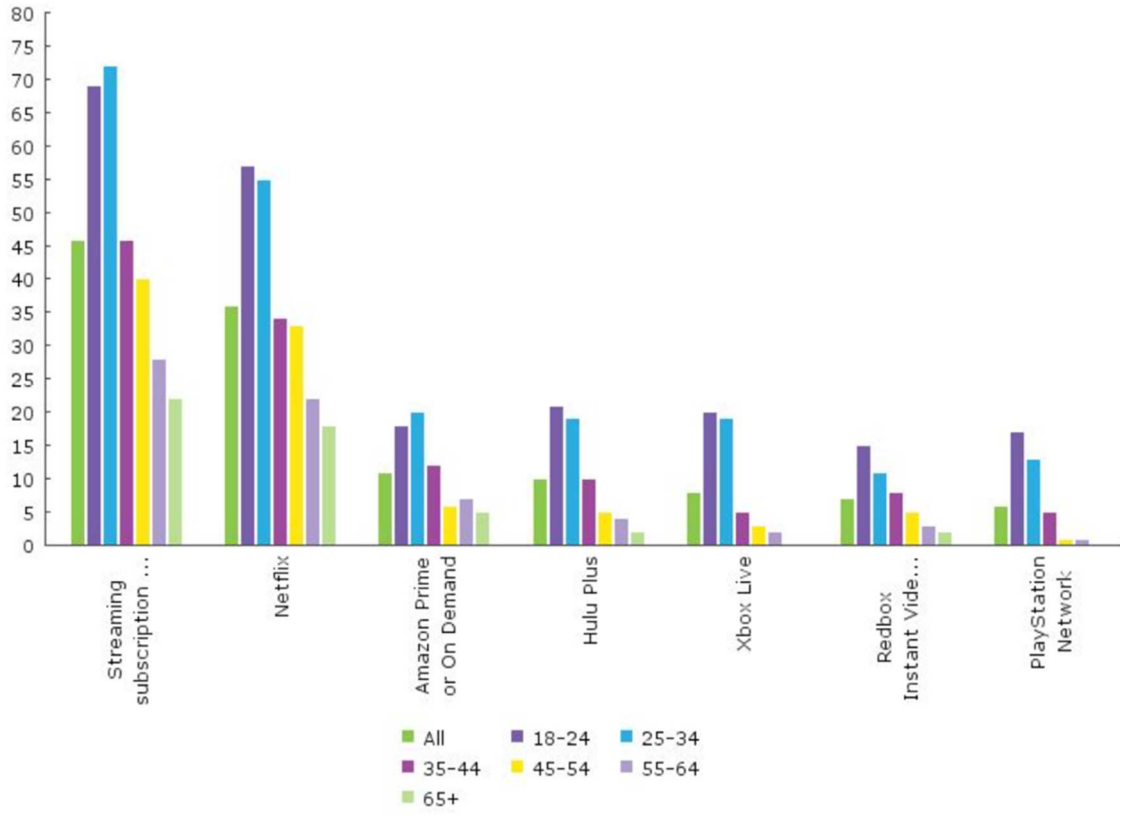

Figure 1Usage of streaming VOD subscription services, by age, September-October 2013 Source: Mintel

Mintel's 2013 report also suggests that subscriber growth for streaming services in general is more likely to come from younger age groups, given the fact that over 70% of streaming users 18 to 34 watched video content monthly using a subscription based service (Hulkower, 2013). With Netflix dominating more than half of the users between 18 and 34, this age group has significantly higher usage for each subscription based service as shown in Figure 1.

The above findings are not consistent with Nielsen data from its 2014 Cross Platform Report. Nielsen's age profile shows that 40% of online video users are 35 to 54; 30% of the online users are 55 and above, and only 12% of the users are 18 to 24 (Nielsen, 2014). Civic Science's May 2015 insight report on *Netflix's New Users* also highlighted the different findings.

The report looked at the demographics of three different segments: newly joined users, long-term users and potential subscribers. According to the data, long term users are younger, between 18 and 24, where recent subscribers are more likely to be between 35 and 54 (Civic Science, 2015). It is difficult to explain what caused these demographic differences due to lack of further information on the research methodologies, but these sets of research do not provide a clear image of online streaming users.

Breaking down demographics by gender, Mintel reports reveal that men showed higher usage of streaming video services. In their 2013 report, 27% of the male survey participants claimed that they used the internet to watch movies or television shows more than 6 hours in a given week as compared to 19% of female participants (Hulkower, 2013). The study suggests that men are not only more likely to own devices like gaming consoles that provide access to streaming service, but also more willingly to spend money to purchase video or to adopt new media trends early (Hulkower, 2013). The Mintel 2012 report shows similar findings where 21% of male survey participants are heavy streaming users as opposed to 14% of female participants (Hulkower, 2012). The 2016 Mintel reports also shows that females lag significantly behind males in streaming usage and spending (Hulkower, 2016). For instance, 66% of males in the 2016 survey use Netflix streaming, as compared to 60% of females; 39% of males reported using Amazon Prime video compared to 30% among females (Hulkower, 2016). Yet, those findings are once again in conflict with Nielsen's data which shows women having a higher percentage of online video usage at 53% (Nielsen, 2014). Civic Science's 2015 report supported Nielsen's finding with a 51% female and 49% male split (Civic Science, 2015).

The research findings on online video users' household income levels are also inconsistent. According to Nielsen data, households with income less than $50,000 had the most online video

viewers at 39%, while the percentage of users decrease as household income levels increase (Nielsen, 2014). On the other hand, the Mintel 2013 study shows that subscription services in general perform best in the middle-income group of $75,000 to $99,000 since this group has the discretionary income to afford multiple streaming service subscriptions (Hulkower, 2013). Netflix is in the leading position among any other subscription service across all household income groups. With 36% of the usage among all household income groups, it has more than three times the penetration of Amazon Prime Video coming in second in usage ranking (Hulkower, 2013).

Figure 64: Usage of leading streaming VOD subscription services, by household income, September-October 2013

"Which of the following subscription services, if any, have you used to watch a movie or a TV show in the past month?"

	All	<$25K	$25K-49.9K	$50K-74.9K	$75K-99.9K	$100K-149.9K	$150K+
Base: internet users aged 18+	2,000	363	446	395	274	359	163
	%	%	%	%	%	%	%
Streaming subscription usage	46	36	45	48	56	43	50
Netflix	36	28	37	36	47	33	37
Amazon Prime or On Demand	11	4	8	13	14	15	22
Hulu Plus	10	8	10	11	13	8	10
Xbox Live	8	5	7	9	14	6	7
Redbox Instant Video by Verizon	7	7	7	10	9	5	4
PlayStation Network	6	6	5	8	9	2	5

Figure 2 . Usage of leading streaming subscription services, by household income, September-October 2013 Source: Mintel

The 2016 Mintel study also reveals that low-income viewers lag in streaming use, which contradicts Nielsen's findings. A slightly higher rate of usage can be seen among households with income levels between $50,000 and $99,000 (Hulkower, 2016). But the study does point out the fact that this might be due to a larger number of young families within this middle-income group (Hulkower, 2016).

In general, there is no conclusion to be drawn from those studies. Even Mintel's 2013 report summarized that household income is not a useful segmentation for understanding the online video market since no significant trend can be seen.

2.3 How users find content

According to the Mintel's 2012 online and streaming video study, the top methods for finding content include viral word-of-mouth, and the video displayed on the homepage of streaming services' websites (Hulkower, 2012). The Mintel 2012 study found that approximately one third of study participants watch content from direct recommendation from people they know through a social network. In addition, about half of streamers liked to surf for content. The starting point of this browsing behavior is most likely to be the home page of the video sites where content is recommended based on previously viewed content, or other viral videos (Hulkower, 2012). For example, the YouTube home page, always recommends content based on the channel subscribed to, similar topics viewers have previously searched or trending videos. In the case of Netflix, this means half of the Netflix streaming users could potentially browse through the recommended list. This study also suggests that younger viewers between 18 and 44 are browsing for content more than older viewers. Younger viewers are more likely to share the video they enjoy with people they know, while older viewers watch more videos that are directly shared with them by family and friends but are less likely to recommend it to someone else (Hulkower, 2012).

Mintel's 2013 report also provides insight into user content discovery. The 2013 study supports the above findings. A recommendation system should be a powerful way to show the value of a content library as one third of the study participants browsed for content, while

another third go online when they already have a specific title in mind (Hulkower, 2013). This also means that, for those streamers who have specific title in mind, if the recommendation could potentially predict their desirable titles, the actual content library size would seem less important.

The 2013 study also reveals the way in which streamers search for content based on frequency of use. With over 6 hours of viewing per week, heavy users who stream a movie or TV show daily, are more likely to browse for content, and are more likely to have higher satisfaction levels with a recommendation system (Hulkower, 2013). However, the study did point out that it is easier for heavy users to find content they desire simply because they are interested in a wider variety of titles. Both heavy, medium (3 to 5 hours of streaming) and light (1 to 2 hours of streaming) users consistently use word-of-mouth for finding content. Over one third of users in each category are frequently getting recommendations about movies and TV shows from friends and families (Hulkower, 2013). As an online source for word-of-mouth recommendations, the Mintel report suggests that younger users (18-34) show much more engagement in discovering content via social networks. Social networks also have a higher usage among heavy streaming users; one in four heavy streamers in the study use social media for content discovery.

2.4 User Experience

As an online entertainment streaming service, ensuring strong demand for the service is crucial for Netflix's business since it relies on subscription fees as its sole source of revenue. Aside from the metrics like subscriber growth rates or cancellation rates, examining streaming users' satisfaction with the service from different aspects can provide the company with insight to predict future performance and business growth. Since Netflix launched its streaming service,

there is little available research that studied Netflix or overall OTT service providers' user experience.

Netflix seems to have more loyal subscribers than its competitors and tops the majority of user satisfaction rankings. According to a 2015 study conducted by Parks Associates, Netflix had the lowest cancellation rate among broadband households at 5% (including those subscribers who left after the end of their free trail) representing 9% of Netflix's subscriber base. Meanwhile, 5% of broadband households cancelled Amazon Video service which represented 19% of the user base, and 7% of broadband subscribers unsubscribed from the service representing half of Hulu's current subscriber base (Sappington, 2016).

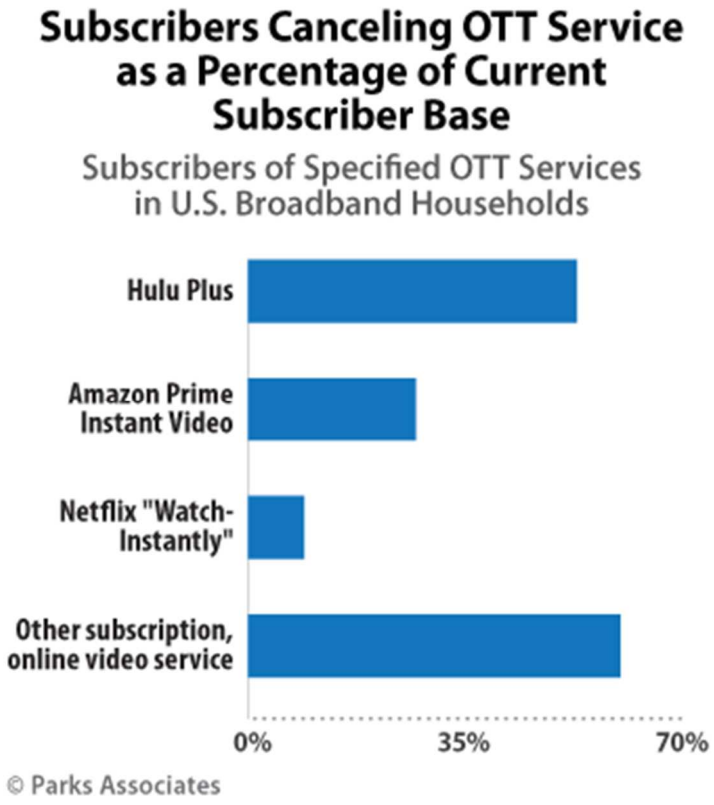

Figure 3 Subscriber canceling OTT service as a percentage of current subscriber base on July30, 2015 Source: Parks Associates

The study also found that 20% of U.S streaming users tend to cancel an OTT service within a year (Baumgartner, 2016). One of the causes of the cancellation rate is that most OTT services utilize an experimental "try before you buy" model that don't lock in consumers for long-term commitments (Baumgartner, 2016). In addition, the reason why Netflix can retain its subscribers is that they are loyal to specific content, as the company released 600 hours of original programming in 2016. Hulu's former head of customer service Michael Callahan also commented that creating blockbuster original shows that streamers can't live without is the surest way to keep them (McAlone, 2016).

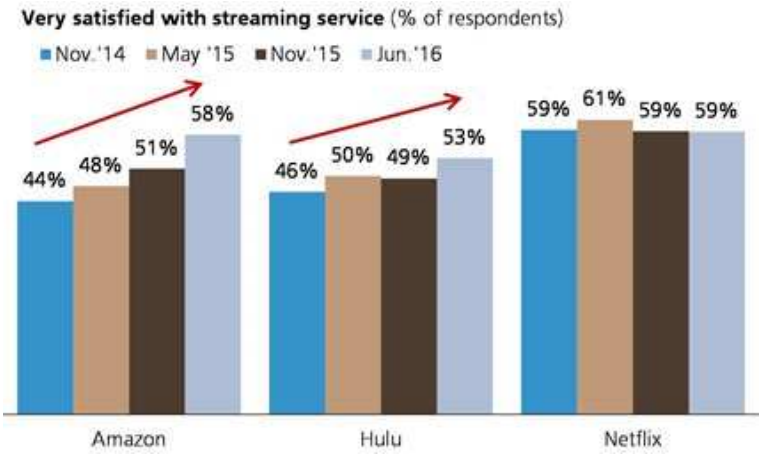

Figure 4 Subscriber canceling OTT service as a percentage of current subscriber base on July30, 2015 Source: Parks Associates

A study by global financial services company UBS's market research division reveals that Netflix remains at the top in user satisfaction (McAlone, 2016). However, as shown in Figure 4, competitors like Hulu and Amazon have gradually closed the gap. Moreover, since May 2015, Netflix's user satisfaction rate shows a 2% decline. The decline in user satisfaction

rate seems to be mainly due to the increase in monthly subscription fees in May 2015 (Owens, 2016).

Table 1 Where do you go most frequently when you want to watch a TV show? On May 18, 2016 Source: E-Poll Market Research

VIEWING SOURCE	Total	Teens 13-17	Young Millennials 18- 24	Older Millennials 25- 34	Gen X 35- 54	Baby Boomers 50- 54
Netflix streaming subscription	**33%**	**39%**	**51%**	**34%**	**25%**	**24%**
A TV channel during its original air time	16%	11%	7%	13%	22%	21%
DVR or TiVo Service	15%	6%	6%	15%	20%	21%
Hulu (paid) subscription	7%	5%	7%	9%	7%	6%
YouTube	7%	17%	10%	6%	4%	4%
Online, on a free site	4%	9%	5%	3%	3%	3%
Amazon Prime subscription	3%	1%	2%	2%	4%	4%
VOD (Video on Demand)	2%	1%	1%	3%	3%	2%
All other sources (14 choices)	13%	12%	11%	16%	13%	15%

A national study conducted by E-Poll Market Research examined content consumption by different demographic groups. The results reveal that Netflix is the most frequent choice for all demographics (E-Poll Market Research, 2016). Among 1,488 survey participants from 13 to 54 who had watched at least one full-length streaming program within 6 months prior to the study, Netflix scored twice as high as live TV, which ranked second. Meanwhile, Netflix's direct competitor Hulu was in 4th place and Amazon video ranked 7th (E-Poll Market Research, 2016). Global marketing information services provider, J.D Power studied overall user satisfaction by examining six different key factors; performance and reliability, content, cost of service, ease of use, communication, and customer service (Effler, 2016). On a 1,000-point scale, Netflix ranks highest among all OTT service providers with an overall 829 score (Effler, 2016). The study also

found that Neflix topped in five of the six key factors, performing particularly well in performance and reliability and in customer service (Effler, 2016).

2.5 Conclusion

This chapter examined previous studies and research regarding the OTT market in general, in terms of streaming user demographics and trends. It identified Netflix's position in the OTT market. In the first section, it revealed that age and gender play vital roles in affecting streamers' viewing behaviors. Data indicate that, among most age and gender groups, Netflix is in the leading position of attracting streaming users. However, not all study results are consistent in terms of age profile. This chapter also reviewed how streaming users discover content. Research indicates the importance of word of mouth and social media recommendations on content discovery among streaming users. Finally, there are several studies conducted by different research groups to assess the major OTT services from a users' point of view. Overall, Netflix topped most of the satisfaction rankings. Yet, most of the studies only look at the services in general, and lack insight and details on streamers' perceptions towards its different features.

CHAPTER 3 METHODOLOGY

This study is designed to examine Netflix streaming users' habits, preferences, and opinions on the Netflix recommendation system via survey, to determine how effective and useful the recommendation system is to the subscriber.

The following hypothesis and research questions will be addressed in this study:

Hypothesis 1: For users, Netflix's personalized recommendation system is one of the most valuable features.

RQ1*: Who are Netflix's streaming users? And how do they access it?*

RQ2*: How often do Netflix users access Netflix?*

RQ3*: Why did streaming users began using Netflix?*

Hypothesis 2: Before choosing new content to watch, consumers usually check the personalized recommendation list.

RQ4*: Do consumers always have a TV series/movie in mind before they log on to Netflix?*

RQ5*: How often do Netflix users go through Netflix's recommendation list before choosing new content to watch?*

RQ6*: How do Netflix users choose new content to watch?*

Hypothesis 3: The recommendation system is a valuable feature to streaming users' overall Netflix experience.

RQ7*: Do consumers think that Netflix determined their taste correctly?*

RQ8*: Overall how satisfied are users with Netflix's recommendation system?*

3.1 Setting and participants

Survey: This is a quantitative study. The survey was created via Qualtrics, an online survey tool, to reach the targeted sample population. The survey contains sixteen questions (11 multiple choice questions, one ranking question, three rating-scale questions and one open ended question). Sixteen survey questions can also be categorized into behavior, perception and category questions. Behavior questions were asked to observe participants' past behavior or response to given situations/assumptions.

Followings are the behavior questions in the survey:

Q1: How do you access Netflix?

Q2: What device do you use to access Netflix?

Q3: Why did you begin using Netflix?

Q4: How often do you use Netflix streaming?

Q5: Do you always have a show in mind before accessing Netflix?

Q6: How often do you go through Netflix's recommendation list before you choose new content to watch?

Q7: How do you usually choose a new show to watch after finishing current viewing content?

Q8: Have you ever watched a show that Netflix recommended to you?

There are two perception questions in the survey. Perception questions were asked to identify how participants measure the extent to which such perceptions affect their own behaviors and attitudes in the given assumptions. In this study, the following two questions can be used to gain better understanding of how valuable the Netflix recommendation system is to them and how those values could affect their behaviors.

Q9: Please rate the Netflix system to the value of your Netflix access.

Q10: How appropriate would you say Netflix's recommendations have been to your viewing preferences?

Q11: Do you have any other thoughts regarding the Netflix recommendation system?

The last type of question is categorical. Demographic questions were asked to divide the data into various groups. Then, the study could create data analysis in the form of cross tabulations to compare behavioral and perceptional data across multiple demographics. The survey collected the following aspects of demographic data:

Gender

Age

Educational level

Household income

Question 16 in the survey is an open-ended question. Giving participants the freedom and space to express their perception toward the Netflix recommendation system in as much detail as they want, this question was used to gain more accurate insight as well as some unique and unexpected opinions.

3.2 Participants

The data was collected via a Qualtrics survey that targeted Netflix users, also including users who had unsubscribed from the service. The study mainly targeted US Netflix users. The participants were contacted via the snowball method using sites such as Facebook, Twitter, LinkedIn, Reddit and Amazon Mechanical Turk. Reddit is an online discussion forum website that all registered users can submit and comment on various topics. The survey link was mainly

posted on subreddit /r/television, /r/Netflix and /r/NetflixBestOf since the users in these niche forums are the study's targeted sample population. Amazon Mechanical Turk is an online marketplace that allows users to post Human Intelligence Tasks (HIT) and to recruit 'workers' to complete the task in exchange for payment. In this study, 50 out of 119 total participants were recruited on Amazon Mechanical Turk and monetarily compensated at a rate of $0.10 per person.

3.3 Measurement Instrument

The study used quantitative analysis. Based on the survey data collected from the participants, those data will attempt to reveal that Netflix's recommendation system is effectively and frequently used by its viewers. It is this study's goal to also observe to what extend the data-driven recommendation system is valuable for Netflix users.

3.4 Limitations:

The author acknowledges a few limitations to this study. Although the survey was distributed via the internet to Netflix users worldwide, it was restricted to those who could understand English and only available for those who have internet access. Therefore, the demographic of the participants might not fully reflect Netflix streaming user demographics. In addition, due to the subjective nature of perception questions, reliability should be considered. The survey data cannot reliably identify if a participant was being accurate, honest or truthful in his or her response to a subjective experience or perspective.

CHAPTER 4 RESULTS

4.1 Introduction

Based on the data collected via an online Qualtrics Survey, this chapter shows the answers to the research questions listed in Chapter 3.

4.2 Results

4.2.1 Research question 1: Who are Netflix streaming users? How do they access it?

Demographics

119 respondents completed the survey; 55 males (46.2%) and 64 females (53.8%).

The participant's age is heavily skewed toward millennials, as 77.8% of the participants were between 18 to 35 years old. Among the millennial participants, those between 18- 24 and 25-34 have equal numbers of participants. Participants' median age is 24 and average age is 26.7. The youngest participant was 18 while the oldest was over 55.

In terms of participant educational level, 20% of the participants had middle or high school or some college, and 47 out of 119 (39%) of participants had college-bachelor or higher degrees; 41% of the participants had advanced degrees.

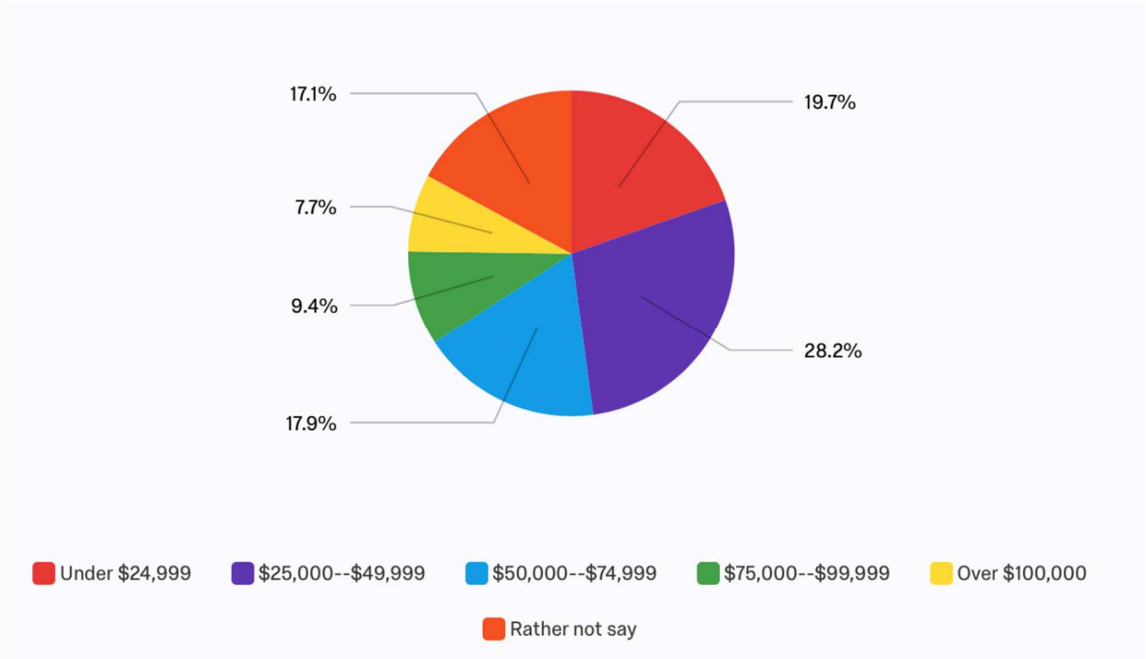

Figure 5 Participants household income

This graph displays the income breakdown including those participants who chose to opt out. Of those who chose to disclose their income level (n=119), 19.7% indicated their annual household earnings were under $24,999; 28.2% reported between $25,000 to $49,999, 17.9% reported between $50,000 to $74,999, 9.4% reported $75,000 to $99,999, and 7.6% of the participants have household income over $100,000.

Netflix access

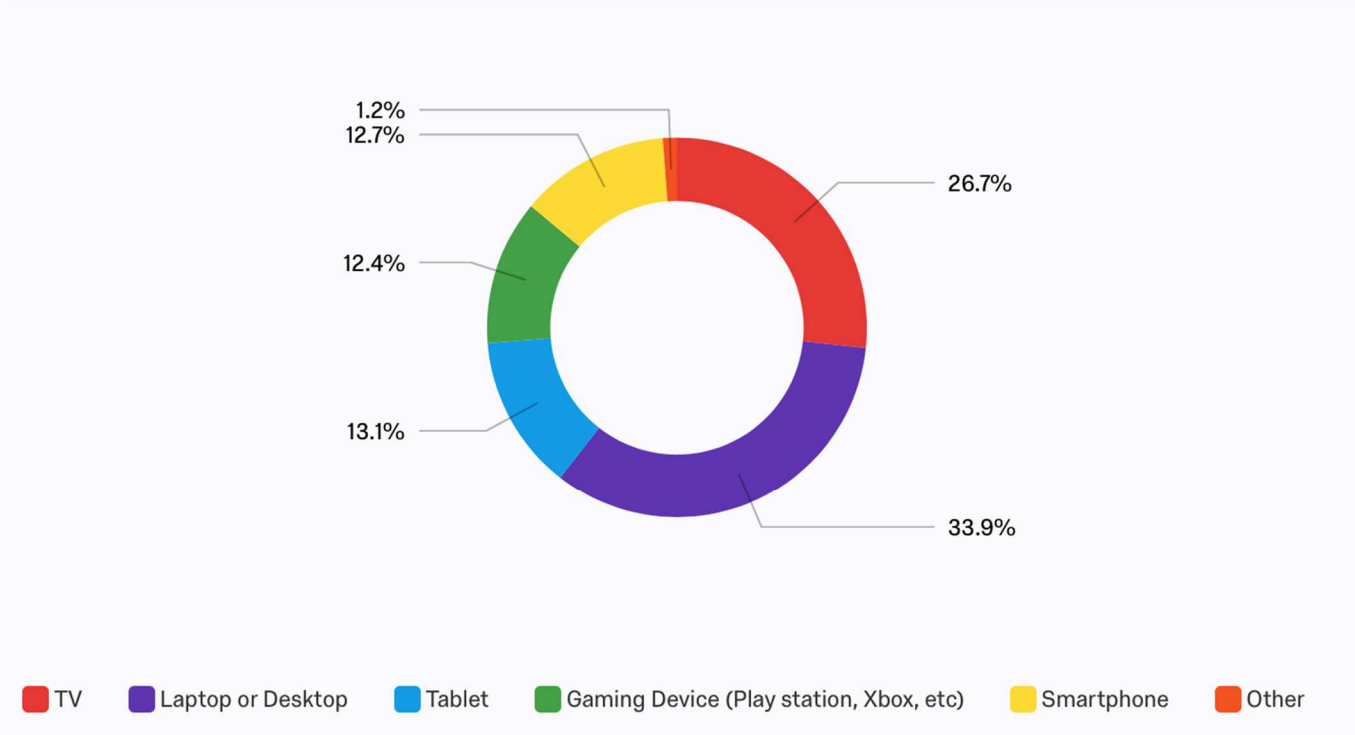

Figure 6 Participants' Netflix access by device

Participants were given the option to choose more than one type of device to reflect what devices were being used when accessing Netflix. Per the data, TV and Laptop/Desktop were the two most commonly used devices for Netflix streaming, with 26.7% and 33.9%, respectively. The numbers of participants streaming on tablets, gaming devices and smartphones were relatively close.

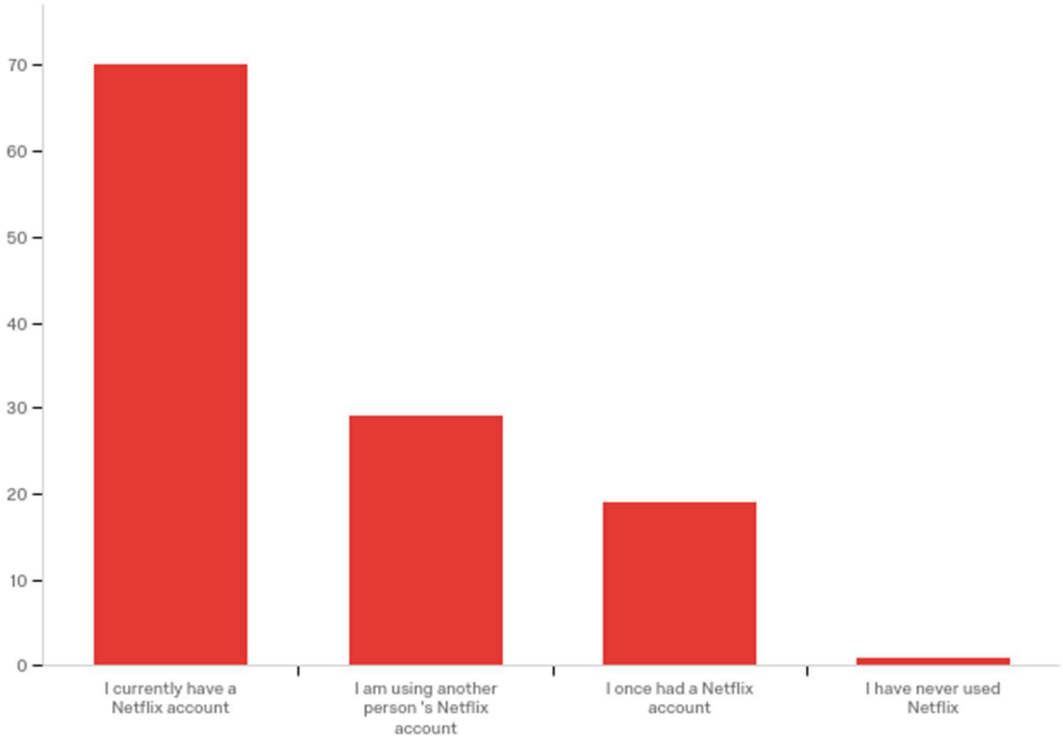

Figure 7 Participants' Netflix access by devices they use

The majority of participants paid for Netflix subscription themselves, followed by 24.4% sharing a subscription with someone else who was the main account holder. Participants were given the option to make multiple choices to reflect if they changed the way they access Netflix. 15.9% of the participants once had Netflix account.

4.2.2 Research question 2: How often do streaming users access Netflix?

Total participants' frequency of Netflix streaming use

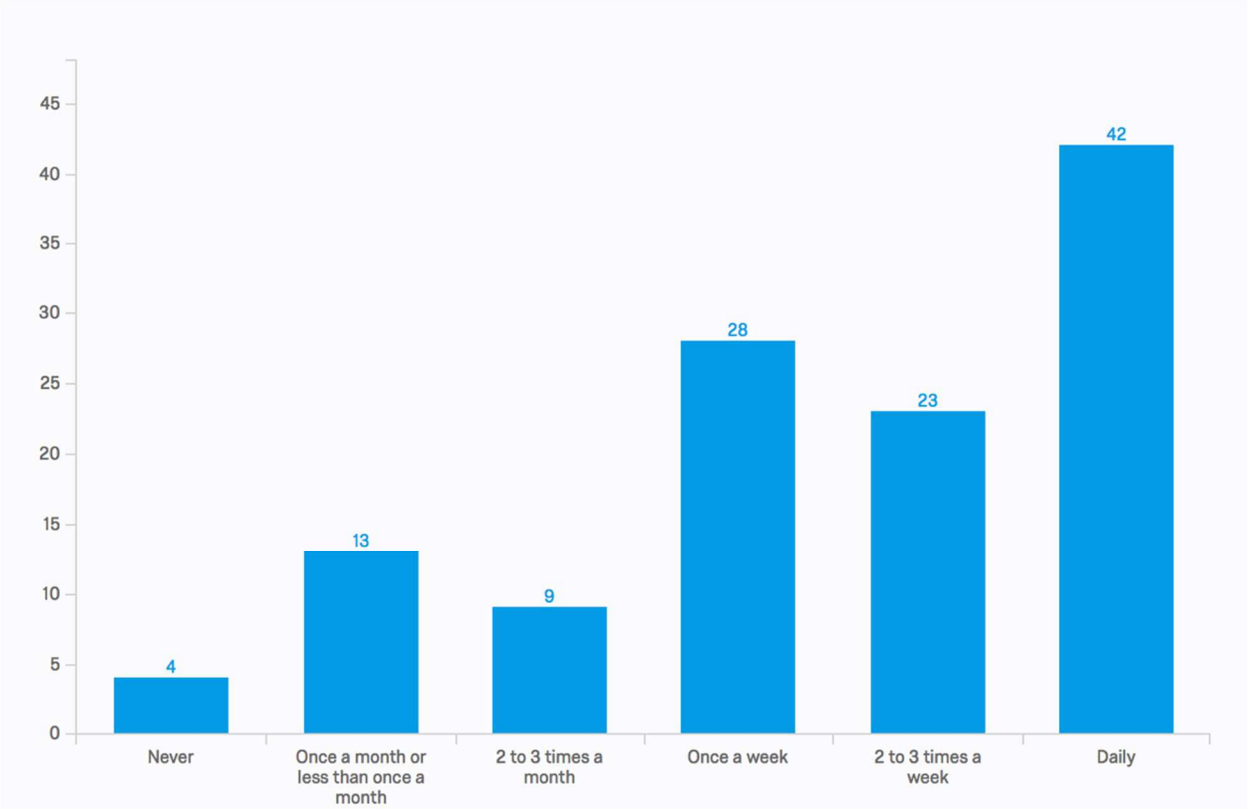

Figure 8 Participants' frequency of Netflix usage

93 out of 119 (78.2%) of participants were frequent Netflix users, accessing Netflix streaming at least once a week. The largest subset of the survey participants was daily streaming users at 29.4%, while the smallest subset was those of participants who never used Netflix at 2.8%. 19.6% of the participants access Netflix once a week, followed closely by streamers who use Netflix 2 to 3 times a week (16.1%). 13 out of 119 of the participants only use Netflix streaming once or less than once a month.

Breaking down the frequency by gender, 78.3% of male participants used Netflix streaming at least once a week, compared to 75.5% for the female participants. Considering different age groups, 18 to 34 year olds were the most active Netflix streaming users. 33% of participants age 25 to 34 access Netflix at least once a week, closely followed by age 18 to 24, at

26%. The average age for the daily users was 27.6 years old, the average age for 2 to 3 times a week streamers was 26, and once a week Netflix users averaged 28.4 years old.

Participants with a higher level of education show higher frequency Netflix streaming. Among 47 participants who completed a bachelor's degree, 35 used Netflix streaming at least once a week; 38 out of 48 (79.2%) participants who received an advanced degree used Netflix streaming at least once a week. Using cross tabulation to test the relationship between how often participants use Netflix streaming and education, at a 95% confidence interval, Chi-square equals 27.1, p-value=0.03 (<0.05). This statistic shows that there is a significant relationship between frequency of using Netflix streaming and level of education participants have completed. The higher educated the participants are, the more frequently they were using Netflix streaming.

Relationship between frequency and subscription

Among all the participants, 58.8% paid for their own Netflix access, while 24.4% of participants reported that they were sharing or using someone else's account. 19 out of the 119 participants once had an account but unsubscribed from the streaming service.

Table 2 Participants' frequency of Netflix usage

	How often do you use Netflix streaming?						
	Never	Once a month or less than once a month	2 to 3 times a month	Once a week	2 to 3 times a week	Daily	Total
I currently have a Netflix account	2	2	2	15	13	36	70
I once had a Netflix account	1	5	4	3	4	2	19
I am using another person 's Netflix account	0	6	3	10	6	4	29
I have never used Netflix	1	0	0	0	0	0	1
Total	4	13	9	28	23	42	119

36 out of 42 daily streamers, (85.7%), said they pay for their own subscription, followed by 56.5% and 53.6% for users who stream 2-3 times a week and once a week, respectively. 46.2%

of those who stream once a month or less than once a month shows that someone else paid for their Netflix access. Over 50% of those who use Netflix streaming on a monthly basis or never use Netflix streaming had cancelled their subscription. In general, frequent Netflix streamers were more likely to pay for their own Netflix access, while less active streaming users tended to share an account with others or even cancel their subscription.

4.2.3 Research question 3: What features and activities do Netflix users value the most?

Why participants began using Netflix

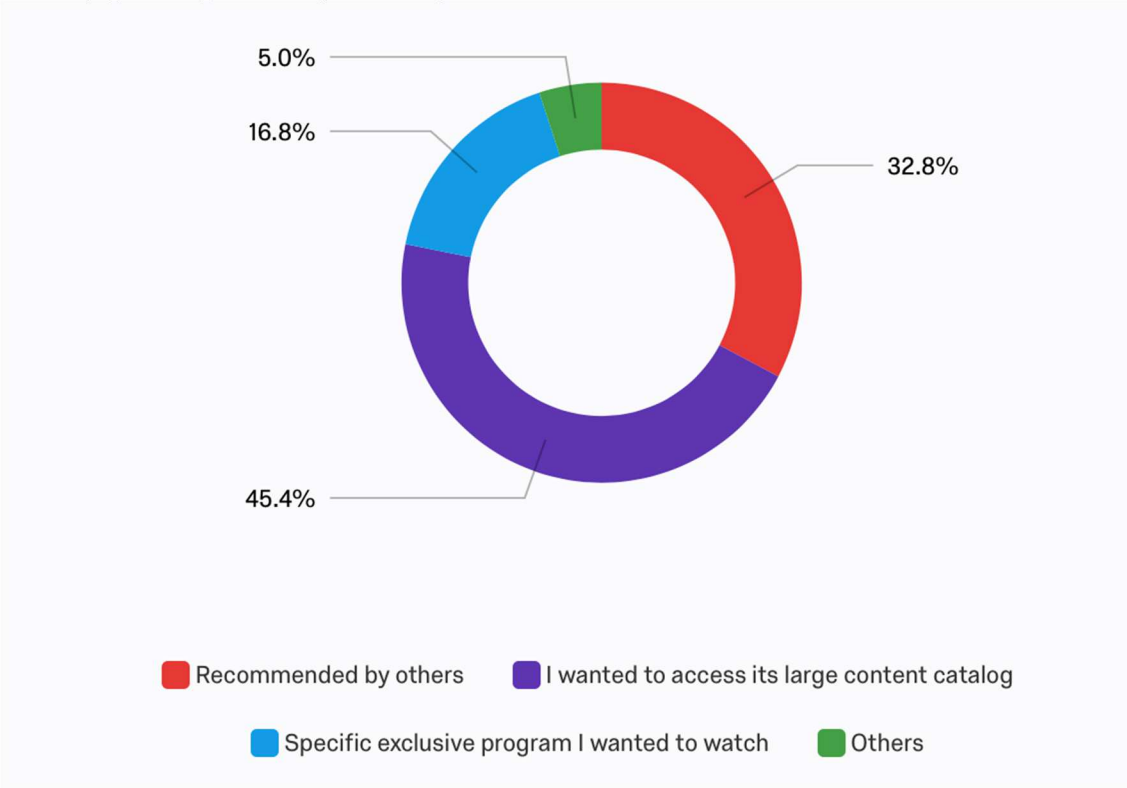

Figure 9 Reason why participants joined Netflix

Among all participants, 45.4% of users started using Netflix for its large content catalog. Only 16.8% of participants began using Netflix due to the original programs that are only available on Netflix. 32.8% of participants were introduced to Netflix by word-of-mouth.

Why participants began using Netflix streaming by gender

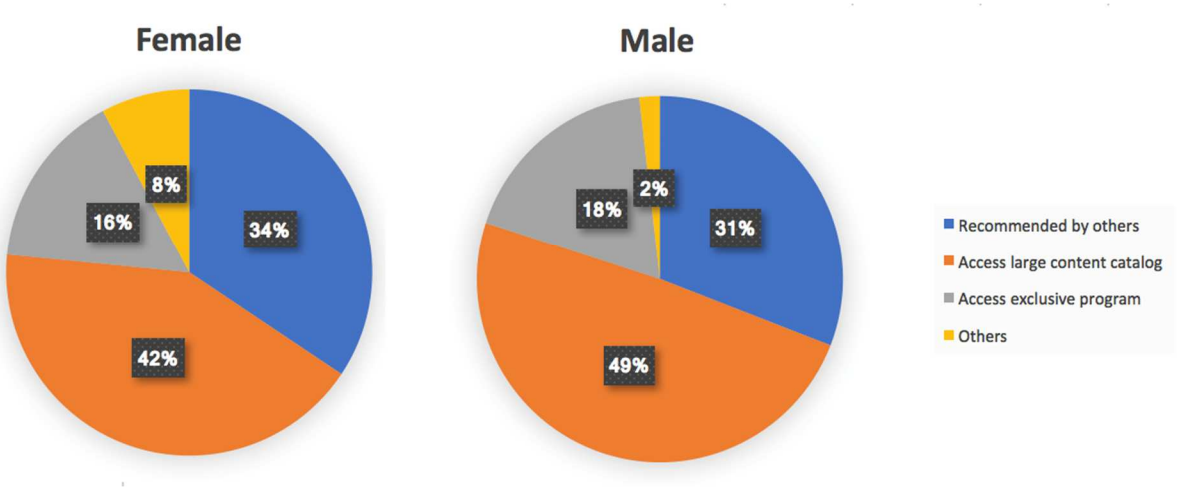

Figure 10 Reason why participants joined Netflix

Although male participants showed a slightly higher percentage (49.1% vs 41.8%), accessing Netflix's large content catalog was the most common reason for participants to join Netflix streaming service. The second most popular reason for joining was recommended by others where female participants showed a slightly higher percentage than male participants (30.9% vs 33.6%).

Why participants began using Netflix streaming by frequency of use

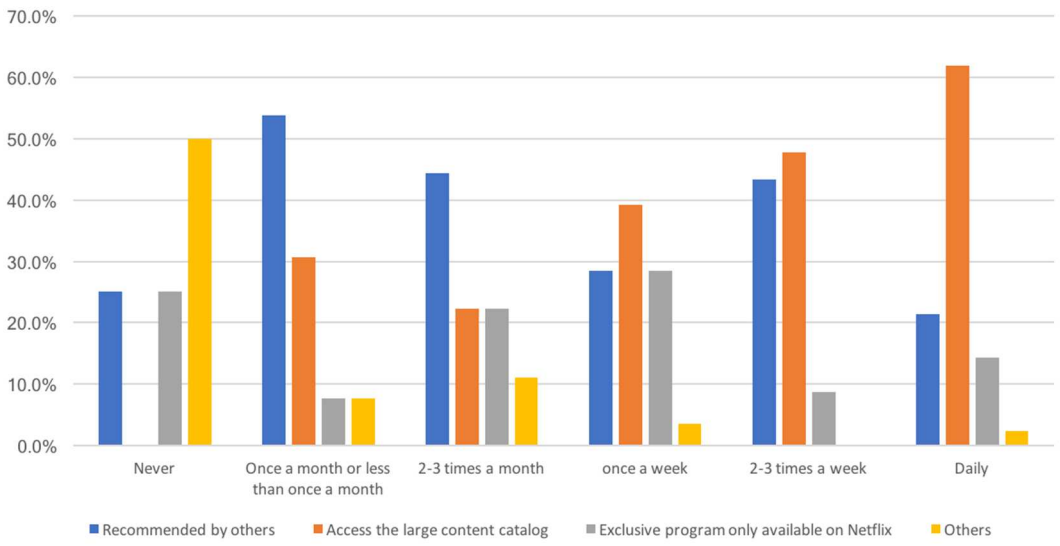

Figure 11 Reason why participants joined Netflix

The majority of participants in all categories of usage frequency chose "Recommended by others" and "Access large content catalog" as the two main reasons they joined Netflix. The "Daily" category had the highest percentage of participants selecting the "accessing large content catalog" at 62.2%. The "once a month or less than once a month" had the highest percentage of participants choosing "recommended by others" at 54.4% while the "Daily" category lowest at only 20.8%.

4.2.4 Research question 4: Do consumers always have a TV series/movie in mind before they go on Netflix?

Out of all the participants, 81 (68.1%) reported that they usually do not have specific content in mind before accessing Netflix.

Whether participants always know what to watch by why they joined Netflix

Table 3 The reason why participants joined Netflix

	Do you always have a show/movie in mind before accessing Netflix		
	Yes, always	No	Total
Recommended by others	14	24	38
I wanted to access its large content catalog	14	42	56
Specific exclusive program I wanted to watch	10	10	20
Others	0	5	5
Total	38	81	119

The cross-tabulation data show that, among participants who initially joined Netflix by others' recommendations, 63.2% (24) reported that they do not always know what they would watch before using Netflix streaming. For those who value Netflix's large content library, only 25.0% (14) of the participants knew the content they would be watching.

Whether participants know what to watch by whether they have viewed recommended content

Table 4 The reason why participants joined Netflix

		Do you always have a show in mind before acessing Netflix		
		Yes, always	No	Total
Have you ever watched a show that Netflix recommended to you based on what you previous watched?	Yes	25	74	99
	No	13	7	20
		38	81	119

Per the table above, over 90% of participants who usually have no specific content in mind had an experience viewing content recommended by Netflix. As for those who always know what to watch before accessing Netflix, only 65.8% had ever watched a show from their personalized recommendation list. Overall, a majority of the participants had viewed content based on what they had previously consumed.

4.2.5 Research question 5: How often do Netflix users go through Netflix's recommendation list before choosing new content to watch?

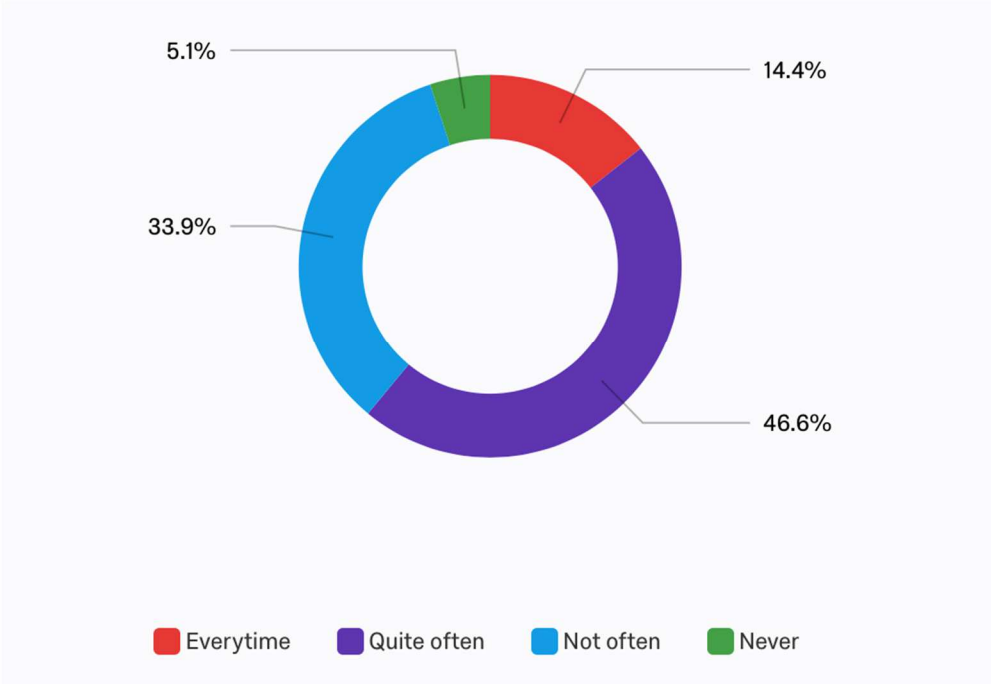

Figure 12 Frequency of using the recommendation list

This question intended to explore how often participants would usually browse through their personalized recommendation list. 14.4% of participants claimed that they checked the recommendation list every time they accessed Netflix, while 46.6% of participants answered that they browsed through their lists quite often. Only 5.1% reported that they had never checked their personalized list.

4.2.6 Research question 6: How do Netflix users choose new content to watch?

Participants were given the option to compare five different ways to choose new content to watch after finishing the current viewing content. In the survey, the question was presented as a ranking question which asked participants to compare the five different ways of selecting

content by placing them in order of preference. The five different ways of selecting content were: Netflix recommendation list, Word of mouth recommendation (which included recommended by friends or by social media), traditional media promotion (promo on television, radio and cinema trailers), online media promotion (such as advertisements on YouTube, Hulu, Xfinity, etc.) or film review aggregator (including IMDB, Rotten Tomatoes and Metacritic).

An average ranking is calculated for each choice in order to determine which answer was most preferred overall. Assuming the most preferred choice (which ranked as #1) weighted the smallest, while the least preferred choice (which they ranked as #5) weighted the highest, therefore, the answer choice with the smallest average ranking is the most preferred way for participants to select new viewing content.

Table 5 Ranking of the preferred methods of content discovery

	Rank										
	1		2		3		4		5		Mean
Netflix recommendations	19.30%	22	23.68%	27	24.54%	28	18.42%	21	14.04%	16	2.84
Word of mouth	50.88%	58	24.56%	28	12.28%	14	10.53%	12	1.75%	2	1.88
Traditional media promotion	11.40%	13	13.16%	15	23.68%	27	23.68%	27	28.07%	32	3.44
Online media promotion	6.14%	7	22.81%	26	22.81%	26	31.58%	36	16.67%	19	3.3
Film review aggregator	12.28%	14	15.79%	18	16.67%	19	15.79%	18	39.47%	45	3.54

Per the data shown above, 48.7% of participants chose Word of Mouth as their primary source for selecting new content to watch on Netflix. Meanwhile, only 1.8% of participants ranked ‘Word of mouth’ as the last way to choose their new content. Note that even those participants who ranked ‘Word of mouth’ as the second option were the second largest group after those rated ‘Word of mouth’ as their first choice. With an average of 2.84, ‘Netflix recommendation’ was the second most preferable way of selecting new content among participants. 67.5% of participants reported that Netflix’s recommendation list was one of their

Top 3 choices when it came to selecting subsequent viewing content. Participants did not rate 'film review aggregator' as a very important source for selecting new content. Although the 'film review aggregator' was ranked as the number1 choice more than 'traditional media promotion' and 'online media promotion', with a 3.54 average, nearly 40% of participants considered it as the last source.

4.2.7 Research question 7: Do consumers value the Netflix's recommendation system?

Regarding the Netflix recommendation system, respondents were asked to rate two given statements to the value of their Netflix access: "Recommendation system is somehow accurate in predicting my interests" and "I value this feature and want to continue to use it". On a scale where 0 is "Strongly disagree", 4 is "neutral", 7 is "strongly agree, respondents rated to what extend they agree with the statement.

Table 6 How participants value the Netflix's recommendation system

Statement	Minimum	Maximum	Mean	Median	Std Deviation	Variance	Total
Recommendation system is somehow accurate in predicting my interest.	0	7	4.39	5	1.29	1.66	119
I value this feature and want to continuously use it	0	7	4.8	5	1.29	1.66	119

For the first statement "Recommendation system is somehow accurate in predicting my interests", 119 participants gave a 4.39 mean rating which was slightly lower than the average of 4.80 for the second statement "I value this feature and want to continue use it". Also, recommendation's predicting accuracy had a relatively low standard deviation of 1.29 compared to 1.68.

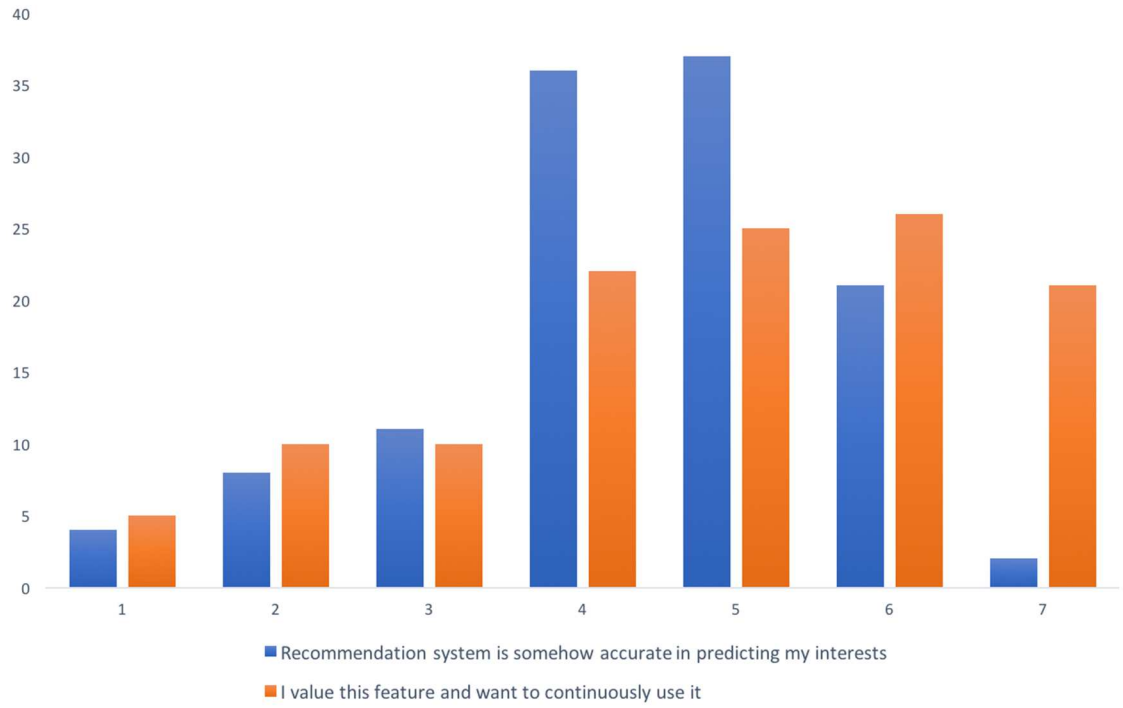

Figure 13 How participants value the Netflix's recommendation system

Above is the data distribution for the two statements. The participants' rating for "Recommendation system is somehow accurate in predicting my interests" had a left-skewed distribution where the left side of the tail was longer than the right side. The mass of the distribution of data was more concentrated in the middle to the right side of the figure. A similar trend has also shown for the data distribution for the second statement "I value this feature and want to continuously use it". The medians for both statements were larger than the means (5 vs 4.39, 5 vs 4.80).

4.2.8 Research question 8: Overall how satisfied are you with Netflix's recommendation system?

The respondents were asked to rate their overall satisfaction with the Netflix recommendation list, on a scale where 0 is “extremely dissatisfied”, 4 is “neutral”, 7 is “extremely satisfied”.

Table 7 Participants’ overall satisfaction towards Netflix’s recommendation system

Statement	Minimum	Maximum	Mean	Median	Std Deviation	Variance	Total
Overall satisfaction with Netflix recommendation system	0	7	4.34	4	1.24	1.54	119

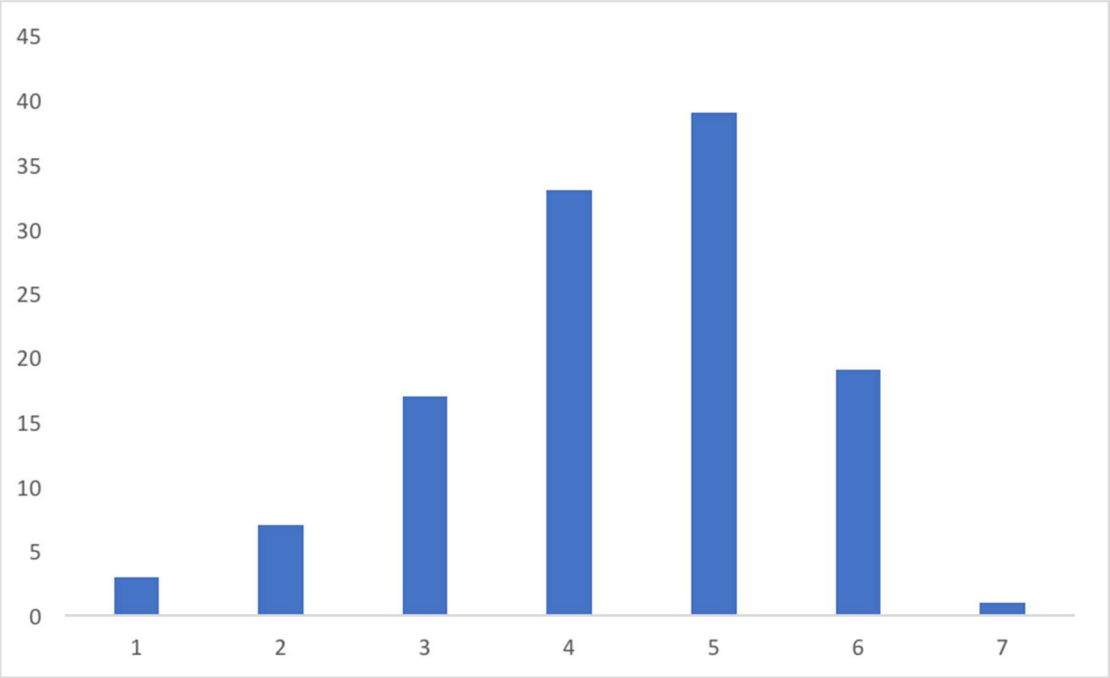

Figure 14 Participants’ overall satisfaction towards Netflix’s recommendation system

Out of all respondents, the average rating for overall satisfaction was 4.34 which is slightly higher than the median. From figure 9, the data distribution was concentrated toward the right side of the scale. Participants who gave the Netflix recommendation system a 5 rating “slightly satisfied” was the largest group with 39 participants, followed by 33 participants who indicated 4 “neutral”. 19 participants reported a moderate satisfaction when using the

recommendation system, while 17 claimed they were slightly dissatisfied. Only one participant was extremely satisfied with their experiences with the Netflix recommendation system.

In the survey, participants were also given the option to comment on their experience with the recommendation system. Participants commented that the recommendation list has helped them explore content that they had not previously heard of, and opened them to new genres that they never thought they would watch. Out of 24 collected comments, 6 participants raised concerns regarding Netflix original programming. According to the comments, some of the participants pointed out that, in their personalized recommendation list, Netflix originals always appeared before other content, and Netflix tends to promote their original content in the recommendation list. Other comments had mentioned that it would be easier for users to choose new content if Netflix could include Rotten Tomatoes, IMDB and other film review aggregators' ratings into its system.

CHAPTER 5 DISCUSSION

5.1 Introduction

Netflix algorithms track user interactions on the platform such as browsing or pausing, and they use collected metadata to optimize different aspects of the user experience. The recommendation list that is created by the algorithm leads to the question- how accurately it represents the users' taste and how satisfied are users with the experience. Therefore, this study sought to examine streaming users' satisfaction and perceptions toward the Netflix's recommendation system.

In Chapter 3 Methodology, the study proposed three hypotheses and eight research questions. There were two to three research questions which corresponded to each hypothesis. In order to examine the proposed hypotheses, an online Qualtrics survey was created and distributed to collect audience opinions on those research questions. The participants were contacted via the snowball method using sites such as Facebook, Twitter, LinkedIn, Reddit and Amazon Mechanical Turk. The online Qualtrics survey had a completion rate of 82.6% (119/144).

5.2 Review of the Hypotheses and research questions

Hypothesis 1: For users, Netflix's personalized recommendation system is one of the most valuable features.

RQ1: Who are Netflix's streaming users? And how do they access it?

With n=119, 55 male (46.2%) and 64 female (53.8%) participants completed the survey. The participants' ages were heavily skewed toward millennials, as 77.8% of the participants were between 18 and 35 years old. 39% of participants had college-bachelor or higher degrees and 41% of the participants had a college-advanced degree.

Participants' educational data show that a large portion of Netflix streaming users are well-educated college graduates.

Among those participants who chose to disclose their annual household income, nearly half of the participants (48%) had an annual income level below $50K, partly due to the reason that the majority of the participants were millennials. In terms of viewing devices, TV, and laptop/desktop were the most commonly used devices for streaming with over 60% of the usage combined. Tablets, smartphones and gaming devices (Xbox, play station, etc.) have similar shares at 12% to 13% each. 58.8% of participants paid for their own Netflix subscription. Account sharing was seen in 24.4% of participants; 16.8 percent of participants claimed that they had recently cancelled their Netflix account.

RQ2: How often do streaming users access Netflix

78% of participants were frequent streaming users that used Netflix at least once per week. Among those participants, daily streaming users were the largest subset at 29.4%, followed by at least once a week users at 19.6%. 16.1% of the participants used Netflix 2 to 3 times a week. Male participants had slightly higher frequency of use than female participants.

Participants between 18 and 34 were more active streamers than the older participants. 26.9% of all participants between 18 and 34 were daily streamers. Participants between 18-24, and 25-34 have the most weekly streamers, at 26% and 33%, respectively.

Breaking down the frequency of access by education level, participants with higher levels of education show higher frequency of use. 38.6% of participants who had college-bachelor's degree were daily Netflix streamers, followed closely by participants who had college-advanced degree at 37.6%. This statistic indicates that there was a significant relationship between streaming frequency and highest level of education completed. Frequent Netflix streamers were more likely to pay for their own Netflix access. 85% of daily streamers paid for their own subscription, compared with 57% for 2-3 times a week streamers and 53% for once a week streamers. Over half of the participants who claimed to use Netflix on a monthly basis or less tended to share an account with others or had cancelled their subscription.

Based on the survey results, it is important to point out that age and education level were key factors in determining streaming frequency. Also, willingness to pay for a Netflix subscription was affected by how often they would use the streaming service.

R3: Why do participants begin using Netflix?

When participants were asked about the reason they joined Netflix, having access to the large content catalog and recommendations by friends were the primary motivators to pay for the service. In all categories of usage frequency, the survey results showed that for frequent streamers who access Netflix at least once a week, a constantly expanding content library was selected as the number one reason for participants to make the purchase decision. Word-of-mouth advertising, on the other hand, was the most common reason for less frequent streaming users to start a Netflix subscription. Netflix's original programming was not found to be a significant motivation for participants to join Netflix.

Hypothesis 2: Before choosing new content to watch, consumers usually check the personalized recommendation list.

When Netflix streamers log onto Netflix, or finish viewing a TV series or movie, how often they utilize the personalized recommendation list to select their next viewing content can show the level of engagement users have with the recommendation system.

RQ4: Do consumers usually have content in mind before they go on Netflix?

RQ5: How often do Netflix users go through Netflix's recommendation list before they choose new content to watch?

The survey data show that over two thirds (n=81) of respondents usually do not have specific shows in mind when they access Netflix. 98 out of 119, (82.4%) of respondents claimed that they had watched a TV series or movie on their recommendation list. The majority of participants had experience browsing through their personalized recommendation list. Over 60% of the participants browsed their personalized list quite often or even every time they accessed Netflix.

RQ6: How do Netflix users choose new content to watch?

When asked to rank the most to least preferred way to select new content from the recommendation list, word of mouth recommendation (by friends or by social media), traditional media promotion (on television, radio and cinema trailers), online media promotion (such as ads on YouTube, Hulu, Xfinity, etc.), film review aggregators (such as IMDB, Rotten Tomatoes and Metacritic), participants showed particular interests in word of mouth recommendations. Over half of participants chose word of mouth as their primary source of content selection and more than 87% of participants ranked it among their top 3 sources for choosing new content. This strongly indicates that word of mouth recommendations from people they know and trust could

provide the streamers a more credible indication of content quality, and could largely influence their viewing behaviors. Additionally, data has shown that online word of mouth recommendations can have a viral influence on the audience. For example, the Netflix original programming sci-fi-horror series Stranger Things, released on July 15, 2016, had generated 2.1 million views from its release date until the end of July. Even two weeks after it premiered on Netflix, the show hit its tweets-per-minutes peak of 350 posts every second on twitter (Chaney, 2016). These data along with the survey results clearly point out that peer influence of word of mouth is the most powerful way to impact how streamers make viewing decisions.

Following word of mouth, Netflix recommendation was heavily weighted as the second most preferred way for a streamer to choose new content. With an average of 2.8, over 64% of participants ranked the Netflix recommendation as one of the top 3 ways for making the next viewing decision. Although only 6% of the participants ranked online media promotion as the preferred source of content selection, over 50% of them felt positive toward online ads as one of three main sources in terms of content selection. On the other hand, participants did not rate traditional advertising or a film review aggregator as preferred methods for finding new content. With an average score of 3.5, 40% of participants considered film review aggregators as their last source for choosing new content, while tradition television promotion had a slightly higher average at 3.4.

From the results above, a large number of streaming users do need some sources of information to engage themselves in new content. The research data have shown that referrals from friends or trusted people tend to be more authentic for the audience compared with sources like film review aggregators, online or traditional advertising when it comes to content selection.

However, due to the nature of personalization, Netflix's recommendation list does draw a fair among of attention from users.

Hypothesis 3: The recommendation system is a valuable feature to streaming users' overall Netflix experience.

Participants were asked to express their feelings and opinions on the given statements and determine to what extent the statements best reflected their experience with recommendations. .

RQ7: Do consumers value the Netflix's recommendation system?

When asked to rate to what extend they thought the Netflix's recommendation system could accurately predict their taste, participants rated 4.3 with a 1.29 standard deviation. As for rating the second statement, "I value this feature and want to continue use it", the participants were asked to rate to what extent they valued this feature and were most likely to keep using the list. 119 participants gave a 4.8 average rating with a 1.68 standard deviation. On a 1 to 7 scale from 'strongly disagree' to 'strongly agree', participants showed mild agreement regarding the recommendation system's prediction accuracy. Compared with the first statement, on a scale of 1 to 7, a 4.8 average rating indicates that participants have slightly more confidence on the value the recommendation list has provided.

Although the participants did not show a clear positivity on accurately predicting their taste and continued usage of the recommendation list, the data implied positive perceptions. For both statements, the data have a similar trend of left-skewed (negative skewed) distribution which means the data were more concentrated on the right side of the scale. People tend to select

a neutral response when it comes to Likert scale questions (Edwards, M. L., & Smith, B. C. 2017); however, the negative skew of the data distribution indicates that, participants' recognition of recommendation list's predicting accuracy and value were leaning toward positive.

RQ8: Overall how satisfied are you with Netflix's recommendation system

In analyzing overall satisfaction in using the Netflix recommendation system, survey participants were also asked to rate on a 1 to 7 Likert scale, a question where 0 was 'extremely dissatisfied', 4 was 'neutral', and 7 was 'extremely satisfied'. An average 4.3 rating was given with a 1.24 standard deviation. 39 participants said that overall, they were 'slightly satisfied' about their experience with the recommendation list, followed closely with 33 who gave a 'Neutral' opinion on the overall satisfaction with the recommendation list. Only one participant claimed that he/she was extremely satisfied with the recommendation system, while 3 participants were extremely dissatisfied. Since the above mentioned 4 participants gave extreme answers to the question, it is important to examine how the data was spread and how well the 4.34 average rating represented the participants' overall opinions towards the recommendation system. The result shows that the first quartile (Q1) was equal to the median which was 4, while the third quartile was 5, meaning that less than 25% of participants rated their overall satisfaction either below 4 or above 5. Overall, participants' satisfaction toward the recommendation system fell between neutral to slightly satisfied.

Moreover, participants shared both positive and negative opinions regarding the Netflix recommendation system. On the positive side, a few participants commented that the recommendation system was a great way to explore new content which they were previously unaware of, and the 'popular on Netflix' list exposed them to new genres they were previously

not interested in. Participants also stated that the system reacted quickly to their viewing history. Once a streamer finished watching content from a micro-genre, the system would quickly recommend more content from that very specific niche. On the negative side, participants raised concerns regarding Netflix's original programming. It seems that Netflix tends to promote their original content on the recommendation list to raise awareness among streamers. Also, a few comments pointed out the fact that the system would require a certain amount of viewing history to generate lists that could potentially fit a streamers taste. In such a case, for streamers who were new to the service, it would still require considerable browsing through lists before finding something interesting to watch. Although based on the results from research question 6, film review aggregators were not a primary source for choosing new content, the streamers seem to value an integration of film aggregators' rating systems into Netflix's recommendation list.

5.3 Conclusion

The research study had a similar number of male and female participants. With 77.8% of the participants' ages between 18 and 35 years, the participants were heavily skewed toward well-educated millennials. The majority of participants preferred using TV and laptops/desktops for streaming. Close to 60% of the participants had their own Netflix subscription, while close to one fourth of the participants shared a Netflix account. The remaining participants reported that they no longer used Netflix. In terms of frequency of use, 78% of participants were frequent streaming users that used Netflix at least once a week. Younger participants showed higher frequency than the older participants. Also, participants who achieved higher education accessed Netflix more often. Frequent streamers had a greater likelihood to pay for their own subscription. In addition, a large content catalog and word-of-mouth advertising were the main reasons for streaming users to make a subscription decision.

Not only did word-of-mouth have a major influence on joining the service, it was also the most preferred way to discover content. The rapidly growing influence of social media plays a vital role in how streaming users select new content. When asked to rank the most preferred way to make viewing decisions, word-of-mouth recommendations from people they know and trust was rated the best way to choose new content. Even Netflix's Corporate Communications VP Steve Swasey admitted that "unpaid marketing is priceless, and the best marketing for Netflix is word of mouth" (Massoud, 2011). Since Netflix has allocated a large budget for creating original content, understanding how word-of-mouth, specifically online word-of-mouth influences streamers' content selecting decisions is crucial for Netflix to market their products. On the other hand, the recommendation system was not found to be the most preferred source for participants in new content discovery. The recommendation list was ranked the second most common way for streamers to make the next viewing decision. Although the majority of participants reported that they had watched content from their personalized recommendation list and over 60% of the participants browsed through the list on a regular basis, Netflix released data showing that 75% of what streamer watch is from the recommendations (Amatriain, X., & Basilico, J. 2012). Word-of-mouth recommendation seems more reliable and authentic than the algorithm.

In terms of overall streamer satisfaction toward the recommendation system, the study couldn't draw a clear conclusion on whether this feature helped to maximize the user experience. Although, based on the data distribution, participants showed a mild positive perception to the predictive accuracy of the list, and a slight positive tendency toward future use, however, in terms of overall satisfaction, participants expressed a fairly neutral opinion towards the personalized recommendation list. Clearly, the recommendation list is a valuable feature to have, but it did not help to maximize the overall user experiences.

With rising competition among streaming services, personalization is the key for Netflix to differentiate themselves from competitors. To cope with this emergence of competition, Netflix needs to further improve their personalization engine and the recommendation system.

5.4 Recommendations for future study

Based on the results of this study, there are several recommendations for future research. Due to the limitation of small sample size, it would be beneficial for future studies to distribute the survey to a bigger sample size and more complex demographics in terms of ethnicity. Getting a global view on how international streamers think about the recommendation system is also crucial since Netflix is going through a rapid global expansion. Moreover, some of the research questions can be asked directly in an interview method with follow-up questions to get more in-depth user opinions.

BIBLIOGRAPHY

1. Hindman, D. B., & Wiegand, K. (2008, March 1). The big three's prime-time decline: a technological and social context. Journal of Broadcasting & Electronic Media, 52(1), 119+. Retrieved from http://link.galegroup.com/apps/doc/A177361653/BIC1?u=drexel_main&xid=3160707f

2. Anita Elberse. (2015). MRC's House of Cards. HBS No. 9-515-003. Boston, MA: Harvard Business School Publishing.

3. Greenfiled, R. (2013, February 1). The Economics of Netflix's $100 Million New Show. Retrieved from The Wire website: http://www.thewire.com/technology/2013/02/economics-netflixs-100-million-new-show/61692/

4. Sweney, M. (2014, February 23). Netflix gathers detailed viewer data to guide its search for the next hit. Retrieved from The Guardian website: http://www.theguardian.com/media/2014/feb/23/netflix-viewer-data-house-of-cards

5. Popper, B. (2015, April 15). Netflix tops 60 million subscribers as international growth continues to surge. Retrieved from The Verge website: http://www.theverge.com/2015/4/15/8421495/netflix-q1-2015-earnings

6. Dreier, T. D. (2015, June 30). Netflix Is the #3 Broadcaster in the U.S., Will Be #1 in 2016. Retrieved from Streaming Media website: http://www.streamingmedia.com/Articles/News/Online-Video-News/Netflix-Is-the-3-Broadcaster-in-the-U.S.-Will-Be-1-in-2016-104964.aspx

7. Gray, D., & Dennis, M. D. (2010). Audience satisfaction with television drama: a conceptual model.

8. Leichtman Research Group. (2015, January 2). 76% of US households have a DVR, Netflix, or use On-Demand. Retrieved January 13, 2015, from http://www.leichtmanresearch.com/press/010215release.html

9. Patel, S. (2015, July 7). WTF is OTT. Retrieved from DIGIDAY website: https://digiday.com/media/what-is-over-the-top-ott/

10. Reedy, S. (2011, May 18). The 10 over-the-top video commandments. UDM Tech. Retrieved from http://www.lightreading.com/cable-video/ott/the-10-over-the-top-video-commandments/d/d-id/686857

11. Taga, K. & Schwaiger, C. (2012, November 5) Over-the-top video – "First to scale wins". Retrieved October 19, 2013, from http://www.adlittle.com/downloads/tx_adlreports/TIME_2012_OTT_Video_v1282.pdf

12. Digital TV Research. (n.d.). Over-the-top TV and video revenues in North America from 2010 to 2021 (in billion U.S. dollars). In Statista - The Statistics Portal. Retrieved from https://www.statista.com/statistics/482976/ott-tv-revenue-north-america/.

13. Digital TV Research. (n.d.). Number of paying SVoD Netflix subscribers in North America in 2015 and 2021 (in millions). In Statista - The Statistics Portal. Retrieved from https://www.statista.com/statistics/648552/netflix-subscribers-north-america/.

14. NCTA. (n.d.). Leading video subscription services in the United States in 1st quarter 2016, by number of subscribers (in millions). In Statista - The Statistics Portal. Retrieved from https://www.statista.com/statistics/185390/leading-cable-programming-networks-in-the-us-by-number-of-subscribers/.

15. Stenovec, T. (2014, May 14). Our national Netflix addiction just keeps getting worse. Retrieved from http://www.huffingtonpost.com/2014/05/14/netflix-bandwidth-data_n_5318601.html

16. PwC. (2015, n.d.). Share of over-the-top (OTT) services users among TV watchers in the United States from 2013 to 2015, by service. In Statista - The Statistics Portal. Retrieved from https://www.statista.com/statistics/498435/ott-subscribers-penetration-usa/

17. Victor. (2007, February 14). Victor in Internet | 2/14/2007 Netflix's Competitive Advantage. Retrieved from Noise Between Stations website: http://noisebetweenstations.com/personal/weblogs/?p=2011

18. Keating, G. (2012). Netflixed: The epic battle for America's eyeballs. Penguin.

19. Anderson, N. (2007, January 16). Netflix offers streaming movies to subscribers. Retrieved from: http://arstechnica.com/uncategorized/2007/01/8627/

20. Cook, C. I. (2014). Netflix: A stepping stone in the evolution of television.

21. Greene, A. (2013, December 5). How 'Lilyhammer' Changed the TV World. Retrieved from Rollingstone website: http://www.rollingstone.com/tv/news/how-lilyhammer-changed-the-tv-world-20131205#ixzz3007H0e11

22. Netflix. (n.d.). Number of Netflix streaming subscribers in the United States from 3rd quarter 2011 to 2nd quarter 2017 (in millions). In Statista - The Statistics Portal. Retrieved from https://www.statista.com/statistics/250937/quarterly-number-of-netflix-streaming-subscribers-in-the-us/.

23. MELANSON, M. (2011, January 26). Netflix Adds 7.7 Million Subscribers in 2010 to Pass 20 Million. Retrieved from ReadWrite website: https://readwrite.com/2011/01/26/netflix_adds_77_million_subscribers_in_2010_to_pas/

24. Bishop, B. (2013, February 1). Every episode of Netflix's original series 'House of Cards' is

available now. Retrieved from The Verge website: https://www.theverge.com/2013/2/1/3939814/netflix-original-series-house-of-cards-available-now-kevin-spacey

25. Markman, J. (2017, January 9). Netflix Knows What You Want ... Before You Do. Retrieved from Forbes website: https://www.forbes.com/sites/jonmarkman/2017/06/09/netflix-knows-what-you-want-before-you-do/#27b5cfc152b8

26. Liftigniter (2016, March 15). The Power Of Netflix's Personalized Video Recommendations. Retrieved from LiftIgniter website: https://www.liftigniter.com/netflix-personalized-video-recommendations/

27. MITTELL, J. (2016, February 3). Why Netflix Doesn't Release Its Ratings. Retrieved from The Atlantics website: https://www.theatlantic.com/entertainment/archive/2016/02/netflix-ratings/462447/

28. Global online TV & video revenue forecasts. (2015, Aug 03). PR Newswire Retrieved from https://www.library.drexel.edu/cgi-bin/r.cgi/login?url=https://search.proquest.com/docview/1700788928?accountid=10559

29. Thomas, D. (2015, August 25). How video-on-demand tech is changing the TV landscape. Retrieved from BBC business website: http://www.bbc.com/news/business-34050865

30. Granados, N. (2016, Apricl 19). Battle Of The Giants: Amazon Joins Hulu In The War Against Netflix. Retrieved from Forbes website: https://www.forbes.com/sites/nelsongranados/2016/04/19/battle-of-the-giants-amazon-joins-hulu-in-the-war-against-netflix/#588ed39224d6

31. Wilhelm, P. (2017, April 10). Yes, Netflix still leads streaming, but these services are closing in. Retrieved from Techradar website: http://www.techradar.com/news/netflix-leads-the-pack-in-streaming-but-other-services-are-catching-up

32. Barna, D. (2014, January 3). Netflix Has 76,897 Ways To Label Your Taste. Retrieved from Refinary29 website: http://www.refinery29.com/2014/01/60036/netflix-has-76897-subgenres

33. Madrigal, A. (2014, January 2). Netflix Built Its Microgenres By Staring Into The American Soul. Retrieved from NPR website: http://www.npr.org/sections/alltechconsidered/2014/01/02/259128268/netflix-built-its-microgenres-by-staring-into-the-american-soul

34. Madrigal, A. C. (2014, January 2). How Netflix Reverse Engineered Hollywood. Retrieved from The Atlantic website: http://www.theatlantic.com/technology/archive/2014/01/how-netflix-reverse-engineered-hollywood/282679/?_r=true

35. Chaney, J. (2016, August 5). Stranger Things, Ghostbusters, and the Value of Less Advance Hype. Retrieved from http://www.vulture.com/2016/08/stranger-things-ghostbusters-and-the-value-of-less-hype.html

36. Edwards, M. L., & Smith, B. C. (2017). THE EFFECTS OF THE NEUTRAL RESPONSE OPTION ON THE EXTREMENESS OF PARTICIPANT RESPONSES. Retrieved from Incite: Journal of Undergraduate Scholarship website: http://blogs.longwood.edu/incite/2014/05/07/the-effects-of-the-neutral-response-option-on-the-extremeness-of-participant-responses/

37. Massoud, J. (2011, November 23). Netflix VP: word of mouth is the best marketing tool. Retrieved from Myce website: http://www.myce.com/news/netflix-vp-word-of-mouth-is-the-best-marketing-tool-54915/

38. Amatriain, X., & Basilico, J. (2012, April 6). Netflix Recommendations: Beyond the 5 stars. Retrieved from Netflix Technology Blog: https://medium.com/netflix-techblog/netflix-recommendations-beyond-the-5-stars-part-1-55838468f429

39. Hulkower, B. (2012) Online and streaming video – US – November 2012. Retrieved from Mintel database.

40. Hulkower, B. (2013) Streaming Media: Movie and Television – US – November 2013. Retrieved from Mintel database.

41. Hulkower, B. (2016) Streaming Media: Movie and Television – US – November 2013. Retrieved from Mintel database.

42. Netflix's New Users Insights to Help Analyze Their Market Share Growth. (2015, May). Retrieved from CivicScience website: https://civicscience.com/wp-content/uploads/2015/05/CivicScience-Netflixs-New-Users-May-2015-Final.pdf

43. Sappington, B. (2016, April 14). Parks Associates Announces Update to OTT Subscriber Churn Rates for Netflix, Hulu, and Amazon Users [Press release]. Retrieved from https://www.parksassociates.com/blog/article/pr-0414016

44. Baumgartner, J. (2016, April 4). Netflix Has Lowest Churn Rate Among OTT Services: Study. Retrieved from NewBay Media website: http://www.multichannel.com/news/content/ netflix-has-lowest-churn-rate-among-ott-services-study/404142

45. McAlone, N. (2016, September 26). Netflix's competitors are quickly closing the gap in a crucial area. Retrieved from Business Insider website: http://www.businessinsider.com/netflix-competitors-amazon-and-hulu-catch-up-in-customer-satisfaction-2016-9

46. Owens, J. (2016, July 19). Netflix price increase does damage, but media and subscribers blamed. Retrieved from Market Watch website: http://www.marketwatch.com/story/netflix-price-increases-causing-subscribers-to-sign-off-2016-07-18

47. E-Poll Market Research. (2016, May 18). Netflix is Now Preferred TV Viewing Source for ALL Demographic Groups. Retrieved from CISION website: http://www.prnewswire.com/news-releases/netflix-is-now-preferred-tv-viewing-source-for-all-demographic-groups-300270704.html

48. Effler, G. (2016, August 25). Netflix Ranks Highest among Paid TV Streaming Video Services [Press release]. Retrieved from http://www.jdpower.com/press-releases/ jd-power-2016-streaming-video-satisfaction-study

APPENDIX A: Survey-Netflix's Recommendation System

You are invited to participate in this survey which has been created to collect data for a Master's thesis research study. Your participation in this study is completely voluntary. It is very important for us to learn your opinions. Please select options that are most suitable to your streaming TV consumption habits. Completion of this survey will take approximately 3 minutes. Thank you very much for your time and support. Please start with the survey now by clicking on the Continue button below.

Q1 Choose one answer that applies

- ❍ I currently have a Netflix account (1)
- ❍ I recently cancelled Netflix's account (2)
- ❍ I am using another person 's Netflix account (3)
- ❍ I have never used Netflix (4)

Q2 What devices do you use for Netflix

- ❑ TV (1)
- ❑ Laptop or Desktop (2)
- ❑ Tablet (3)
- ❑ Gaming Device (Play station, Xbox, etc) (4)
- ❑ Smartphone (5)
- ❑ Other (6) _____

Q3 Why did you begin using Netflix

- ❍ Recommended by others (1)
- ❍ I wanted to access its large content catalog (2)
- ❍ Specific exclusive program I wanted to watch (3)
- ❍ Others (4) _____

Q4 How often do you use Netflix streaming?

- ❍ Never (1)
- ❍ Once a month or less than once a month (2)
- ❍ 2 to 3 times a month (3)
- ❍ Once a week (4)
- ❍ 2 to 3 times a week (5)
- ❍ Daily (6)

Q5 What genres are you interested in (select all that apply)?
- ❑ Action (1)
- ❑ Comedy (2)
- ❑ Classics (3)
- ❑ Documentary (4)
- ❑ Drama (5)
- ❑ Horror and Thrillers (6)
- ❑ International movies (7)
- ❑ Musicals (8)
- ❑ Romantic (9)
- ❑ Sci-fi (10)

Q6 Do you always have a show/movie in mind before accessing Netflix
- ❍ Yes, always (1)
- ❍ No (2)

Q7 Please rank from 1-5, how you usually choose a new show to watch after finishing current viewing content. ('1' being the main way for you to pick a new show, and 5 being the least way)

_____ Based on Netflix's recommendations (1)
_____ Word of mouth (include social media) (2)
_____ Traditional media promotion (TV/Radio/Cinema trailers) (3)
_____ Online media promotion (Youtube/Streaming service) (4)
_____ Film review aggregator (IMDB, Rotten Tomatoes, Metacritic, etc) (5)

Q8 Have you ever watched a show that Netflix recommended to you based on what you previous watched?
- ❍ Yes (1)
- ❍ No (2)

Q9 How often do you go through Netflix's recommended show list before you choose a show to watch
- ❍ Everytime (1)
- ❍ Quite often (2)
- ❍ Not often (3)
- ❍ Never (4)

Q10 Please rate the Netflix recommendation system to the value of your Netflix access.

_____ Recommendation system is somehow accurate in predicting my interests.I (1)
_____ I value this feature and want to continuously use it. (2)

Q11 In general, how appropriate would you say Netflix's recommendations have been to your taste

_____ 1 (1)

Q12 What is your gender

- ❍ Male (1)
- ❍ Female (2)

Q13 What is your age?

- ❍ 12-17 (1)
- ❍ 18-24 (2)
- ❍ 25-34 (3)
- ❍ 35-49 (4)
- ❍ 50-up (5)

Q14 What is the highest level of education you have completed?

- ❍ Middle or High school (1)
- ❍ College-bachelor degree (2)
- ❍ College-advanced Degree (3)
- ❍ Some college (4)

Q15 Please indicates your current annual household income in US Dollars

- ❍ Under $24,999 (1)
- ❍ $25,000--$49,999 (2)
- ❍ $50,000--$74,999 (3)
- ❍ $75,000--$99,999 (4)
- ❍ Over $100,000 (5)
- ❍ Rather not say (6)

Q16 Do you have any other thoughts regarding Netflix recommendation list ?