Adapting to the Mobile Internet and Cutting Cable:

Is the Mobile Internet Replacing Home Broadband

And Is the Internet Replacing Cable Television?

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Abstract

The introduction of the mobile internet allowed for access of the internet to become almost limitless. Initially the mobile internet was only used if the fixed internet was not present but this has changed over the past few years and people have become accustomed to the mobile internet. The growth of the mobile internet has made people wonder who is using the mobile internet and for what reasons. Throughout this study we will examine what age groups, and income levels are using the mobile internet. The growth of the mobile internet has also allowed for potential signs of displacement of broadband internet, which is examined. Finally, with the popularity of cutting cable, this study will examine the potential for displacement of cable television by the internet. We did find evidence to support that mobile internet usage is still statistically significant by age, with Millennials being most likely to use the mobile internet. We did not find support for the second hypothesis that the digital divide is narrowing. Evidence was found to support the hypothesis that mobile internet does show statistically significant evidence of displacement of broadband internet. The internet has been replacing most functionality of cable television and there is evidence in support of the final hypothesis that the internet is displacing cable television.

Introduction

Technology advancements of the past ten years have made a huge impact on the way individuals live their daily lives. Smartphones, tablets, smart TVs, and other mobile devices have allowed for people to access the internet almost anywhere and at any time through what is known as the mobile internet. The mobile internet is advancing and has made individuals wonder who is using the mobile internet and for what purposes. Throughout this study we will examine who is using the mobile internet in the United States and how these individuals differ. It can be noted, "gender differences persist in at least some type of online communication" (Baron and Campbell 2011, 15). There have been gender and race differences in internet use before so, how different might females and males be in their use of the mobile internet? Another important issue related to the mobile internet is how it may be related to other forms of media. Does spending time on the mobile internet cause people to spend less time on other media sources, or does the mobile internet reinforce the use of other media? I expect to find that more and more people of all ages and social classes are now using the mobile internet. I expect that the differences of use by gender will be lesser than previously thought. With the advancements of the internet there have been many television networks offering online content and companies like Netflix growing popularity. There have also been people who have been cutting cable television. Could the internet be displacing cable television?

Literature Review

Mobile internet has become very popular among younger generations. Many people have been concerned about how this new source of media will affect other sources of media like television and PC internet. In an article titled, "From the wired to wireless generation? Investigating teens Internet use through the mobile phone" by Wan-Ying Lin, Xinzhi Zhang,

Joo-young Jung, and Yong-Chan Kim, they explore this concern in Asia in 2012. In the article they explain what is known as "niche theory" which states that one type of media will either compete with or complement other types of media. In the theory "the niche of a medium is derived from its pattern of use, represents its strategy for survival and growth, and ultimately determines its position in a multidimensional space" (Ramirez et al. 2008, 530). Now with mobile internet becoming so popular how might it affect other outlets of media like PC internet and cable television? Recent studies show that laptops and home computers will be replaced throughout time with smartphones and tablets (Wan-Ying et al., 2013, 653). This would begin as "competitive displacement" meaning the mobile devices will start to replace home computers and laptops, but "competitive exclusion" would be when the mobile internet completely replaced the fixed internet (Ramirez et al. 2008, 532).

One important part of media research is gratification (Blumler & Katz, 1974; Rosengren, Wenner, & Palmgreen, 1985; Ramirez et al., 2008) this is because the more satisfied an individual is with the media they use, the more they may prefer that media. There are three main sections when examining the niche of different media types, two of which rely on user gratification. The first is niche breadth, if a form of media can allow a user to accomplish a wide range of media related activities it will have a higher breadth. It "can be interpreted as relative specialism or relative generalism" (Ramirez et al., 2008, 531). The more an individual can accomplish via one media the more gratified they will feel with that media. The second is niche overlap, the similarity between two media (Ramirez et al., 2008, 531). The more two types of media have in common or the more two types of media are used to accomplish the same tasks the more overlap between them. The last section of niche is competitive superiority, this measures the overall gratification each media provides the users and compares them (Ramirez et al., 2008,

532). When examining whether or not one media is displacing or reinforcing another it is important to account for all three sections. This allows for researchers to see how generalized each form of media is, how interrelated the forms of media are, and finally to see how satisfying each form of media is. When combining the three sections of niche theory researchers gain a framework that is used to test hypotheses in relation to new media displacing/complementing older media (Dimmick, 2002; Ramirez et al., 2008, 530).

In the study Wan-Ying Lin et al. found that mobile phones are very popular for teenagers in Asia. The study took place in five cities and all showed high popularity of mobile internet use, "Tokyo (87.8%), followed by Hong Kong (66%), Taipei (67.5%), Seoul (51.7%), and Singapore (48%)" (Wan-Ying et al. 2013, 655). They found that among younger generations the mobile internet is very popular but PC internet was still very popular as well. The teenagers seem to use the two internets in different ways. Mobile internet is used more recreationally while PC internet is used for research and finding information. The "mobile internet serves primarily as an extension of teens' internet activities via PC, rather than as a replacement" (Wan-Ying et al. 2013, 660). Having a new way of accessing the internet with mobile devices has not caused teenagers to lessen their PC internet use. According to niche theory the two types of internet complement one another: the more an individual uses one of these types of internet, the more they will use the other.

In the United States the use of mobile internet seems to be increasing due to the advancement of technology with smartphones, tablets, and smart TVs. According to a study in 2009 titled, "Mobile Phones Bridging the Digital Divide for Teens in the US?", by Katie Brown, Scott W. Campbell, and Rich Ling, "just 27% of American teens with mobile phones reported using their devices to access the internet" (Brown et al. 2011, 1). In 2009 using the internet on

mobile devices was fairly low. This could be because at the time mobile internet was "viewed as a slower, clumsier, smaller and generally lesser internet" (Brown et al. 2011, 6). There have been many advancements in mobile internet since this time. For instance, apps are now more widely available and the internet on phones has become more user friendly. Now the percentage of teens using the mobile internet is much higher. According to a study from the Pew Research Center, titled "Teen, Social Media and Technology Overview 2015", on teenagers' mobile internet use in the United States, 91% of teens now use the mobile internet (Lenhart 2015, 2). This shows that the way teens view the mobile internet has changed significantly from 2009 to the present.

The interesting fact is that in 2009 teens from lower income families were more likely to use mobile devices to access the internet (Brown et al. 2011, 1). This fact is interesting because in 2009 mobile internet was more expensive than open internet yet those with lower income were more likely to use mobile internet. In the United States there is a "Digital Divide", which is the fact that many people with lower incomes are unable to afford Internet or the devices used to access the internet, and internet access is key for communication. (Brown et al. 2011, 1). In other words higher income families have internet access while lower income families do not. It is believed that the mobile internet might be able to lessen this gap.

Technology has made it very easy to connect to others socially, which has become very important and lower income families may be unable to have access to the internet. In the study the term "social capital" is defined as our ability to have a social life, which allows us to more easily work together to accomplish tasks (Brown et al. 2011, 2). So in order to have high social capital an individual needs to have devices that can access the internet in order to easily socially connect with others. This has been a problem for those with lower income but mobile internet seems to be helping lower income families connect to the internet. Only 70% of families with

income lower than $30,000 per year had computers at home while 92% of families with higher than $30,000 per year had computers at home (Brown et al. 2011, 7). This is because buying devices such as laptops or PC's can be very expensive but buying phones that have internet access is not as costly allowing lower income families to have internet access. "In 2009, 40% of teens in the study who paid their entire phone bill used their phones to access the internet, compared to 23% of teens who paid part of their bill and 26% who paid none" (Brown et al. 2011, 8). This shows the importance of having access to the internet for younger generations; teens are willing to pay for their own phone bill so they can access the internet. Those with lower income are willing to spend money in order to have access to the internet and this shows how important the internet is to social capital in teenagers. This supports the idea that internet access is becoming more of a necessity as we advance in technology (Brown et al. 2011, 8). It is very important to have access to the internet in order to improve social capital. Now with so many cell phone companies in the Unites States competing, the mobile internet is becoming more and more affordable. The mobile internet becoming more affordable over time raises the question as to whether lower income families will ever purchase home internet or stick with the mobile internet.

It appears that mobile internet is used when other sources of internet access are unavailable. In a study on the Dutch population from 2012 titled, "Should mobile Internet be an extension to the fixed web? Fixed-mobile reinforcement as mediator between context of use and future use" by Mark de Reuver, Guido Ongena, and Harry Bouwman they examine the relationship between the mobile and fixed internet. Mobile devices had many advancements between 2009 and 2013, "the fixed and mobile internet are converging" as the mobile internet becomes more user friendly and resembles the fixed internet more and more (Reuver et al. 2013,

111). As mobile internet usage increases we are able to look at the mobile internet as an "adoption model" which tries to explain why and how people are adapting to the mobile internet (Reuver et al. 2013, 112). The reason most research done on mobile internet involves younger individuals is because teenagers are more willing to adapt to this new technology. According to the adoption model most teenagers are what is known as "personal innovators." These are the people who are innovative and willing to try new things like mobile internet (Reuver et al. 2013, 112). Personal innovators can give researchers information on how new technologies might be related to others. Research has shown, when examining sources of media, younger generations show signs of displacement (De Waal & Schoenbach, 2010; Westlund & Fardigh, 2011; Michael Chan, 2015). Innovators are starting to use their mobile phones for more than just texting and calling, they are now using applications that connect to the internet.

As of June 2016 there were 2.2 million apps for Android users (Google Play) and 2 million for Apple users ("App stores: number of apps", 2017). With such a wide array of apps available it seems the mobile internet has high breadth potential in comparison to the other forms of media. The amount of apps available on mobile devices allows for more users to find reasons to use the mobile internet. In a more recent study titled, "Examining the influences of news use patterns, motivations, and age cohort on mobile news use: The case of Hong Kong", by Michael Chan it was noted that individual's between the ages of 35 – 54 are in a "transition" period where a proportion of this age group are starting to adopt the mobile phone as their most used media platform (2015). It appears that as time goes on and the mobile internet advances and gains niche breadth more and more users are adapting to the mobile internet. When analyzing the use of the internet on mobile devices it appears that 90 percent of the time is spent using apps and only 10 percent is spent browsing the web (Dave Chaffey, 2017). These apps make it very easy

for users to pick up information or do activities that satisfy their needs and wants. With the mobile internet growing rapidly with more types of devices (smartphones, tablets, and Smart TVs) and with more and more apps and the price of the mobile internet becoming more affordable it is possible that not only will lower income families and younger people be sticking with the mobile internet but maybe higher income families and older individuals will also be steering away from traditional broadband internet use in favor of the mobile internet.

Some studies speaks against the displacement theory mentioned earlier in favor of the "use and gratifications theory" which "predicts that media is supplementary rather than competitive" (Reuver et al. 2013, 113). This is because mobile devices now have the capability to be an extension of many types of media. For example, a person can watch television, listen to the radio, make calls, and go on Facebook all from their mobile devices. Reuver et al. found "a strong reinforcement effect between mobile and fixed internet services" for the Dutch population (Reuver et al. 2013, 118). This means that the more people are using the fixed internet the more they are also using the mobile internet. Due to this strong reinforcement the use of mobile internet is growing and there are new applications for phones being created everyday. "The range of situations in which mobile services can be used is virtually limitless" (Reuver et al. 2013, 113).

The rapidly growing mobile internet is becoming more and more popular and seems to be doing so at an accelerating rate. The relationship between mobile internet and fixed internet is "quadratic and non-linear" (Wan-Ying et al. 2013, 660). A more recent study was published in 2016 titled, "Domestication of smartphones and mobile applications: A quantitative mixed-method study", by Mark de Reuver, Shahrokh Nikou, and Harry Bouwman takes a different approach. This more recent study records subject's actual mobile phone usage instead of relying

on more traditional methodologies such as self-report. This is a very interesting way of doing this type of research. In past research texting has been found to be the most used feature of mobile phones and this has not changed; they found that messaging still has the largest effect on individuals daily routines (Reuver et al. 2016, 359).

Even though the most used feature of mobile devices has not changed a number of things have changed. Now using mobile phones as a way to look up information has become a norm even when fixed internet is available (Reuver et al. 2016, 350). In past research there was evidence for the mobile internet being considered a "transit" niche meaning it was used "to exploit gaps in … daily routines when/where other more traditional channels … are unavailable, inappropriate or inconvenient" (Dimmick, Feaster, and Hoplamazian, 2011, 24). This has changed and people have grown accustomed to using their mobile device as a means to get information even when there are other options available. Also people's daily lives are more strongly affected by "downloaded applications than by native applications" (Reuver et al. 2016, 347). What this means is the newer applications that people can now download on mobile devices like social networking apps and games are becoming a big part of our daily lives. Reuver et al. found that the most frequently used applications on mobile devices are "instant messaging, social networking, gaming, and e-mail" this is important because in past research these applications were not easily available and widely used (Reuver et al. 2016, 356). The reasons for use of mobile devices is being redefined by the applications being created and only time can tell how these changes will develop. A possible reason social applications are the most important use of mobile devices could be because the "communication services make social interactions more visible and flexible, thus adding freedom to how people organize and control their (social) activities" (Reuver et al. 2016, 364). The mobile internet is rapidly changing and the people are

changing with it. There always needs to be more research being done on mobile internet to see why and how people use and interact with mobile devices.

Now even television networks have online apps and cites in which individuals can stream television online with mobile devices like tablets. Prior to tablets the mobile internet did not seem like much of a threat to cable television because smartphones have very small screens and watching television on smartphones was not as beneficial as the large TV screen. But even before tablets there was some evidence of the internet displacing TV. It was found that information seeking using online media was displacing TV (Kayana & Yelsma, 2000). The study also examined the displacement of entertainment using online media instead of TV but did not find any significance. The introduction of tablets, with their larger more visually pleasing screens, allowed for more individuals to prefer to watch television on their mobile devices for entertainment purposes. ESPN has a mobile app in which one can stream ESPN from mobile devices (Worden, 2011). There are also many news channels like CNN who also created mobile apps and offer live streaming on their websites (Reardon, 2011). Even channels like Disney Channel, Freeform, AMC, and History Channel now offer live streaming online. The introduction of tablets made the possibility of the mobile internet to displace television more plausible and likely. In a study published in 2014 titled, "Tablet computers and traditional television (TV) viewing: Is the iPad replacing TV?", the authors Clark F. Greer and Douglas A. Ferguson examine the relationship between television and iPads (tablets). The "results showed that, rather than displacing time with TV, the amount of TV viewing on an iPad was positively related to the amount of time watching traditional TV" (Greer & Ferguson, 2014).

One major flaw of the past study by Clark F. Greer and Douglas A. Ferguson was they were only accounting for individuals who own iPads and not other mobile devices, this fact

limited the sample size and the analysis. Also the data for this study was collected in 2011 and since then there have been many changes. The online streaming apps like Netflix, Amazon Video, and Hulu have gained a lot of attention since 2011. Now these streaming apps are developing their own original works and even being nominated for some of them. “For the 2017 Globes, TV honors are even, with both companies [Netflix and Amazon Video] securing five nominations each. (Matt Brian, 2016). These online streaming apps have become very popular and seem to produce high quality entertainment at a lower cost than cable. In Q3 of 2011 Netflix had 21.45 Million United States subscribers by Q4 of 2016 Netflix had raised to 49.43 Million United States subscribers (“Quarterly number of Netflix,” 2016). With the growing popularity of these companies that stream online one might believe they could potentially be causing some displacement of cable TV.

There are two types of displacement mentioned by Newell et al. (2008), the first is symmetrical and concentrates on the correlation, which is how the types of media increase or decrease usage in relation to one another. This is the type of displacement past research has examined and concentrated on when examining the hours individuals use each media and at what times of the day. The second type of displacement is known as functional displacement, this is when the new media can accomplish the same functions as the older and therefore can replace the media (Newell et al., 2008). With apps like Netflix and Amazon Video and now many more TV networks offering online streaming. We seem to be to a point where the internet can accomplish all the functions of cable TV. We have also recently been introduced to Smart TVs. A Smart TV can connect to the internet and allow individuals to go on youtube.com or any other cite to stream videos online. An individual can own a Smart TV and access television shows through the internet or on apps like Netflix without ever having cable. This has allowed individuals to cut

the cable cord and use the internet to access all cable TV functions. Examining how many people have been canceling cable subscriptions because they can access the cable TV functions through online sources is very important for media research, cable companies, and TV networks. If the internet really is displacing cable TV it is important for cable companies and TV networks to be aware early on in order to make changes and prepare for the future. It can be beneficial for TV networks to offer online streaming and have apps to keep up with the changing media and also start having advertisements/commercials online in order to have more revenue. This has been talked about in articles as early as 2001, "TV stations are rolling out apps for smart phones and tablets with the support of technology and software vendors, hoping that the apps will eventually provide a substantial, new source of advertising revenue" (Whitney, 2011). Now in 2017 we are seeing articles teaching "the most cost-effective methods for dropping cable in favor of streaming" (Waniata, 2017).

Theory

Most research done on mobile internet usage involves looking at teenagers or college student populations which is limiting when speaking of the entire population of the United States. Now that smartphones have been around for a number of years more adults are also using mobile devices often. According to the technology adoption model more and more individuals will eventually accept the new media (mobile internet). It starts with the innovators, which are usually teens but will spread to the rest of the population at some time. The population for this study is a representative sample of U. S. adults. This allows for us to examine differences in mobile internet usage by age. The first hypothesis states mobile internet usage is not statistically significant by age. To examine this we will break age down into generation categories and see how mobile internet usage relates to age. In the past research has shown that there is a digital

divide between the higher and lower income families. The second hypothesis states the "Digital Divide" is narrowing. In this study we will examine whether having or not having cable and having or not having home broadband is statistically significant by family income.

In past research people have found that the mobile internet would take away from other forms of media. Past research has also found that mobile internet reinforces other forms of media. "Literature shows ambiguous results concerning possible reinforcement or displacement effects between different media" (Reuver et al. 2012, 113). In this study we will examine if there is displacement of home internet and cable television by the mobile internet. The third hypothesis states the mobile internet is displacing home broadband. It is believed that as the amount of time people spend on the mobile internet increases so will the amount of time people spend on the fixed internet and I believe this is now changing. The mobile internet now can accomplish almost anything the fixed internet can. As individuals become more comfortable with using the mobile internet they may begin to feel they no longer need to also have home broadband. My final hypothesis states the internet is displacing cable television. With cutting out cable becoming a popular topic and the fact the internet can accomplish all functions of cable TV I believe cable television will start to be replaced by the internet.

Research Strategy

To test my hypotheses I have decided to use a dataset that came from Pew Research Center and is titled "June 10 – July 12, 2015 – Gaming, Jobs, and Broadband". This dataset was collected from June 10 – July 12, 2015, and the population consists of 2,001 individuals from the ages of 18 or older (Horrigan & Duggan 2015, 22). The population is representative of the United States. The data was collected by phone interviews, participants were contacted by landline (701) and cell phone (1,300). The dataset includes information on participants' use of

video games, home broadband, smartphones, and cable television. The decision was made to use this dataset because I believe this dataset can allow for me to more thoroughly examine the relationship between the different major media outlets of interest (mobile internet, home internet, and cable TV). This dataset was also chosen because it was the most current dataset I was able to find with the data being collected in June and July of 2015.

An article was published based on this dataset by John Horrigan and Maeve Duggan titled, "Home Broadband 2015 The share of Americans with broadband at home has plateaued, and more rely only on their smartphones for online access". This article brings forth a term "Smartphone-only" which means "those who own a smartphone that they can use to access the internet, but do not have traditional broadband service at home" (Horrigan & Duggan 2015, 2). This is important to note because this shows that the mobile internet may be taking away from the use of home broadband internet. This article also mentions a term "cord cutters" which is defined as those who have "abandoned paid cable or satellite television service" (Horrigan & Duggan 2015, 2). This is also important to note because it shows that the internet is potentially replacing paid cable services. The dataset has information on whether individuals have these different media and if not it has information on the reasons they do not. This information will help lead us towards answering the question of whether the mobile internet is reinforcing the use of home boradband or it is displacing it. This question is complicated and hard to answer, this dataset will be a baseline for the exploration of this hypothesis.

The dataset does have some limitations as well that must be mentioned. This dataset examines only the ownership of these media outlets and does not ask specifically how much time individuals use one or the other throughout the day. This is problematic when examining the relationship between these media outlets because most past research examine displacement by

looking at the number of hours people spend using each media and what parts of the day. This dataset also only has information of adults aged 18 or above, this could be problematic because teenagers are also a large and crucial part of the population in the United Sates when it comes to the use of technology. A more current dataset would be better specifically because of the new growing popularity of cutting cable and with the advancements of the mobile internet since 2015.

Variables

- **cable1 -** Whether participant subscribes to cable (1) or not (0).
- **home4nw -** Whether participant subscribes to home internet (1) or not (0).
- **intmob -** Does participant use mobile internet at least occasionally (1) or not (0).
- **intfreq –** Ranging from 0 (Less often) to 4 (Almost constantly).

Following Questions were asked if Participant does not have cable or satellite TV.

- **cable2 –** Participant did have cable or satellite in the past (1) or not (0).
- **cable3a -** Participant does not have cable or satellite because they don't watch tv (1) or not the reason (0).
- **cable3b -**Participant does not have cable or satellite because the cost is to expensive (1) or not the reason (0).
- **cable3c -**Participant does not have cable or satellite because they can access content online or with antenna (1) or not the reason (0).

Following Question was asked if Participant does have internet at home.

- **bbhome1 –** Participant has dial up internet (1) or high speed internet (2) or Both (3)**.**

Following Question was asked if Participant does have dial up internet.

- **bbhome2 –** Participant confirmed dial up (1) or confirmed high speed internet (2).

Following Questions were asked if Participant does not have broadband internet.

- **bbsmart1 -** Did participant ever have broadband internet at home (1) or not (0).
- **bbsmart2 -** Is participant interested in having broadband internet at home (1) or not (0).
- **bbsmart3a –** Participant does not have broadband internet at home, because of the price of subscription (1) or not (0).
- **bbsmart3b -** Participant does not have broadband internet at home, because of the price of a computer (1) or not (0).
- **bbsmart3c -** Participant does not have broadband internet at home, because a smartphone is enough (1) or not (0).
- **bbsmart3d -** Why don't you have internet at home, because can access internet outside of home (1) or not (0).
- **bbsmart3e -** Participant does not have broadband internet at home, because subscription is not available (1) or not (0).
- **bbsmart3f -** Participant does not have broadband, because of other reasons not mentioned (1) or not (0).

Following Question was asked if Participant answered yes to multiple reasons for not having broadband internet.

- **bbsmart4 -**What reason listed above is the most important reason to participant: Ranging from (1) The monthly cost of a home subscription is too expensive, (2) The cost of a computer is too expensive, (3) Your smartphone lets you do everything online that you need to do, (4) You have other options for internet access outside of your home, (5) Broadband service is not available where you live, or is not available at an acceptable speed.

Control Variables

- **sex -** Male (1), Female (0)
- **age -** Participants age
- **agegen –** Age categories by Generation: Millennials (18-34), Gen X (35-50), Younger Boomers (51-60), Older Boomers (61-69), Silent Generation (70-78), and G.I. Generation (79-97).
- **marital –**Married (1), Not married (0).
- **par -** Participant is a parent (1) or not (0)
- **race -** Participants Race: (1) White, (2) Black or African-American, (3) Asian or Pacific Islander, (4) Mixed race, (5) Native American/American Indian, (6) Other.
- **cregrion -** Participants region: (1) Northeast, (2) Midwest, (3) South, (4) West.
- **inc -** Household income 2014: (1) Less than $10,000, (2) 10 to under $20,000, (3) 20 to under $30,000, (4) 30 to under $40,000, (5) 40 to under $50,000, (6) 50 to under $75,000, (7) 75 to under $100,000, (8) 100 to under $150,000, (9) $150,000 or more.
- **inc_cat -** (1) Less than $10,000 to under $30,000 (2) $30,000 to under $100,000 (3) $100,000 or more.
- **stud -** Participant is a student (2) full time (1) part time and (0) not a student.
- **emplnw –** Participant works (2) full time (1) part time and (0) not working.
- **educ2 -** Highest achieved level of education (1) Less than high school (Grades 1-8 or no formal schooling), (2) High school incomplete (Grades 9-11 or Grade 12 with NO diploma), (3) High school graduate (Grade 12 with diploma or GED certificate), (4) Some college, no degree (includes some community college), (5) Two year associate degree from a college or university, (6) Four year college or university

degree/Bachelor's degree (e.g., BS, BA, AB), (7) Some postgraduate or professional schooling, no postgraduate degree, (8) Postgraduate or professional degree, including master's, doctorate, medical or law degree (e.g., MA, MS, PhD, MD, JD).

In order to examine the reasons that individuals will or will not have cable and will or will not have broadband internet two variables were created from combining already mentioned variables. In order to create the variable *cable_cat* the variables *cable1, cable3a, cable3b,* and *cable3c* were combined. In order to create the variable *broadband_cat* the variables *bbhome1, bbhome2, bbsmart3a, bbsmart3b, bbsmart3c, bbsmart3d, bbsmart3e, bbsmart3f,* and *bbsmart4* were combined.

- **cable_cat -** Having cable (1) Do not have cable because don't watch television (2) Do not have cable because of cost (3) Do not have cable because can access content online or with antenna (4) Do not have cable because of cost and don't watch television (5) Do not have cable because can access content online or with antenna and don't watch television (6) Do not have cable because can access content online or with antenna and cost (7) Do not have cable because of all reasons (8).
- **broadband_cat –** Having broadband internet (1) Do not have broadband because it is to expensive (2) Do not have broadband because a computer is to expensive (3) Do not have broadband because smartphone is enough (4) Do not have broadband because access internet outside of home (5) Do not have broadband because its not available (6) Do not have broadband internet for other reasons (7).

The dataset does not ask how much time is spent using each media outlet, which was already mentioned, but the dataset does ask participants if they currently have a home Internet subscription and if they have a cable TV subscription. The participants are also asked reasons they do not have the subscription which includes the internet when speaking of cable television and includes smartphone as a reason for not having home internet. When asking if the internet is the reason the participant no longer has cable it also includes antenna. This is a potential limitation but antennas have always been an option yet cutting cable did not become popular until the internet was able to accomplish all functions of television. Therefore, it is believed to be reasonable to make the assumption that if the participant's answers yes to the question it is at least partly due to the internet and not just having an antenna. The variables being used to examine the displacement of cable television and the internet may not be in line with past research but these variables are showing if these participants actually have already displaced these media outlets with the others. In past research the amount of time and the time of day was examined to evaluate whether one media was being replaced by another. In this study actually not subscribing to these forms of media is being examined and this information can be very important for cable companies and for those looking to advertise.

In order to examine the first hypothesis we will run a multiple logistic regression on *Intmob* by *agegen* along with control variables to see if there are any statistically significant differences by generations. To examine the second hypothesis we ran two multiple logistic regressions on the variables *Home4nw* and one on the variable *Cable1* both by *Inc*, *Race*, and the other control variables to see if there is statistical significance by race or income. To examine the third hypothesis a multinomial logistic regression was run on *broadband_cat* by the variables *Bbsmart1, Bbsmart2, Intmob, inc_cat, sex, marital, par, stud, educ2, intfreq, cable1, race* with

white as the reference group, *agegen* with Millennials as the reference group, and cregion with Midwest as the reference group. To examine the final hypothesis a multinomial logistic regression was run on *cable_cat* by the variables *cable2, Intmob, inc_cat, sex, marital, par, stud, educ2, intfreq, emplnw, cable1, race* with white as the reference group, *agegen* with Millennials as the reference group, and cregion with Midwest as the reference group. Equations for all of the models can be found in appendix A.

Results

Throughout this section we will be speaking of odd ratios and relative risk ratios, which are calculated as exponentiations of the coefficients. According to the results of model 1, which can be viewed in Table B1 of appendix B, examining the first hypothesis all generations are statistically significant in relation to the reference group the Millennials. Net of all other factors in the model; Generation X odds of using the mobile internet go down 65% in comparison to Millennials, which is a proportionate decrease, not an absolute one ($p < 0.01$). All the results discussed from the model are controlling for all other factors included in the model and these increases/decreases are proportionate, not absolute. Younger boomers odds of using the mobile internet go down 90% in comparison to Millennials ($p < 0.001$). Older boomers odds of using the mobile internet go down 94% in comparison to Millennials ($p < 0.001$). The Silent Generations odds of using the mobile internet go down 97% in comparison to Millennials ($p < 0.001$). Finally, G.I. Generation odds of using the mobile internet go down 95% in comparison to Millennials ($p < 0.001$). The second youngest generation, Generation X, seems to be more likely to use the mobile internet than the other four generations who drop around 90% or above in relation to the Millennials.

According to the model for every category increase in education level the odds of using the mobile internet are 1.11 times larger ($p < 0.01$). It can also be noted that the model identified two races significantly different from being white. Being Asian or Pacific Islander in comparison to being white raises the odds of using the mobile internet by 822% ($p < 0.05$) and being Black or African American in comparison to being white raises the odds of using the mobile internet by 57% ($p < 0.05$). It is interesting that being a parent in comparison to not being a parent raises the odds of using the mobile internet by 88% net of all other factors, which is a proportionate increase, not an absolute one ($p < 0.01$). This could be due to that fact the parents are exposed to the mobile internet from their children. It is also interesting to note that according to the model being male, in comparison to female, the odds of using the mobile internet are 0.71 times lower, net of all other factors ($p < 0.001$). Men seem to be less likely to use the mobile internet in comparison to females.

When running the logistic model (Table B2) on having or not having cable television we again see statistical significance for all generations in relation to Millennials. Net of all other factors in the model, Generation X odds of having cable go up 74% in comparison to Millennials, which is a proportionate increase, not an absolute one ($p < 0.01$). All the results are controlling for all other factors included in the model and these increases/decreases are proportionate, not absolute. Younger boomers odds of having cable go up 119% in comparison to Millennials ($p < 0.001$). Older boomers odds of having cable go up 180% in comparison to Millennials ($p < 0.001$). The Silent Generation odds of having cable go up 410% in comparison to Millennials ($p < 0.001$). Finally, G.I. Generation odds of having cable go up 398% in comparison to Millennials ($p < 0.001$). It appears that the older generations appear to value having cable television more so than the younger generations.

It can also be noted that for every category increase in education level the odds of having cable are 0.93 times lower ($p < 0.05$). It is also worth mentioning that being from the West in comparison to the Midwest lowers the odds of having cable by 38% ($p < 0.05$). The model identified two races significantly different from being white. Being Native American or American Indian in comparison to being white lowers the odds of having cable by 68% ($p < 0.05$) and being Black or African American in comparison to being white raises the odds of having cable by 48% ($p < 0.05$). According to the model, for every category increase in income the odds of having cable are 1.24 times larger ($p < 0.001$). We do see significance by race and income so there does appear to be some sort of digital divide.

When running the logistic model on having or not having a home internet subscription (Table B2) we see that net of all other factors, being Black or African American in comparison to being white lowers the odds of having a home internet subscription by 46%, which is a proportionate decrease, not an absolute one ($p < 0.01$). All the results discussed from the model are controlling for all other factors included in the model and these increases/decreases are proportionate, not absolute. According to the model, for every category increase in income the odds of having home internet are 1.26 times larger ($p < 0.001$). It can also be noted that for every category increase in education level the odds of having home internet are 1.21 times higher ($p < 0.001$). It is also interesting to note that according to the model being male, in comparison to female, the odds of having home internet are 0.61 times lower ($p < 0.01$). Finally, being married in comparison to not being married raises the odds of having home internet by 95% ($p < 0.001$). Since being African American and having lower income/education level lowers the odds of having a home internet subscription we again do see evidence that there still is a digital divide in the United States.

According to the multinomial logistic model examining the third hypothesis (Table B3) for those who do not have internet but want to have home broadband internet (vs. those who don't desire broadband internet), their relative risk of not having home broadband internet because the mobile internet is enough goes down by 73% compared to having home internet ($p < 0.05$). All the results are in comparison to having broadband internet, controlling for all other factors included in the model, and these increases/decreases are proportionate, not absolute. For those who are married (vs. those who are not married), their relative risk of not having home internet because the mobile internet is enough goes down by 0.35 ($p < 0.05$). This could be due to the fact being married allows for more income and therefore this group is more willing to pay for broadband internet. For those who are Male (vs. those who Female), their relative risk of not having home broadband internet because the mobile internet is enough goes up by 4.19 ($p < 0.01$). Also for those who are Male (vs. those who Female), their relative risk of not having home broadband internet because the cost of a computer goes up by 3.74 and their relative risk of not having home broadband internet because they access internet outside of home goes up by 3.42 ($p < 0.05$). Men seem to be more likely to not have home broadband internet in favor of the mobile internet and due to computer cost, this is interesting and could be examined further in future research. Finally being from the Northeast (vs. being from the Midwest) increases the relative risk of not having broadband internet because they access internet outside of home goes up by 6.20 ($p < 0.05$). It appears that individuals who are from the Northeast are more willing to not have broadband because they will access internet somewhere else. This could be examined in more detail because there must be some reason for this, potentially the Northeast has more public places in which people can access the internet. The results did find statistical significance for the variable mobile internet. Using the mobile internet, in comparison to those who do not, increase

the relative risk of not having broadband internet because the mobile internet is enough goes up by 39183.47e+7 ($p < 0.01$). This shows that if an individual does use the mobile internet at least occasionally they are more likely to not have broadband internet because the mobile internet allows them to accomplish what they need internet wise and supports the hypothesis.

According to the multinomial logistic model examining the final hypothesis (Table B4), being from the West (vs. being from the Midwest) decreases the relative risk of not having cable because of internet/antenna by 0.08 and decreases the relative risk of not having cable because of cost and internet/antenna by 0.12, compared to having cable, net of all other factors ($p < 0.05$). This is interesting and shows that individuals from the West are less likely to cut cable because of the internet than individuals from the Midwest, on average.

For every category increase in internet frequency the relative risk of not having cable because the internet/antenna is enough goes up by 177.89% compared to having cable, net of all other factors ($p < 0.01$). All the results from the model are in comparison to having cable television, controlling for all other factors included in the model, and these increases/decreases are proportionate, not absolute. For every category increase in internet frequency the relative risk of not having cable because the internet/antenna is enough and do not watch TV goes up by 122.63% ($p < 0.05$). For every category increase in internet frequency the relative risk of not having cable because the internet/antenna is enough and cost goes up by 116.32% ($p < 0.01$). For every category increase in internet frequency the relative risk of not having cable because of all reasons goes up by 134.12% ($p < 0.01$). For those who have home internet (vs. those who do not) their relative risk of not having cable because the internet/antenna is enough goes up by 7.72 ($p < 0.05$). Finally, for those who use the mobile internet (vs. those who do not) their relative risk of not having cable because of all reasons goes up by 12.09 ($p < 0.01$). For those who use the

mobile internet (vs. those who do not) their relative risk of not having cable because of cost and the internet/antenna is enough goes up by 13.98 ($p < 0.01$). For those who use the mobile internet (vs. those who do not) their relative risk of not having cable because the internet/antenna is enough goes up by 18.47 ($p < 0.05$). We see that according to the three variable which are related to having/using internet increase the odds of not having cable for reasons which include internet. This gives evidence to support the hypothesis that the internet is showing signs of displacing cable television.

Discussion

Due to the fact that all generations have statistically significant differences from the youngest generation, the Millennials, when it comes to using the mobile internet we must accept the null hypothesis that there are differences in the use of the mobile internet by age. We do see the odds of using the mobile internet is higher for those from Generation X when compared to the older generations. This model did give us some important information about those who do and do not use the mobile internet. We see that African Americans and Asian or Pacific Islander appear to be more likely to use the mobile internet than Whites in the U.S and the reason why these groups are more likely to use the internet may be an interesting and hard to answer question. We also see that parents are more likely than non-parents to use the mobile internet, this could be due to the fact that parents are exposed to the mobile internet through their children who are early adapters of the mobile internet. It will be interesting to see if parents still use the mobile internet more than non-parents in the future. According to the results females are more likely to use the mobile internet than males this result is interesting and may need to be looked into further in the future. We can also note that as individuals rise in income and in education level they are more likely to use the mobile internet.

Since there was statistical significance for income in both the cable model and home internet model we did not find support for the second hypothesis that the digital divide is narrowing. The more income the more likely people will subscribe to home internet and cable TV, on average. It was interesting to see that all generations have statistically significant differences from the youngest generation the Millennials when it comes to having cable. It appears that the Millennials are less likely than all other generations to subscribe to cable TV, on average. This could be due to the fact Millennials are younger and more prone to mobile internet therefore they do not feel having a cable is as important since the internet can accomplish almost all functions of cable TV. We also see that if individuals are African American they are more likely to have cable in comparison to whites but when it comes to having home internet the opposite is true, on average. African Americans seem to value having cable more so than the internet at home. Married individuals also seem to be more likely to have home internet than single individuals, on average. This could be due to the fact there are potentially two incomes and therefore they have more money and are more willing to subscribe, further proving there still is a digital divide.

We did find supporting evidence for the third hypothesis because there was statistical significance for the use of the mobile internet in relation to not having home broadband due to the mobile internet being enough, on average. What this mean is that if people are using the mobile internet at least occasionally they are more likely to not have broadband internet in favor of using the mobile internet to satisfy their internet usage, on average. We also see that being in the higher income group in comparison to the lowest income group makes one more likely to not have broadband internet due to the mobile internet being enough, on average. This shows that those who are choosing to not have broadband internet subscriptions are not doing so because of

cost since the highest income group is more likely than the lowest. Given this information we can reject the null hypothesis in favor of the alternative that the mobile internet is showing signs of displacement of broadband internet.

We did find supporting evidence for the final hypothesis that the cable television is being displaced by the internet. As internet frequency increases the odds of not having cable due to the internet/antenna being enough went up compared to having cable, on average. We can also see that individuals who have home internet (compared to those who do not) the odds of not having cable because the internet/antenna is enough increases compared to having cable, on average. Finally we see that for those who use the mobile internet (vs. those who do not) the odds of not having cable because the internet/antenna is enough increases compared to having cable, on average. We see that for those who have home internet, those who use the mobile internet, and those who use the internet more frequently seem to be more willing to "cut the cord" and not have cable TV.

Conclusion

More research on the use of the mobile internet and how it may be changing and impacting the ways in which people take in information needs to be done. There will always be a need for more research in relation to the mobile internet because the mobile internet is constantly evolving with new devices and apps being created to please all types of individuals. This study did have some limitations which should be mentioned. Most importantly, in this study the assumption that the internet is the reason people no longer have cable when the question also mentions using an antenna. Most people who do cut cable do not rely strictly on the internet but tend to use the internet along with an antenna. It is believed that since the shift away from cable has begun after the internet has advanced and replaced almost all functionality of cable television

that though it is often paired with an antenna it is the main reason the shift began. This is an assumption when examining the final hypothesis. People may be willing to not have cable because the internet is enough, but people will be less willing to not have cable and only have an antenna. In future research the internet and antenna should be separated to see if people do rely on one or the other or if they truly are a pair in displacing cable TV. A larger sample would be better for future research because even with a sample size of 2001 there were only 391 who did not have broadband internet with reason and there were only 371 who did not have cable television with reason. In the future when examining the displacement of one media by the other it is important to ask not only if an individual uses each media but also how often and for what reasons. This information can help to better examine the different reasons people use different media and whether or not it may be changing over time.

The results do show there may be a shift starting in the way in which individuals in the United States use media. As the mobile internet continues to grow and as more individuals continue to get more and more comfortable with the mobile internet we may soon see that people really are shifting from the home internet to the mobile internet which would match with our findings in this study. We do also see that the internet is beginning to displace cable television. This is important information for cable companies and for television networks. When looking at the graph in Appendix C on can see that for all categories involving not having cable because of the internet there is an increase as internet frequency increases and there is a decrease in all other categories as internet frequency increases. The graph also displays how the Millennials are more willing to give up cable in favor of the internet as they increase in internet frequency in comparison to all other generations. This shows that as the younger generations grow older companies need to prepare for people to be less willing to subscribe to cable. These companies

need to prepare for a shift in users and work to find a way to have some function the internet does not. Another option for cable companies is to offer their cable subscriptions on all devices like laptops and smartphones and some companies like AT&T are already beginning to do this. In a new commercial released in April of 2017 Mark Wahlberg is s spokesman for AT&T and the commercial begins with Wahlberg stating that the people have "updated our terms and conditions" and decided that "we want all our things to be television things" (AT&T, 2017). What he means is that televisions are no longer actually TV's but we can consider our tablets, laptops, and phones televisions as well. The commercial also states that "we don't just want some of our television on [mobile devices], we want all of it, all our favorite shows and live channels" (AT&T, 2017). AT&T is now offering unlimited live television and TV shows. Lastly, in the commercial Wahlberg states "we don't just want unlimited data, we want unlimited entertainment" (AT&T, 2017). AT&T is now offering unlimited Direct TV and HBO. AT&T is taking action early and preparing for the future when cable television is will be further displaced by the internet and when the internet will be further displaced by the mobile internet. These finding are very important because these displacement effects can have a huge impact on the success of cable, internet, and mobile device companies in the near future.

Appendix A

Equations

Model A1

(Using Mobile Internet, relative to not) = + X

Where $_1$ = *genage* (Millennials as reference group) as a matrix

$_2$ = *marital* as a matrix

$_3$ = *par* as a matrix

$_4$ = *race* (White as reference group) as a matrix

$_5$ = *cregion* (midwest as reference group) as a matrix

$_6$ = *inc* as a matrix

$_7$ = *stud* as a matrix

$_8$ = *educ2* as a matrix

With a binomial distribution.

Model A2

(Having cable, relative to not) = + X

Where $_1$ = *intmob* as a matrix

$_2$ = *sex* as a matrix

$_3$ = *genage* (Millennials as reference group) as a matrix

$_4$ = *marital* as a matrix

$_5$ = *par* as a matrix

$_6$ = *race* (White as reference group) as a matrix

$_7$ = *cregion* (midwest as reference group) as a matrix

$_8$ = *inc* as a matrix

$_9$ = *stud* as a matrix

$_{10}$ = *educ2* as a matrix

With a binomial distribution.

Model A3

(Having home internet, relative to not) = + X

Where $_1$ = *intmob* as a matrix

$_2$ = *sex* as a matrix

$_3$ = *genage* (Millennials as reference group) as a matrix

$_4$ = *marital* as a matrix

$_5$ = *par* as a matrix

$_6$ = *race* (White as reference group) as a matrix

$_7$ = *cregion* (midwest as reference group) as a matrix

$_8$ = *inc* as a matrix

$_9$ = *stud* as a matrix

$_{10}$ = *educ2* as a matrix

With a binomial distribution.

Model A4

(Outcome relative to having Broadband Internet) = + X

Where $_1$ = *bbsmart1* as a matrix

$_2$ = *bbsmart2* as a matrix

$_3$ = *race* (White as reference group) as a matrix

$_4$ = *inc_cat* (High as reference group) as a matrix

$_5$ = *stud* as a matrix

$_6$ = *marital* as a matrix

$_7$ = *educ2* as a matrix

$_8$ = *par* as a matrix

$_9$ = *sex* as a matrix

$_{10}$ = *genage* (Millennials as reference group) as a matrix

$_{11}$ = *intmob* as a matrix

$_{12}$ = *intfreq* as a matrix

$_{13}$ = *cable1* as a matrix

$_{14}$ = *cregion* (midwest as reference group) as a matrix

With a multinomial distribution.

Possible outcomes range from no broadband internet because it is to expensive, no broadband internet because of the cost of a computer, no broadband internet because the mobile internet is enough, no broadband internet because can access internet outside of the home, no broadband internet because it is unavailable, no broadband internet because of other reasons.

Model A5

(Outcome relative to having Cable) = + X

Where $_1$ = *cable2* as a matrix

$_2$ = *race* (White as reference group) as a matrix

$_3$ = *inc_cat* (High as reference group) as a matrix

$_4$ = *stud* as a matrix

$_5$ = *marital* as a matrix

$_6$ = *educ2* as a matrix

$_7$ = *par* as a matrix

$_8$ = *sex* as a matrix

$_9$ = *genage* (Millennials as reference group) as a matrix

$_{10}$ = *intmob* as a matrix

$_{11}$ = *intfreq* as a matrix

$_{12}$ = *emplnw* as a matrix

$_{13}$ = *home4nw* as a matrix

$_{14}$ = *cregion* (midwest as reference group) as a matrix

With a multinomial distribution.

Possible outcomes range from do not have cable because do not watch, do not have cable because of cost, do not have cable because can access online and with antenna, do not have cable because of cost and do not watch, do not have cable because do not watch and internet/antenna, do not have cable because of cost and the internet/antenna, do not have cable because of all reasons.

Appendix B

Results of Models

Table B1: Model 1

	Dependent variable:
	intmob
genageG.I_Gen	-3.072***
	(0.309)
genageGen_X	-1.038***
	(0.336)
genageOlder_Boomers	-2.738***
	(0.313)
genageSilent_Gen	-3.431***
	(0.345)
genageYoung_Boomers	-2.271***
	(0.307)
marital	-0.024
	(0.159)
par	0.632***
	(0.222)
raceAsian or Pacific Islander	2.221**
	(1.097)
raceBlack or African-American	0.453**
	(0.216)
raceMixed race	0.599
	(0.557)
raceNative American/American Indian	-0.525
	(0.713)
raceOther	0.228
	(0.398)
cregionNortheast	0.256
	(0.227)
cregionSouth	0.307*
	(0.176)
cregionWest	0.365*
	(0.203)
inc	0.282***
	(0.037)
stud	0.247
	(0.216)
educ2	0.108***
	(0.040)
sex	-0.344**
	(0.141)
Constant	1.126***
	(0.340)
Observations	1,640
Log Likelihood	-657.481
Akaike Inf. Crit.	1,354.963
Note:	*p<0.1;* ***p<0.05;*** p<0.01

Table B2: Model 2 and Model 3

	Dependent variable:	
	cable1	home4nw
	(1)	(2)
intmob	0.434**	-0.013
	(0.176)	(0.263)
sex	-0.243*	-0.489***
	(0.129)	(0.171)
genageG.I_Gen	1.606***	-0.068
	(0.264)	(0.306)
genageGen_X	0.555***	-0.144
	(0.182)	(0.238)
genageOlder_Boomers	1.028***	0.030
	(0.238)	(0.318)
genageSilent_Gen	1.628***	0.934*
	(0.347)	(0.565)
genageYoung_Boomers	0.786***	-0.421
	(0.208)	(0.259)
marital	0.030	0.668***
	(0.149)	(0.196)
par	-0.392**	-0.112
	(0.161)	(0.206)
raceAsian or Pacific Islander	-0.531	-0.262
	(0.339)	(0.570)
raceBlack or African-American	0.394**	-0.623***
	(0.201)	(0.215)
raceMixed race	0.814*	-0.478
	(0.461)	(0.465)
raceNative American/American Indian	-1.145**	-0.600
	(0.557)	(0.873)
raceOther	0.348	-0.350
	(0.323)	(0.378)
cregionNortheast	0.278	0.070
	(0.224)	(0.275)
cregionSouth	-0.028	-0.050
	(0.168)	(0.216)
cregionWest	-0.472**	0.352
	(0.183)	(0.262)
inc	0.215***	0.228***
	(0.033)	(0.042)
stud	0.067	0.493***
	(0.120)	(0.183)
educ2	-0.077**	0.189***
	(0.036)	(0.050)
Constant	-0.162	-0.013
	(0.279)	(0.405)
Observations	1,638	1,449
Log Likelihood	-781.647	-490.535
Akaike Inf. Crit.	1,605.294	1,023.070
Note:	*p<0.1;* ***p<0.05;*** p<0.01	

Table B3: Model 4

	Dependent variable:				
	No Computer Cost	Mobile Internet	No Outside of Home	Not Available	No Other
	(1)	(2)	(3)	(4)	(5)
bbsmart1	-0.080	-0.570	-0.137	-0.611	-0.114
	(0.564)	(0.455)	(0.522)	(0.533)	(0.590)
bbsmart2	-0.171	-1.305**	-1.947***	0.944*	0.510
	(0.622)	(0.536)	(0.747)	(0.547)	(0.609)
raceAsian or Pacific Islander	1.663	-14.729***	-0.416	-0.006***	1.112
	(1.975)	(0.00000)	(1.914)	(0.000)	(1.880)
raceBlack or African-American	0.024	0.341	-0.065	-0.059	-0.011
	(0.701)	(0.580)	(0.666)	(0.679)	(0.784)
raceMixed race	-14.447***	2.456*	-23.360***	-13.386***	1.171
	(0.00000)	(1.366)	(0.000)	(0.00000)	(1.769)
raceNative American/American Indian	17.713***	16.031***	-12.250***	-4.376***	-6.586***
	(1.112)	(1.112)	(0.000)	(0.000)	(0.000)
raceOther	0.737	-1.717	1.879*	1.082	-0.381
	(1.046)	(1.337)	(1.052)	(1.172)	(1.387)
inc_catLow	-0.310	-1.962***	0.436	-0.491	-1.732**
	(0.721)	(0.609)	(0.769)	(0.762)	(0.709)
inc_catMiddle	-0.638	-0.249	1.612**	0.702	-1.472*
	(0.866)	(0.624)	(0.791)	(0.729)	(0.783)
stud	-0.087	-0.592	0.472	-13.567***	-0.229
	(0.644)	(0.553)	(0.475)	(0.00000)	(0.612)
marital	-0.868	-1.050**	-0.578	-0.587	-0.263
	(0.709)	(0.523)	(0.584)	(0.563)	(0.643)
educ2	0.060	-0.077	0.268*	0.142	0.057
	(0.177)	(0.144)	(0.158)	(0.150)	(0.174)
par	-0.418	-0.108	0.917	0.155	-1.011
	(0.677)	(0.512)	(0.608)	(0.624)	(0.748)
sex	1.320**	1.435***	1.230**	0.614	0.821
	(0.573)	(0.467)	(0.526)	(0.524)	(0.579)
genageG.I_Gen	-2.507*	0.034	-2.022*	-0.659	-0.745
	(1.400)	(0.839)	(1.094)	(1.039)	(1.348)
genageGen_X	0.195	0.086	-0.807	-0.753	-0.400
	(0.726)	(0.597)	(0.724)	(0.790)	(0.845)
genageOlder_Boomers	-0.776	-0.278	-1.029	-0.230	-0.017
	(1.076)	(0.823)	(0.981)	(0.973)	(1.010)
genageSilent_Gen	-21.292***	2.628*	-1.837	0.400	-21.229***
	(0.000)	(1.532)	(1.653)	(1.604)	(0.000)
genageYoung_Boomers	-0.337	-1.474*	-0.928	-0.037	-0.591
	(0.906)	(0.868)	(0.886)	(0.818)	(0.881)
intmob	-1.019	26.694***	-0.408	0.856	-0.667
	(0.803)	(0.562)	(0.738)	(0.978)	(0.862)
intfreq	-0.467**	0.213	-0.335*	-0.267	0.094
	(0.214)	(0.189)	(0.202)	(0.211)	(0.236)
cable1	1.286**	0.051	1.131**	0.448	-1.198*
	(0.627)	(0.489)	(0.566)	(0.568)	(0.660)
cregionNortheast	0.546	-0.320	1.825**	0.685	0.980
	(1.078)	(0.874)	(0.881)	(0.936)	(0.896)
cregionSouth	-0.249	-0.315	-0.260	-0.243	-0.462
	(0.714)	(0.573)	(0.690)	(0.677)	(0.751)
cregionWest	0.524	-0.168	-0.384	-0.731	-0.293
	(0.868)	(0.691)	(0.900)	(0.948)	(0.911)
Constant	-2.713	-24.741***	-4.146**	-3.449**	1.149
	(1.774)	(0.562)	(1.631)	(1.753)	(1.672)
Akaike Inf. Crit.	835.939	835.939	835.939	835.939	835.939
Note:					*p<0.1; **p<0.05;** p<0.01

Table B4: Model 5

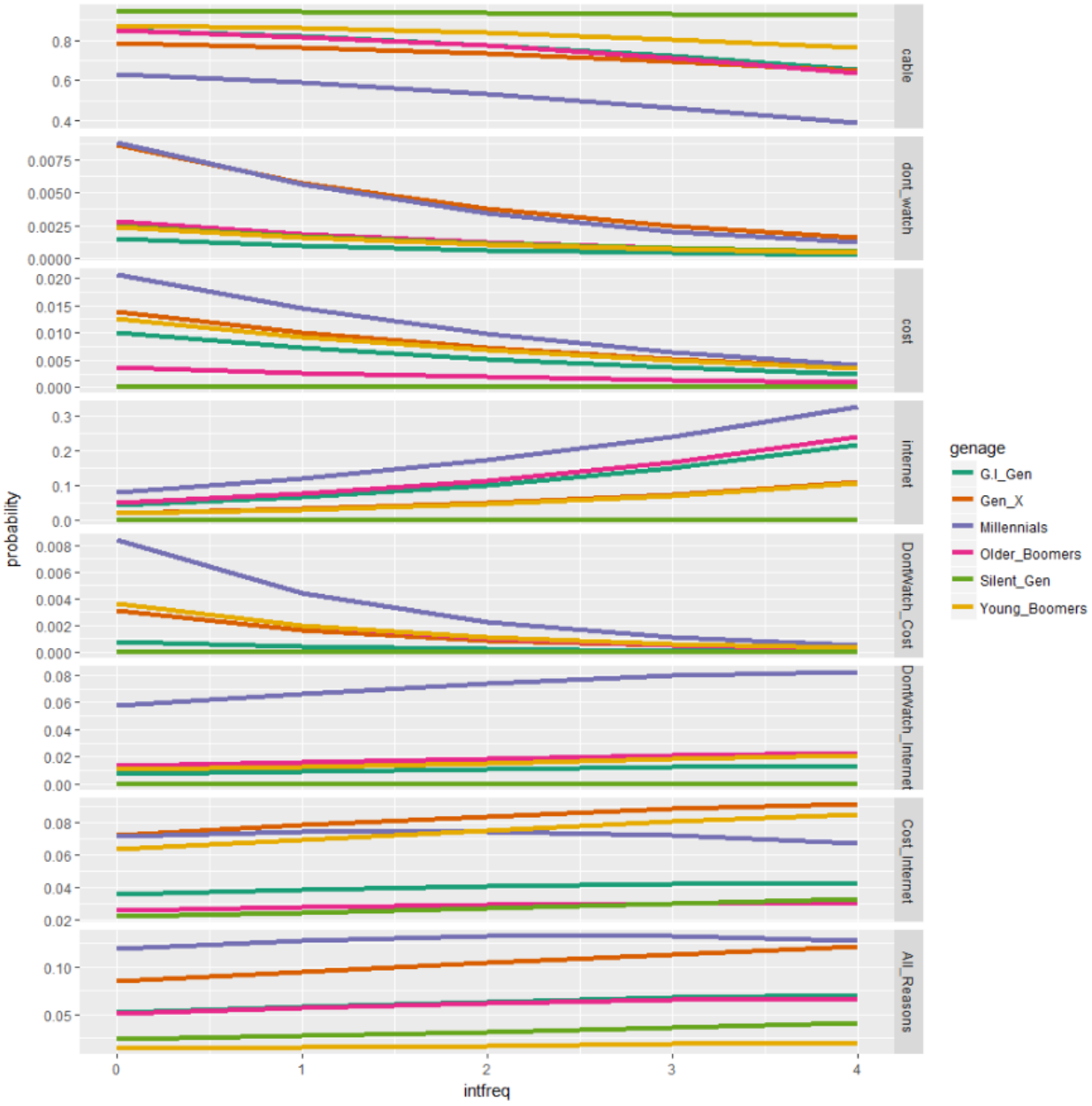
	Dependent variable:					
	cost	internet	DontWatch_Cost	DontWatch_Internet	Cost_Internet	All_Reasons
	(1)	(2)	(3)	(4)	(5)	(6)
cable2	0.711	-0.497	-0.893	-1.466*	0.049	-0.528
	(0.714)	(0.753)	(0.718)	(0.757)	(0.654)	(0.639)
raceAsian or Pacific Islander	-11.233	-11.026	-2.704*	-3.244**	-2.399**	-2.074**
	(95.642)	(81.287)	(1.592)	(1.419)	(1.106)	(1.025)
raceBlack or African-American	-1.035	-1.253	-0.799	-0.250	-1.530*	-1.180
	(0.917)	(1.143)	(1.018)	(1.033)	(0.913)	(0.884)
raceMixed race	-2.974	5.871	-3.357	-4.621	5.568	6.024
	(113.313)	(32.320)	(128.065)	(20.971)	(32.313)	(32.303)
raceNative American/American Indian	-5.117	6.979	5.580	4.716	3.997	-5.821
	(138.203)	(22.738)	(22.743)	(22.727)	(22.733)	(149.744)
raceOther	5.898	7.224	7.332	8.166	7.368	7.460
	(27.766)	(27.773)	(27.761)	(27.763)	(27.754)	(27.753)
inc_catLow	-0.984	-1.126	-1.350	-2.018*	-0.944	-1.083
	(1.054)	(1.116)	(1.075)	(1.142)	(1.017)	(1.003)
inc_catMiddle	-2.935***	-2.108**	-2.678**	-1.795*	-2.007**	-2.015**
	(1.029)	(1.065)	(1.077)	(1.035)	(0.957)	(0.945)
stud	-0.809	0.299	0.140	0.252	0.750	0.473
	(0.844)	(0.646)	(0.688)	(0.650)	(0.556)	(0.547)
marital	1.190*	-0.100	0.840	-0.413	0.370	0.533
	(0.722)	(0.791)	(0.774)	(0.820)	(0.673)	(0.666)
educ2	0.041	-0.108	0.128	-0.012	0.051	-0.006
	(0.185)	(0.207)	(0.201)	(0.211)	(0.173)	(0.171)
par	0.430	-0.817	-0.987	-1.211	-0.454	-1.610**
	(0.840)	(0.889)	(0.902)	(0.918)	(0.779)	(0.768)
sex	-0.565	1.113	-0.283	0.577	0.176	0.250
	(0.664)	(0.738)	(0.711)	(0.729)	(0.606)	(0.596)
genageG.I_Gen	1.654	1.366	-0.647	-0.182	0.924	1.210
	(1.455)	(1.518)	(1.735)	(1.710)	(1.440)	(1.394)
genageGen_X	-0.049	-0.159	-0.252	-0.033	0.904	1.053
	(0.847)	(1.036)	(0.944)	(1.015)	(0.795)	(0.787)
genageOlder_Boomers	-0.020	1.043	-0.262	0.748	0.824	0.691
	(1.424)	(1.408)	(1.384)	(1.465)	(1.256)	(1.204)
genageSilent_Gen	-7.436	-6.034	-8.302	-5.802	1.421	0.838
	(49.135)	(44.794)	(56.313)	(44.320)	(1.728)	(1.715)
genageYoung_Boomers	2.019	1.129	0.926	1.430	2.687**	0.416
	(1.300)	(1.486)	(1.370)	(1.461)	(1.241)	(1.320)
intmob	1.503	2.916**	1.307	3.223**	2.638***	2.493***
	(0.945)	(1.181)	(0.954)	(1.350)	(0.882)	(0.865)
intfreq	0.483	1.022***	0.008	0.800**	0.772***	0.851***
	(0.298)	(0.394)	(0.324)	(0.387)	(0.292)	(0.292)
emplnw	-0.202	-0.431	-0.418	-0.141	-0.275	-0.242
	(0.430)	(0.482)	(0.456)	(0.486)	(0.406)	(0.403)
home4nw	-0.348	2.043**	0.195	1.466	0.737	0.540
	(0.777)	(1.033)	(0.842)	(0.910)	(0.733)	(0.719)
as.factor(cregion)Northeast	-2.122*	-11.712	-2.945*	-0.413	-1.545	-1.888*
	(1.221)	(60.576)	(1.540)	(1.334)	(1.128)	(1.117)
as.factor(cregion)South	-1.712*	-1.829*	-1.032	-0.608	-1.541	-1.496
	(1.011)	(1.088)	(1.064)	(1.208)	(0.984)	(0.973)
as.factor(cregion)West	-2.506**	-2.358**	-1.394	-0.671	-2.100**	-1.849*
	(1.051)	(1.100)	(1.073)	(1.186)	(0.986)	(0.968)
Constant	3.307	2.713	2.727	1.466	2.569	4.344**
	(2.222)	(2.547)	(2.300)	(2.558)	(2.097)	(2.038)
Akaike Inf. Crit.	1,188.080	1,188.080	1,188.080	1,188.080	1,188.080	1,188.080

Note: *p<0.1; **p<0.05;* p<0.01

Appendix C

Visualization for Final Hypothesis

This visualization is not from model 5 but made from a more limited multinomial logistic model of the variable *cable_cat* by the variables *intfreq* and *genage.*



Appendix D

Demographic Information

Table D1: Race

White	Asian/Pacific Islander	Black/ African American	Mixed Race	Native American/American Indian	Other
1513	54	246	49	17	68

Table D2: Age/Generation (*genage*)

Millennials	Generation X	Younger Boomers	Older Boomers	Silent Generation	G.I. Generation
468	396	360	297	164	316

Table D3: Region (*cregrion*)

Midwest	Northeast	South	West
487	313	754	447

Table D4: Income Category (*inc_cat*)

High	Middle	Low
830	647	524

Table D5: Cable Categories (*cable_cat*)

Have Cable	Don't Watch	Cost	Internet	Don't Watch / Cost	Don't Watch / Internet	Cost / Internet	All Reasons
1578	29	53	31	37	30	93	98

Table D6: Broadband Internet Categories (broadband_cat)

Have Broadband	Too Expensive	Computer Cost To High	Mobile Internet is Enough	Access Outside of Home	Not Available	No for Other Reasons
1396	148	49	64	45	34	51

References

App stores: number of apps in leading app stores 2017. Retrieved April 02, 2017, from https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/

AT&T Terms & Conditions - Featuring Mark Wahlberg TV Commercial ad advert 2017 [Advertisement]. (2017, April). Retrieved April 28, 2017, from https://abancommercials.com/vid/16833/det/at-ampt-terms-conditions-featuring-mark-wahlberg-commercial

Baron, N. S., & Campbell, E. M. (2012). Gender and mobile phones in cross-national context. *Language Sciences*, *34*(1), 13-27. Accessed November 20, 2016. doi:10.1016/j.langsci.2011.06.018.

Blumer, J. G., & Katz, E. (1974). The uses of mass communications: Current perspectives on gratifications research. *Beverly Hills: Sage Publications*, 19-32.

Brian, M. (2016, December 12). Netflix and Amazon secure 17 Golden Globe nominations. Retrieved April 02, 2017, from https://www.engadget.com/2016/12/12/netflix-amazon-golden-globe-nominations-2017/

Brown, K., Campbell, S. W., & Ling, R. (2011). Mobile phones bridging the digital divide for teens in the US?. *Future Internet*, *3*(2), 144-158. Accessed November 21, 2016. doi:http://dx.doi.org.ezproxy.cul.columbia.edu/10.3390/fi3020144.

Chaffey, D. (2017, March 01). Mobile marketing statistics 2017. Retrieved April 02, 2017, from http://www.smartinsights.com/mobile-marketing-analytics/mobile-marketing-statistics

Chan, M. (2015). Examining the influences of news use patterns, motivations, and age cohort on mobile news use: The case of Hong Kong. *Mobile Media & Communication*, *3*(2), 179-195.

Dimmick, J. W. (2002). *Media competition and coexistence: The theory of the niche*. Routledge.

De Reuver, M., Nikou, S., & Bouwman, H. (2016). Domestication of smartphones and mobile applications: A quantitative mixed-method study. *Mobile Media & Communication*, *4*(3), 347-370. Accessed November 21, 2016. doi: 10.1177/2050157916649989.

De Reuver, M., Ongena, G., & Bouwman, H. (2013). Should mobile Internet be an extension to the fixed web? Fixed-mobile reinforcement as mediator between context of use and future use. *Telematics and Informatics*, *30*(2), 111-120. Accessed November 21, 2016. doi:10.1016/j.tele.2012.02.002.

De Waal, E., & Schoenbach, K. (2010). News sites' position in the mediascape: Uses, evaluations and media displacement effects over time. *New Media & Society*.

Greer, C. F., & Ferguson, D. A. (2015). Tablet computers and traditional television (TV) viewing Is the iPad replacing TV?. *Convergence: The International Journal of Research into New Media Technologies*, *21*(2), 244-256.

Horrigan, J. B., & Duggan, M. (December 2015). Home Broadband 2015 The share of Americans with broadband at home has plateaued, and more rely only on their smartphones for online access. *Pew Research Center*, *21*. http://www.pewinternet.org/2015/12/21/home-broadband-2015/

Kayany, J. M., & Yelsma, P. (2000). Displacement effects of online media in the socio-technical contexts of households. *Journal of Broadcasting & Electronic Media*, *44*(2), 215-229.

Lenhart, A. (2015). Teens, social media & technology overview 2015. *Pew Research Center*, *9*. http://www.pewinternet.org/2015/04/09/teens-social-media-technology-2015/

Lin, W. Y., Zhang, X., Jung, J. Y., & Kim, Y. C. (2013). From the wired to wireless generation? Investigating teens' Internet use through the mobile phone. *Telecommunications Policy*, *37*(8), 651-661. Accessed November 20, 2016. doi:10.1016/j.telpol.2012.09.008.

Newell, J., Pilotta, J. J., & Thomas, J. C. (2008). Mass media displacement and saturation. *The International Journal on Media Management*, *10*(4), 131-138.

Quarterly number of Netflix streaming subscribers in the U.S. 2016. Statistic. Retrieved April 02, 2017, from https://www.statista.com/statistics/250937/quarterly-number-of-netflix-streaming-subscribers-in-the-us/

Ramirez Jr, A., Dimmick, J., Feaster, J., & Lin, S. F. (2008). Revisiting interpersonal media competition: The gratification niches of instant messaging, e-mail, and the telephone. *Communication Research*, *35*(4), 529-547.

Reardon, M. (2011). CNN live news comes to iPad, other mobile devices. *CNET. Available at: news. cnet. com/8301-30686_3-20080409-266/cnn-live-news-comes-to-ipad-other-mobile-devices (accessed 27 July 2011)*.

Rosengren, K. E., Wenner, L. A., & Palmgreen, P. (Eds.). (1985). *Media gratifications research: Current perspectives*. Beverly Hills, CA: Sage Publications.

Waniata, R. (2017, March 29). Cord cutting 101: How to quit cable for online streaming video. Retrieved April 02, 2017, from http://www.digitaltrends.com/home-theater/how-to-quit-cable-for-online-streaming-video/

Westlund, O., & Färdigh, M. A. (2011). Displacing and complementing effects of news sites on newspapers 1998–2009. *International Journal on Media Management*, *13*(3), 177-194.

Whitney, D. (2011). Stations' mobile apps showing promise. TVNewsCheck. Accessed March 20, 2017, from http://www.tvnewscheck.com/article/49813/stations-mobile-apps-showing-promise

Worden, N. (2011). ESPN launches app for mobile-TV devices. *The Wall Street Journal*. Accessed March 20, 2017, from https://www.wsj.com/articles/SB10001424052748704013604576248892096438426