COLUMBIA UNIVERSITY

Cell Phone and Smartphone Ownership and Race

Equity Report – MSTU4005

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Introduction

The goal of this report is to provide a review and summary of the disparity in cell phone and smartphone ownership as well as the mobile device usage among difference ethnic groups in the United States of America. The report targets to answer questions such as “which ethnic group has the most cell phone or smartphone”, “what are some the characteristics of people who have cell phones or smartphones and how are the characteristics different from each ethnic group”, “how do different people use their phone differently”, and “what are some of the potential solutions”. Also, the report includes some perspectives on the cause of technology ownership and usage disparity. The data behind in this report is from U.S. Census, Pew Research Center, and the Census Bureau, collected via survey throughout all 50 states. The data from Pew Research Center does not include Asians due to its small ratio to the total population (Smith). Therefore, that particular ethnic group is not being analyzed in this report.

Background and History of Cellphone and Smartphone Ownership

Overall, the ownership of cellphone and smartphone has been increasing for the past decade. Of the adults who were surveyed by Pew Research Center in 2016, 95 percent claimed that they own at least one cellphone device, increased from 65 percent in 2004. Total smartphone ownership increased from 35 percent to 77 percent just from 2011 to 2016 (Pew Research Center). It has been the fast growing device in the United States.

As of 2016, the group that has the most cellphone ownership percentage is the Latinos, with 98 percent of the demographic having at least one cell phone device. Non-Hispanic whites and African Americans both have 94 percent. Moreover, Latino is the fastest growing cellphone adoption group. Back in 2009, it only had 63 percent cell phone ownership, whereas Whites and African Americans had 81 percent and 72 percent respectively. For smartphones, whites have the highest smartphone ownership percentage of 77 percent, followed by the Latinos with 75 percent. And of African Americans, 72 percent have smartphones. It is a very intriguing observation because the Latinos have the highest cell phone ownership percentage but not the smartphone ownership percentage (Lenhart).

The group that had the fastest growing smartphone users is also Whites. In 2011, only 30 percent of Whites had a smartphone. And that figure increased to 66 percent from the year 2011 to 2015. Although Latinos and African-Americans had the highest smartphone ownership ratio at the beginning of the time our data reflected, they didn't grow as quickly as the whites did.

Important Attributes of Cellphone or Smartphone Owners of Each Ethnic Group

Overall, income and education level are statistically two of the most significant attributes of a cellphone or smartphone owner. The general trend is that younger,

richer, and more educated people are more likely than group average to become cell phone or smartphone owner. However, we've also observed that different ethnic groups behave differently when they are compared using the same attribute, such as income.

One example is the difference between the ownership ratio of people with a household income over $30,000 and the ownership ratio of people with less income. Our observation is that the whites and Latinos are less likely to own a cellphone when their household income is significantly below $30,000 than African-American are, even though the cell phone ownership is about the same for all ethnic groups with household income above $30,000. This might indicate that different ethnic groups have different a purchase priority or price sensitivity for cell phones.

Smartphone ownership ratio is 81 percent for African-Americans who have a household income over $50,000. The ratio decreases to 64 percent for African-Americans who have a household income between $30,000 and $50,000. The ratio is 48 percent for African-Americans whose household income is below $30,000. We have also observed that the whites have the greatest gap in smartphone ownership in different income levels. The number of low-income smartphone owners is only less than 50% of that of high-income smartphone owners.

Education is another interesting attribute of smartphone owners to look at. Although

whites and African-Americans have about the same percentage of people who have an education level of high school or less and also own a smartphone, the gap becomes more obvious between whites and African-Americans with some college background or more. To be more specific, the smartphone ownership ratios for less educated (high school or less) whites and African-Americans are 38 and 36 percent respectively. There is merely a difference. However, the ratios are 57 and 71 percent for whites and African-Americans with some college education background. And they are 67 and 75 for the people with an education background of college and more. The gap between the number of white and African-American smartphone owners is the largest at the college level (Pew Research Center).

There are other attributes that create some small differences in smartphone ownership. For example, in another report (Smith), white women are less likely to own a smartphone comparing to an African-American woman (51 vs. 58 percent). Also, African-Americans are more likely to use an Android device than an iPhone (16 vs. 42 percent). Other attributes are not significant enough to provide additional insights with regards to race. Overall, cell phones are becoming the most common technology devices, replacing computers. One reason is that cell phones and smartphones are becoming more and more powerful with more functions they gain every year. Hence, the question to ask is how different ethnic groups use mobile device differently.

Differences in Mobile Device Usage and Smartphone Dependency

Pew Research Center conducted a survey in 2010, asking the U.S. cellphone users how they use their mobile applications (which include those on smartphones). The result shows that the Latinos and African-Americans are more likely to use non-voice application than the whites do. They also use more functions than whites do. In the survey, there was a list of thirteen functions people can use on a mobile, including taking a picture, sending/receiving text messages, accessing the Internet, sending/receiving emails, playing a game, recording a video, sending/receiving instant messages, using a social networking site, watching a video, posting a photo/video online, purchasing a product, and using a status update service. Latinos, on average, use 5.8 functions out of all thirteen. African-Americans use 5.4 functions, and the whites use 3.8 functions.

The percentage of whites is lower than African-Americans or Latinos in all thirteen functions. The four functions that whites have a ratio that's close to the other races' are: taking pictures, sending/receiving text messages, posting photo/video online, purchasing product, and using a status update services. The similarity comes in two ways. These functions are either the most common ones or the least popular ones that only a few people know or want to use. Also, Latinos and African-Americans have very similar function usage trends, with Latinos dominating almost all the functions with three exceptions. African-Americans have the highest usage percentage of entertainment functions such as games, video recording, and music.

There is another important phenomenon among the minorities. And that is "smartphone-dependent". It applies to people who do have home broadband services and have limited options for connecting to the internet other than their smartphones. In the survey conducted by Pew Research Center in 2014, 7% of the total cellphone owing adults are "smartphone dependent". Latinos (13%) and African-Americans (12%) are more likely to depend on their phone for internet access than whites (4%) do. In 2016, 23% of Latinos, 15% of African-Americans, and 9% of whites are considered "smartphone dependent" (Anderson). Moreover, lower-income households also rely heavily on their smartphones for accessing the Internet. 13% of adults with annual household income lower than $30,000 are considered "smartphone dependent".

Short Summary

Latinos have the most cell phones and the least smartphones. Whites have the highest smartphone ownership ratio. Also, Whites are the fastest growing smartphone owners. Whites and Latinos are less likely to own a cellphone when their household income is below $30,000. For African-Americans, there is a huge increase in the smartphone ownership ratio from people who have an education of high school or less to people with some college education. Whites do not use their mobile device as much as Latinos or African-Americans. African-Americans are more of the heavy users of the entertainment functions in their phone comparing to Latinos and Whites. But Whites

are less likely than Latinos and African-Americans to be “smartphone dependent”, which means that Whites are less likely to solely depend on their mobile device for internet access.

Why Don’t Some People Use Cellphone/Smartphone?

Typically, people who have low smartphone ownership ratio are people older than 65, are not well-educated (high school or less), or have low household income (< $30,000). Besides the majority that follows the general trend, there are two groups of people who have significantly less smartphone ownership than people in the same category and in other ethnic groups. The first group is Latinos and Whites with some college background. And the second group is Whites with low-income. But why don’t they use smartphones? The real answer is still unclear. Many research institutions, including Pew Research Center, are reluctant to draw a solid conclusion on why these people don’t use smartphones. However, there are many theories that try to provide some explanations.

One popular theory is that part of the people who don’t use smartphones because they cannot afford them. According to a survey done by Pew Research Center in 2015, 36% of the sample group indicate that smartphones are too expensive (Horrigan). And 23% of smartphone owners have had to cancel their service due to financial constraints. The cost issue is very common among people with low incomes (Anderson). 44% of smartphone owners who have a household income less than $30,000 a year have had

canceled their service at least once in the past. African-Americans and Latinos, two groups which have lower household income than Whites, are more likely to be affected by smartphone costs. Some other major theories are about function benefits and accessibility. 29% of people surveyed in 2015 say their needs are satisfied by their current cellphone and therefore do not need a smartphone. There are also 9% of the same sample group think that smartphones are too complicated (Horrigan).

Problem with Not Using a Smartphone

Many smartphone users consider their phone an important source of information. According to Pew's study in 2015, 62% of smartphone owners have used their phone to look up about a health condition; 57% have used it to do online banking; 43% have used it to look up information about a job; 40% have used it to look up government service information; and 30% have used it to take a class or get education content. (Pew Research Center) When people are not using smartphones, these activities become less common. The average usage for some of the same activities is lower than the usage of these internet activities on smartphones. For example, the average population percentage is 48% for people who search health information online. And 62% of smartphone users perform the same activity on their phone. Only 27% of people search job online, and 43% of smartphones use their phones to do it (Statista.com). The cause of these disparities is still unclear. But it is less likely for people to use other devices to get the important information that can impact their lives.

Limitation of Smartphone

Although smartphones can connect to the internet and some smartphone-dependent people only use smartphones to do so, this approach has many limitations. To start, smartphone displays are often too small to read, especially for documents that require back-and-forth navigation, such as an Excel spreadsheet or a video with small font. For smartphone-dependent users, another issue would be the data limitation. Many telecom companies still have a limit for how much cellular data a smartphone can use. Access speed that causes by hardware limitations will also create a negative impact on internet activities. All these would limit the type of activities that can be performed on the device, results in fewer data-consuming activities such as watching videos. This would directly undermine some of video-related benefits, such as smartphone education.

Solution for Disparity

Although there are no organizations that provide cellphone or smartphone access targeting any specific ethnic groups or any groups with a specific education level, organizations are seemingly targeting people with lower income by providing affordable or even free smartphones and cellular internet access. And this might also be effective to solve disparity among ethnic groups and different education levels because minorities and people low education level tend to have lower incomes. And

they are exactly who have shown a shortage in smartphone ownership and internet access.

One example would be Lifeline, a government benefit program by the Federal Communication Committee (FCC). The program provides free smartphones and cellphone plans cheaper than $10 to low-income families. These plans support unlimited text and 1GB mobile data with the very fast 3G connection.

Some projects indirectly become part of the solution. For example, the LinkNYC project has created over 7,500 infrastructures on the street that provide free public wifi and work as a super-size smartphone at the same time. This would increase the use of smartphones for people who are sensitive to data costs. Combining with the Lifeline program, they are very promising projects that might become part of the efforts to eliminate smartphone ownership and usage disparity.

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