

# TV Untethered:

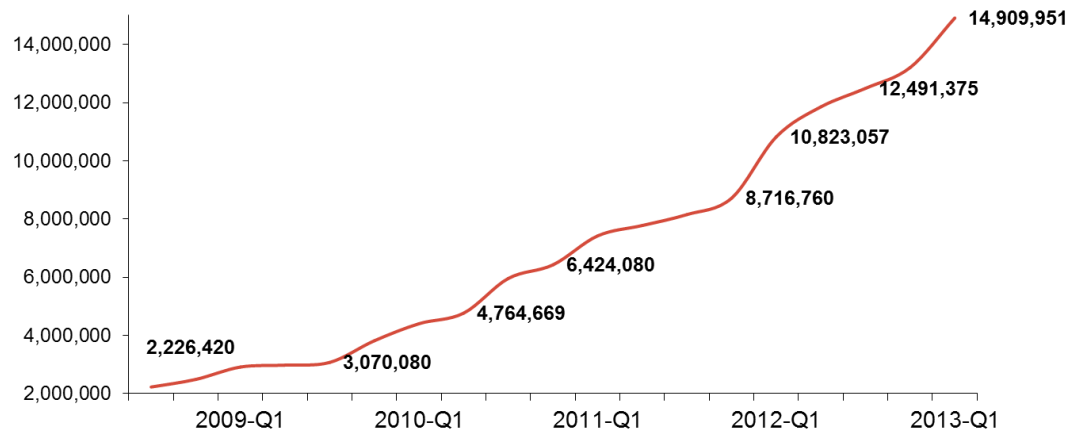
## Quantifying Mobile TV Viewing and its Impact

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### CONTEXT

Video consumption on smartphones and tablets in the US is becoming a mainstream activity. With smartphone penetration now at 60% in the US, the volume of video consumed on mobile devices is reaching a critical mass (see **Exhibit 1**).

**EXHIBIT 1: GROWTH IN MINUTES OF VIDEO WATCHED ON MOBILE DEVICES (2009-2013)**



Source: Nielsen Mobile Device Insights, Q1 2013

While much of this “video” viewed on mobile devices is not professionally produced, the scope of this trend is simply too broad for anyone interested in audience measurement to ignore.

### OBJECTIVES & METHODOLOGY

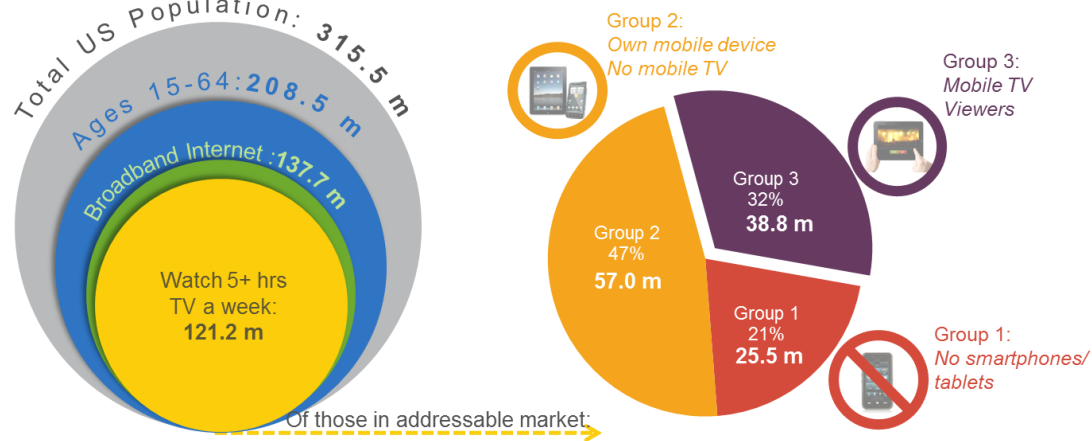
The Council for Research Excellence conducted an extensive study to gain a better understanding of mobile video usage to provide insight for cross platform measurement. More specifically, this research aimed to...

- (1) Quantify how much time and how often people watch TV programming on mobile devices
- (2) Determine what motivates consumers to watch TV on mobile devices
- (3) Profile mobile viewing occasions

The target market we covered did *not* include all TV watching households or individuals in the US. We focused on US residents who...

- a) Are between the ages of 15 and 64 years old
- b) Have broadband Internet access at their primary place of residence
- c) Watch a *minimum* of 5 hours of TV programming per week (see **Exhibit 2**)

## EXHIBIT 2: SIZE OF “MOBILE TV VIEWING POPULATION”



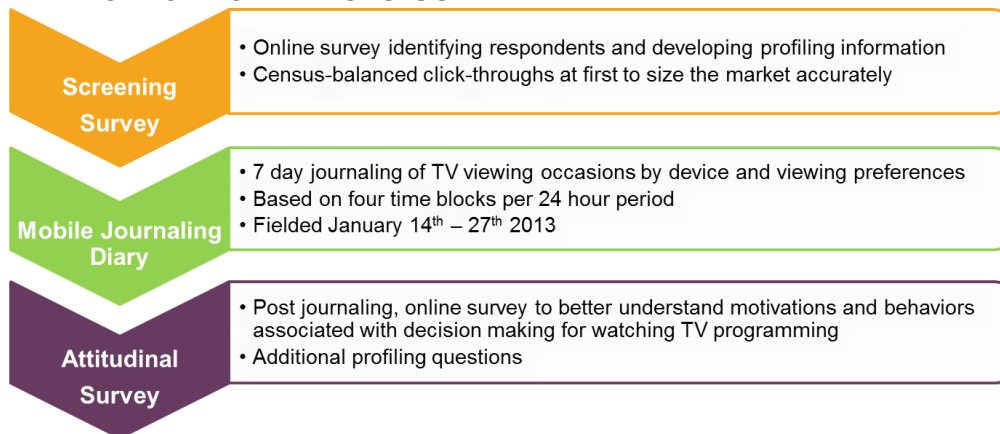
We used census-balanced click-throughs for the initial part of our fielding efforts by age, gender, household income and ethnicity (including balancing for “English-dominant” language spoken at home vs. “Spanish-dominant” among Hispanics).

Among this total population of over 121 million people, a third (nearly 39 million) reported watching TV programming or movies on a smartphone and/or tablet on a regular basis: all had done this within the past month, and all expected to do it within the next week.

## METHODOLOGY

Once qualified through the screener process, all participants then did an online journaling exercise over the course of one week (we split the sample equally between the week of January 14<sup>th</sup> and January 21<sup>st</sup>, 2013). Each day, participants were notified via push notifications on the mobile app, emails and text messages at specific local times to record their TV viewing for a specific time-block during that day. We followed up the TV journaling exercise with an attitudinal survey to understand more about their motivations for different TV viewing behaviors during the journaling week (see **Exhibit 3**).

## EXHIBIT 3: RESEARCH METHODOLOGY






- 1) **Participation:** We needed to strike a balance between minimizing -out rates vs. being strict enough that each participant we used for our final analysis gave us enough relevant data to work with. Towards that end, we required that...

- a. Every participant had to complete all three phases of the research to be in our final data file. This allowed us to merge together attitudinal data, demographic, technographic and the journal-based TV occasion data into one cohesive analysis.
  - b. Every participant had to log at least one journal *per day*; however, we did not require every participant to complete all four journaling blocks every day.
  - c. Each participant had up to 24 hours from the time they received notification to fill out a given time-block journal to do this
- 2) **Incentive Structure & Minimizing Drop-outs:** We planned for a 50% drop-out rate, but structured our incentives to minimize this. We added additional incentives for every journaling task completed (i.e., even though participants technically only had to complete one journal per day to complete, they would get higher incentives for journaling all four times each day). We also had an extra incentive offered to people who finished all 7 days of the journaling plus the attitudinal survey. In the end, the highest drop-out point was in between the screener survey and actually getting the mobile journaling app installed and starting on it (we recruited more broadly than just from standing mobile research panels because we wanted broader representation). For those who did get started, drop-out rates were quite minimal because we kept the journaling experience very brief (~5 minutes max to fill out any given journal check-in), the frequency manageable (no more than 4 entries required per day), and the incentives structured to motivate full participation.

#### SAMPLE SIZE AND DATA MANAGEMENT

We had over 3,000 mobile viewers analyzed, logging over 49,000 journals covering 230,000 TV viewing occasions, and we were able to compare them against over 1,500 “Group 2” TV viewers (own mobile devices but no mobile TV viewing) and over 1,200 “Group 1” participants (do not own mobile devices) (see Exhibit 4).

#### EXHIBIT 4: SAMPLE SIZE AND FRAME:

<b>Sample</b>	<ul style="list-style-type: none"> <li>• US 15-64 yrs olds</li> <li>• Broadband Internet access at home</li> <li>• Watch 5+ hours of TV per week</li> </ul>		
<b>Group Definitions</b>	 <b>Group 1</b> <ul style="list-style-type: none"> <li>• No mobile devices</li> </ul>	 <b>Group 2</b> <ul style="list-style-type: none"> <li>• Own mobile devices</li> <li>• Do <u>not</u> watch TV on mobile devices</li> </ul>	 <b>Group 3</b> <ul style="list-style-type: none"> <li>• Own mobile devices</li> <li>• <u>DO</u> watch TV on mobile devices</li> </ul>
<b>Sample Size</b>	<ul style="list-style-type: none"> <li>• 1,291 respondents</li> <li>• 14,405 journal entries</li> <li>• 65,756 viewing occasions</li> </ul>	<ul style="list-style-type: none"> <li>• 1,528 respondents</li> <li>• 21,648 journal entries</li> <li>• 96,925 viewing occasions</li> </ul>	<ul style="list-style-type: none"> <li>• 3,067 respondents</li> <li>• 49,318 journal entries</li> <li>• 230,506 viewing occasions</li> </ul>




#### MOBILE TV VIEWER PROFILING

Although mobile TV watching is approaching the mainstream (one-third of our addressable market does it), it is far from ubiquitous at this point. This begs the question: how are mobile viewers different from the rest of the general TV watching population?

By far the biggest demographic difference between current mobile TV viewers vs. the rest of the US is that **they are younger** (see Exhibit 5). They are also more highly educated and have higher income than the rest of the

universe we sampled. Additionally, we found several ethnic skews: Asian Americans, African-Americans and Hispanics (English-dominant language spoken at home) are more likely to watch mobile TV on a regular basis.

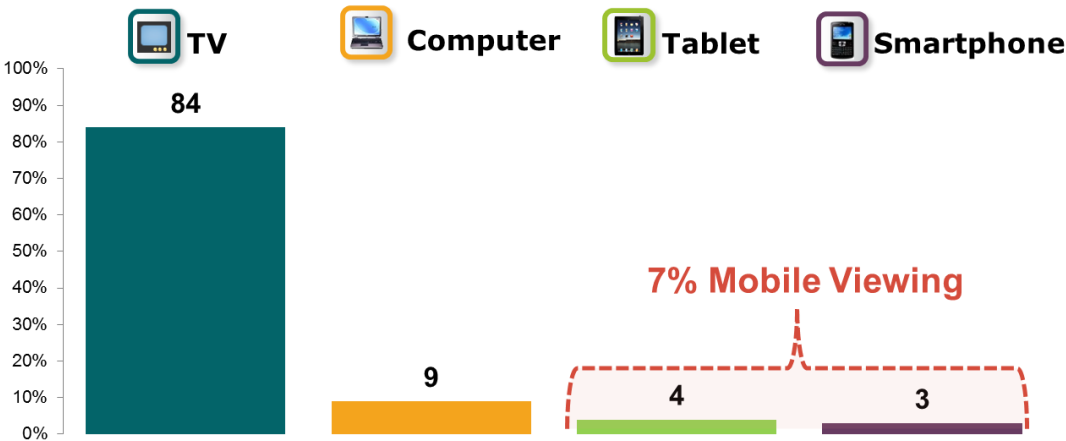
**EXHIBIT 5: HOW CURRENT MOBILE TV VIEWERS ARE DIFFERENT**

	 <b>Group 1</b> No Mobile Devices	 <b>Group 2</b> No Mobile TV Viewing	 <b>Group 3</b> Mobile TV Viewers
<b>Demographics</b>	<ul style="list-style-type: none"><li>• Tend to be older (mean age 44)</li><li>• HH income is lower</li><li>• More likely Caucasian</li><li>• More unemployed and retired</li></ul>	<ul style="list-style-type: none"><li>• Age falls in between Group 1 and Group 3 (mean age 40)</li><li>• More likely Caucasian</li><li>• HH income similar to Group 3</li><li>• More employed professionals</li></ul>	<ul style="list-style-type: none"><li>• Tend to be younger (mean age 35)</li><li>• HH income is higher</li><li>• Ethnic Skew<ul style="list-style-type: none"><li>• Asian-American</li><li>• African-American</li><li>• English-Dominant Hispanic</li></ul></li><li>• More employed professionals</li><li>• More graduate/Prof degrees</li></ul>

**HOW MUCH AND HOW OFTEN**

How much TV does this group actually watch on mobile devices vs. on a standard television set? Very little, as it turns out (see **Exhibit 6**). Only 7% of all mobile viewers’ total TV watching occasions logged during the journal were done on a smartphone or a tablet. The vast majority is still done on a television set, and more TV watching still happens computers (laptops or desktops) than it does on tablets or smartphones.

**EXHIBIT 6: % of TOTAL TV VIEWING OCCASIONS WATCHED ON EACH DEVICE AMONG MOBILE VIEWERS (GROUP 3)**

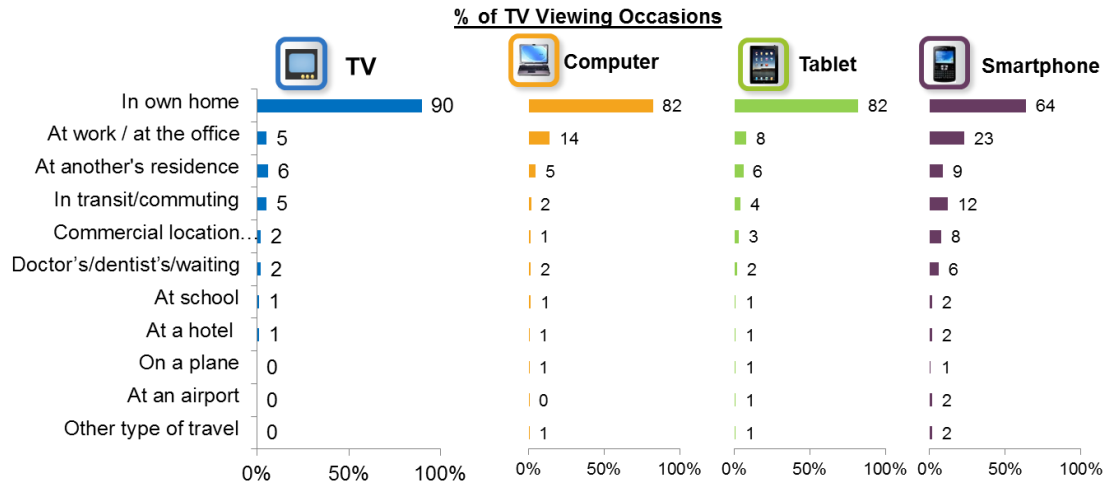


Even though mobile TV viewing is a *frequent* (weekly) occurrence for these viewers, they use mobile devices opportunistically when they happen to be more convenient than watching a particular show on a television set at a particular time.

**MOBILE TV VIEWING OCCASIONS: A PROFILE**

**LOCATION:** Interestingly, a majority of mobile TV viewing happens *inside the home* (see **Exhibit 7**), even on smartphones (64% of all smartphone TV viewing occasions happened inside the home).

# EXHIBIT 7: TV VIEWING LOCATION BY DEVICE TYPE

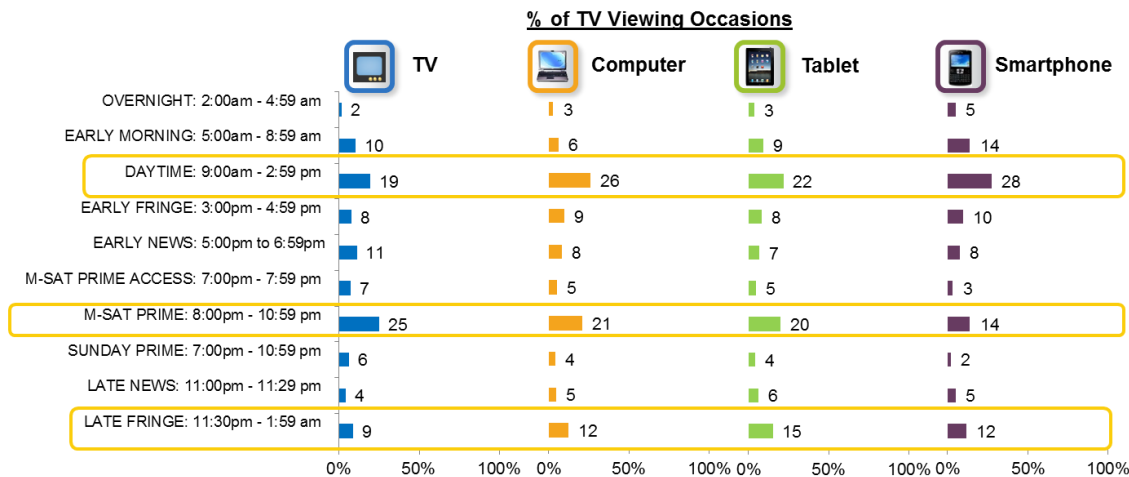


Base: Total positive TV viewing occasions. JOURNAL\_Q17: From which of the following locations did you watch TV on a device other than a traditional TV set during this time? (Select all that apply.)

The next most common location is actually at work. Many people with jobs that involve “down-time” moments will use computers, tablets or smartphones to catch up on certain shows. We also saw participants logging mobile TV viewing at other people’s houses, while commuting, at a commercial location (e.g., a café, etc.), or while waiting for something else (e.g., at a doctor’s office).

**TIME OF DAY:** Much mobile viewing happens during the “daytime” time block (9am-2:59pm)...often times outside the home. There is also lots of mobile TV viewing that happens during “Primetime” (8pm-10:59pm)—typically while people are inside the home (e.g., the “screen multiplier” effect that mobile devices have for multi-person households) as well as during the “late fringe” (11:30pm to 1:59am) (see **Exhibit 8**).

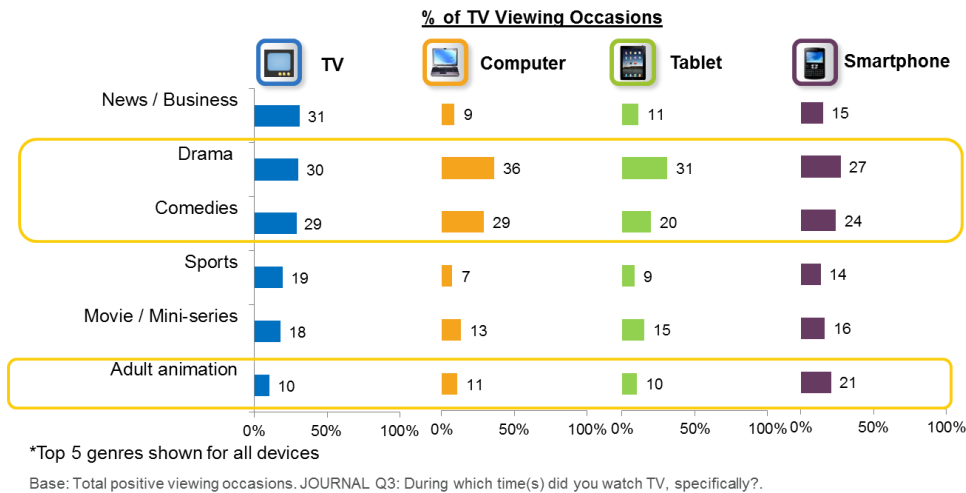
# EXHIBIT 8: TIME OF DAY VIEWING BY DEVICE



Base: Total positive viewing occasions. JOURNAL\_Q3: During which time(s) did you watch TV, specifically?

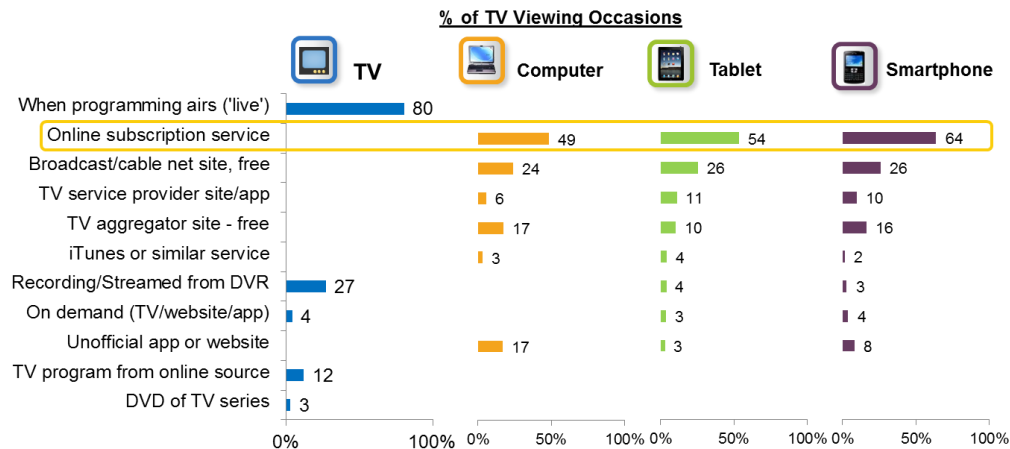
**GENRES:** Genres watched on mobile devices are actually fairly similar to other types of television viewing (see **Exhibit 9**). People often watch dramas and comedies, some movies, some sports. The major *differences* in genres by device type are news/business (people watch *less* of this on mobile devices) and adult animation (people watch *more* of this on smartphones, although this has more to do with smartphone TV watchers being younger, however).

EXHIBIT 9: GENRES WATCHED BY DEVICE



**TV DISTRIBUTION SOURCE:** The most notable difference between mobile TV and television set viewing occasions is the source through which people access shows (see **Exhibit 10**). Mobile TV viewers most commonly get their programming via **online subscription services** (e.g., Netflix, Hulu Plus, etc.), especially on smartphones. People are also accessing TV programming through free (ad-supported) broadcast or cable network sites or apps, free TV aggregator sites or apps, and “TV Everywhere” sites or apps from subscription service providers like XFINITY.

## EXHIBIT 10: TV DISTRIBUTION SOURCE BY DEVICE

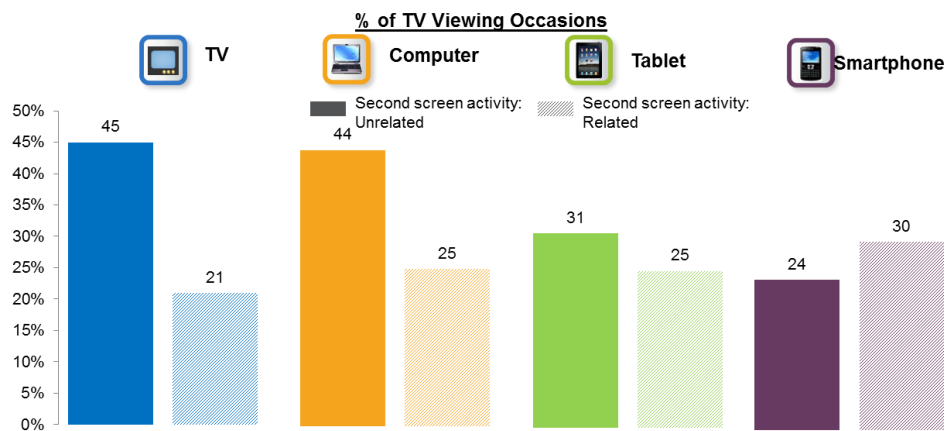


Base: Total positive viewing occasions. JOURNAL Q6/Q8/Q10/Q12/Q14: What was the source of TV shows or movies that you watched on a [DEVICE] during this time? All data is within Group 3.

## SECOND SCREEN ACTIVITY:

We found that viewers much more commonly do **unrelated activities on other devices** when they are watching TV on a television set or a computer. During nearly half the TV viewing occasions logged on either of these devices, viewers reported doing something on a different device (e.g., a tablet or a smartphone) that had nothing to do with the TV programming they were watching (see the solid bars in **Exhibit 11**).

## EXHIBIT 11: SECOND SCREEN ACTIVITY BY DEVICE



Base: Total positive TV viewing occasions. JOURNAL Q19: What activities did you do at the same time on these devices while you were watching TV?

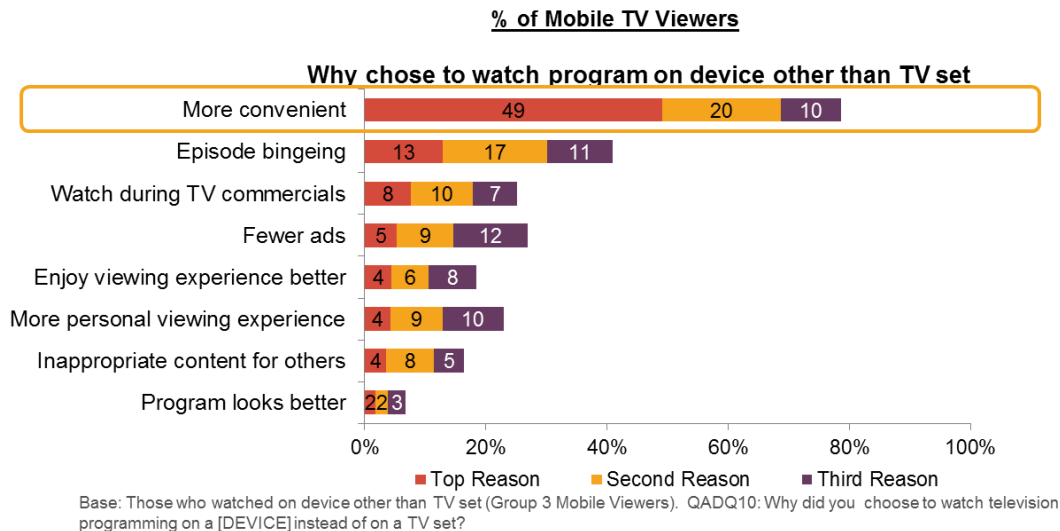
Conversely, viewers were more commonly doing **activities related to the TV shows** they were watching when they were watching them on mobile devices (25% of the tablet TV viewing occasions; 30% of the smartphone TV viewing occasions)...most commonly looking up information about a show, but also including posting on social networks about it, texting or emailing friends. Qualitative research revealed that some of this activity isn't necessarily on a separate *device*—it can also include activity done on a different *app* or browser on the same device. Since most TV watching on mobile devices is of the time-delayed variety, it can easily be paused while people look up information, post on Facebook, tweet, etc., then resumed.

## MOTIVATIONS FOR MOBILE TV VIEWING

By far the most common driver of mobile TV viewing is **convenience** (see **Exhibit 12**). This would include...

- ...the mobile device is the *only* one available to them at a given time to watch a program (e.g., outside the home)
- ...the mobile device is the only way they can watch certain shows or episodes (e.g., they get Netflix streaming of older episodes on their mobile but aren't set up to stream them to their television)
- ...the mobile device enables instant gratification (e.g., being able to watch a show they want immediately even while somebody else is using the television set)

## EXHIBIT 12: TOP MOTIVATORS FOR WATCHING TV ON MOBILE DEVICES



Another common motivator for watching on a mobile device is **bingeing on multiple episodes**. This goes back to the differences in TV distribution sources mentioned earlier. Currently, many believe that online subscription services make it easier to binge on a TV series starting from the pilot.

Interestingly, **ad avoidance is not a major motivator for watching on mobile devices**. Some people mentioned that they'll watch parts of TV shows on their mobile device while TV ads are airing for another show on the television set, and others like that there are sometimes "fewer ads" when they watch on mobile devices. People often watch TV programs through "free" (ad-supported) services like Hulu, or on network apps, and qualitative research confirmed that many consumers are not any more averse to ad-supported TV programming viewed on a mobile device than they would be on a television set.

## IMPACT OF MOBILE TV VIEWING

Mobile TV viewing leads to an increase in overall TV consumption because it makes TV viewing more convenient and accessible during more occasions. We know this both from directly asking respondents in this research as well as running key driver analysis.

We ran the **key driver analysis** using two different techniques, both of which showed a positive relationship between more hours of TV watching on mobile devices with total hours of TV watching logged, even holding constant other likely suspects that are known predictors of total TV consumption (e.g., whether they are an "early adopter" of new TV shows, age, ethnicity, education level, how much time they spend outside the household, etc.).

- The conventional **Ordinary Least Squares (OLS) regression** technique did not give us a very high model fit because our underlying data didn't have a normal distribution, we had a mix of different variable types in the model (e.g., nominal ones like ethnicity, continuous data like # of mobile TV viewing hours watched, etc.), some of the data relationships were not "linear," and we had a multicollinearity issues.



- **TreeNet** modeling, by contrast, gave us a model with extremely good fit and high out-of-sample predictive accuracy. TreeNet is a data mining tool based on Jerome Friedman’s “Stochastic Gradient Boosting” algorithm developed in the machine learning field. It is a hybrid between tree-based CART models and Neural Networks. It worked well on this particular data set because...
  - It does not force you to make any assumptions about your explanatory variables since it is a **non-parametric** approach. Some of the standard assumptions required in linear regression techniques were violated by the explanatory variables we were testing.
  - **Robustness:** TreeNet’s “slow learning” approach enables it to have very high tolerances for dirty and missing data, and let it handle multicollinearity better than other tools.

### IMPACT ON OVERALL TV VIEWING:

Through this process, we found that TV watching on smartphones, in particular, has an additive effect on total TV hours watched across all devices (see **Exhibit 13**). Hours watched on a **computer** (laptop or desktop) had a very similar impact. Tablet TV viewing also had an additive impact on overall TV consumption, but not as strong an impact as TV viewing on smartphones or computers.

### EXHIBIT 13: TOP DRIVERS OF OVERALL TV VIEWING HOURS

Group 3: Regular mobile TV viewers	Importance Rating for total viewing hours <u>on any</u> <u>device</u>	Predictive Impact on total TV viewing hours
Hours of TV watched on a <u>smartphone</u>	100	More hours of TV viewing on a smartphone <i>adds to</i> total TV viewing hours
Hours of TV watched on a <u>computer</u>	97	More hours of TV viewing on a computer <i>adds to</i> total hours of TV viewing
Level of Education	93	High school or College education have more TV viewing hours than those with Grad/Prof degrees
Tech Adopter Status	89	Leading edge adopters and tech laggards have more TV viewing hours than Early/Late Majority
Race/Ethnicity	79	Black/African American have more TV set viewing hours and Asians have fewer TV viewing hours
Hours of TV watched on a <u>tablet</u>	70	More hours of TV viewing on a tablet <i>adds to</i> total TV viewing hours
Age	70	Age 50-64 have more TV viewing hours and age 15-24 have fewer total TV viewing hours
New TV show watcher	60	Early adopters of new TV shows have more total TV viewing hours

Smartphone TV viewing happens outside the home more often than tablet or computer TV viewing does, and smartphone TV viewing is more common in “cord-cutter” or “cord-never” households that have no traditional subscription TV services (e.g., CATV, satellite, telco). In these situations, smartphones are more commonly the *only* way to watch certain shows, even when inside the home.

### IMPACT ON TELEVISION SET VIEWING:

The impact of mobile TV watching on television set viewing is more nebulous. The TreeNet modeling showed a **positive impact of more smartphone TV viewing on television set viewing** (see **Exhibit 14**). Smartphone TV viewing is more often done in discovery mode: e.g., someone will have time to kill while waiting for their flight, browse on their smartphone for new TV series, try one out, and then later watch other episodes of this show on a television set. Smartphones are the most mobile type of device we tested, and they are more commonly used to watch TV outside the home than any other device. They are therefore the least likely to be a *substitute* for watching on a television set.

## EXHIBIT 14: TOP DRIVERS OF TELEVISION SET TV VIEWING HOURS

Group 3: Regular mobile TV viewers	Importance Rating for total viewing hours on a TV Set	Predictive Impact on <u>TV set</u> viewing hours
Hours of TV watched on a <u>computer</u>	100	More hours of TV viewing on a computer results in <i>fewer hours</i> viewing on a TV set
Level of Education	93	High school or College education have more TV set viewing hours than those with Grad/Prof degrees
Tech Adopter Status	88	Leading edge adopters and tech laggards have more TV set viewing hours than Early/Late Majority
Hours of TV watched on a <u>smartphone</u>	84	More hours of TV viewing on a smartphone results in slightly <i>more hours</i> viewing on a TV set
Race/Ethnicity	80	Black/African American have more TV set viewing hours and Asian have fewer TV set viewing hours
Age	75	Age 50-64 have more TV set viewing hours and age 15-24 have fewer TV set viewing hours
Hours of TV watched on a <u>tablet</u>	69	More hours of TV viewing on a tablet results in slightly <i>fewer hours</i> viewing on a TV set
New TV show watcher	65	Early adopters of new TV shows have more TV set viewing hours
Own a DVR	60	Owning a DVR leads to more TV set viewing hours

TreeNet predictive modeling importance scores

TV watching on a **computer** (laptop/desktop), at the other end of the computing device mobility scale, has a *negative* impact on total individual television set hours. Most TV viewing on computers happens inside the home, and it is often used when the household television set is being used by other members for different shows. It is the device type most likely to be a *substitute* for a television set, although it might not impact total *household* television set hours watched. **Tablets**, meanwhile, have an effect in between the extremes of computers and smartphones. The TreeNet model showed a *slightly negative* impact of more tablet viewing on total television set hours logged, but much less of an impact than computer-based TV watching.

### IN SUMMARY

Mobile TV watching will no doubt increase in ubiquity, frequency, and total TV hours logged in coming years. It has become common enough that this study's results give us a look into what to expect in the future, and guidance for how to evolve cross-platform audience measurement systems in response. Currently, some of the most important learnings we know about mobile TV viewing in the US include:

1. **Mobile TV viewing total volume is still small, even though many people now do it.**
2. **Convenience is by far the most common motivation for mobile viewing.**
3. **TV content distribution source is the biggest mobile vs. television set difference.** Content owners will need to evaluate their licensing contracts with 3<sup>rd</sup>-party online subscription services and their own mobile distribution strategies as monetization models evolve and mobile TV viewing grows in volume.
4. **People have content preferences that—for the most part—span different device types.**
5. **Daytime, Prime and Late Fringe are the most common day parts for mobile.**
6. **Mobile viewers are more focused than television set viewers.** Mobile devices are well suited to TV program-related “second screen” activities—even (and especially) if done by toggling back-and-forth between different apps on the same mobile device.