

Study of Mobile Banking & Payments



Third Edition
August 2016

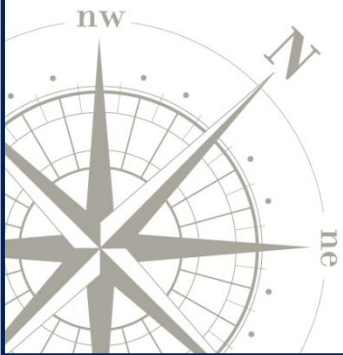


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- 'Pays' Experience

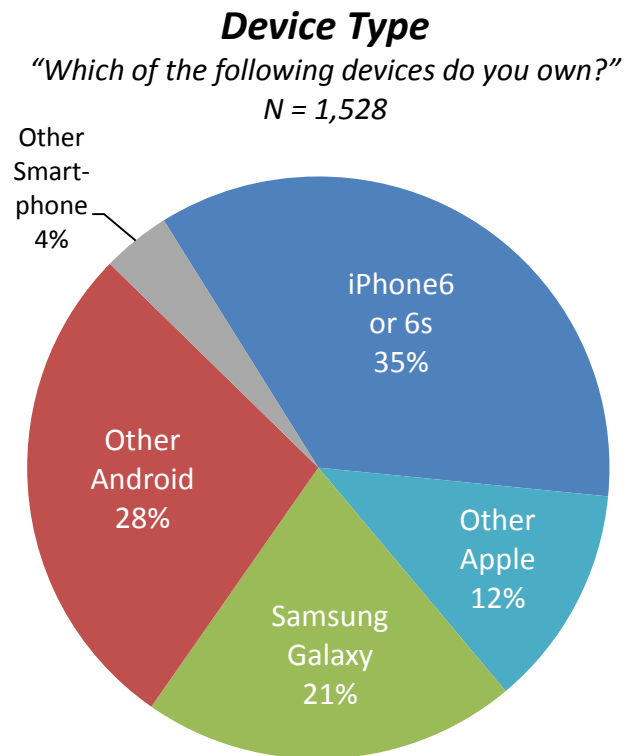
- Mobile Banking

- Survey Sample & Methodology

The third edition of First Annapolis' semi-annual Study of Mobile Banking & Payments tracks consumer adoption and use of the mobile channel for banking and payments.

Study Background

- The online consumer survey was administered in **June 2016** and designed to explore:
 - Consumers' mobile banking and Mobile Payments and attitudes
 - Respondents' ongoing adoption and use of Apple Pay, Android Pay, and Samsung Pay
- Findings are based on a sample of **1,528 U.S. consumers** between the ages of 18 and 54 who meet the following criteria:
 - Own a smart phone
 - Have a checking account or debit card
- Sample demographics are generally in-line with U.S. census distributions; survey results for the overall sample have a margin of error of **+/- 2.5% at a 95% confidence level.***
- Previous studies were conducted in **December 2015** and **May 2015**, and are based on samples of 1,279 and 1,002 respondents, respectively.



82% of respondents have a device that is compatible with Apple Pay, Samsung Pay, and/or Android Pay**.

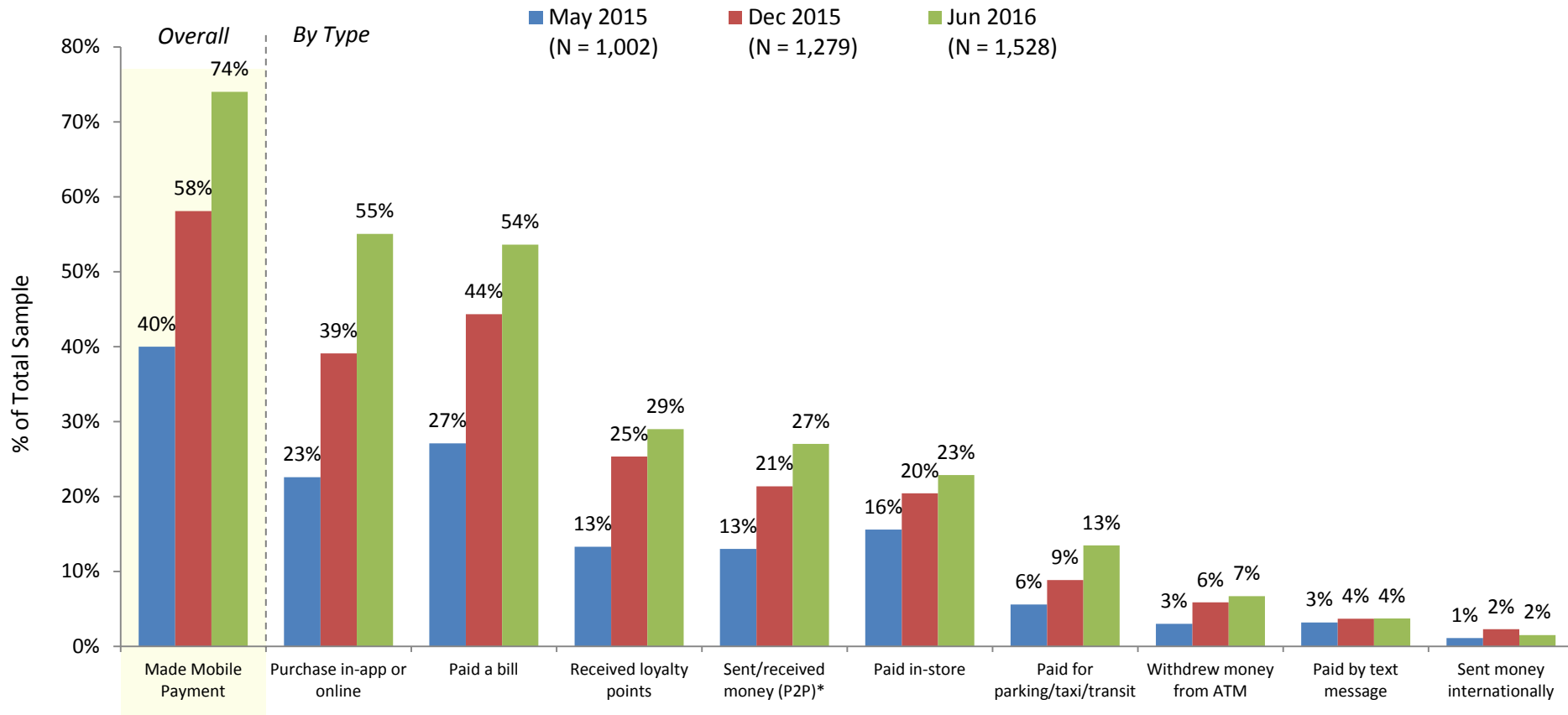
*For a detailed breakdown of the survey sample, please see the Survey Sample & Methodology section.

**52% of Android device owners report having 4.4 KitKat or higher; 7% have an earlier OS; another 41% do not know the operating system version on their phone. Those that do not know are included in the definition of 'compatible'. As such, the compatible device base for Android Pay may be slightly overstated.

Adoption of mobile payments is increasing steadily: **74%** of respondents report having made at least one mobile payment in the last 12 months, up from **40%** in May 2015.

Adoption of Mobile Payments by Type

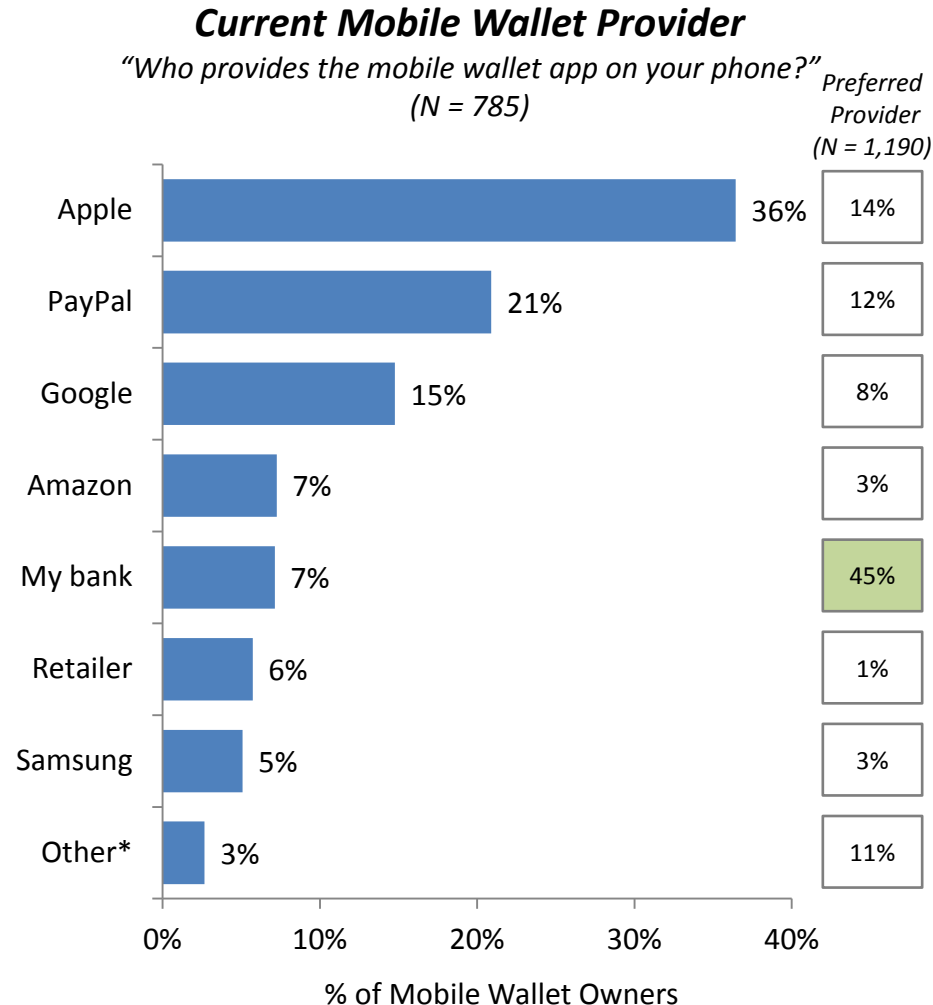
“Which of the following types of payments have you made using your mobile phone within the last 12 months?”



Respondents are most likely to have made online/in-app purchases or paid bills using their mobile device.

More than half of respondents (**51%**) now have a mobile wallet app on their phone—but only **7%** of users report having a mobile wallet through their bank.

- **51%** of respondents reported having a mobile wallet; another **27%** do not currently have a mobile wallet but are interested in the idea.
 - Apple and PayPal are the most frequently cited wallet providers, followed by Google.
 - Banks, however, are consumers’ most preferred provider, as cited by **45%** of respondents (**40%** of current users and **55%** of non-users).
- A mobile wallet can have many features; among the most important to consumers are:
 - Widespread acceptance
 - Coupon/offer functionality
 - Bill payment capabilities
 - Mobile banking integration
 - Ability to store multiple cards



*Includes the newly introduced Microsoft wallet and other third-party providers (e.g., card brand, wireless provider).
First Annapolis Consulting, Inc. | Study of Mobile Banking & Payments (3rd Ed.)

Adoption and use of the Pays is increasing—and satisfaction levels among users are consistently high—but significant runway remains.

Pays by the Numbers

| | Apple Pay | | | Android Pay | Samsung Pay |
|---|---|---|---|---|---|
| | May 2015 | Dec 2015 | Jun 2016 | Jun 2016 | Jun 2016 |
| N = Respondents with Compatible Devices | 398 | 580 | 542 | 707* | 318 |
| % Aware of Pay Service | 88% | 84% | 89% | 64% | 54% |
| % Made a Purchase | 22% | 20% | 31% | 9% | 13% |
| % that Use 1x per Week or More | 4% | 3% | 7% | 2% | 4% |
| | <i>19% of those that have made a purchase</i> | <i>15% of those that have made a purchase</i> | <i>24% of those that have made a purchase</i> | <i>22% of those that have made a purchase</i> | <i>32% of those that have made a purchase</i> |
| Average Cards Loaded/User | 2.5 | 2.1 | 1.9 | 1.9 | 1.5 |
| Avg. User Satisfaction Rating | 4.4 | 4.5 | 4.4 | 4.4 | 4.4 |

*Excludes Android devices with earlier OS versions; includes 174 respondents that reported 'do not know'; as a result, Android Pay awareness/adoption rates for those with 'compatible devices' may be understated

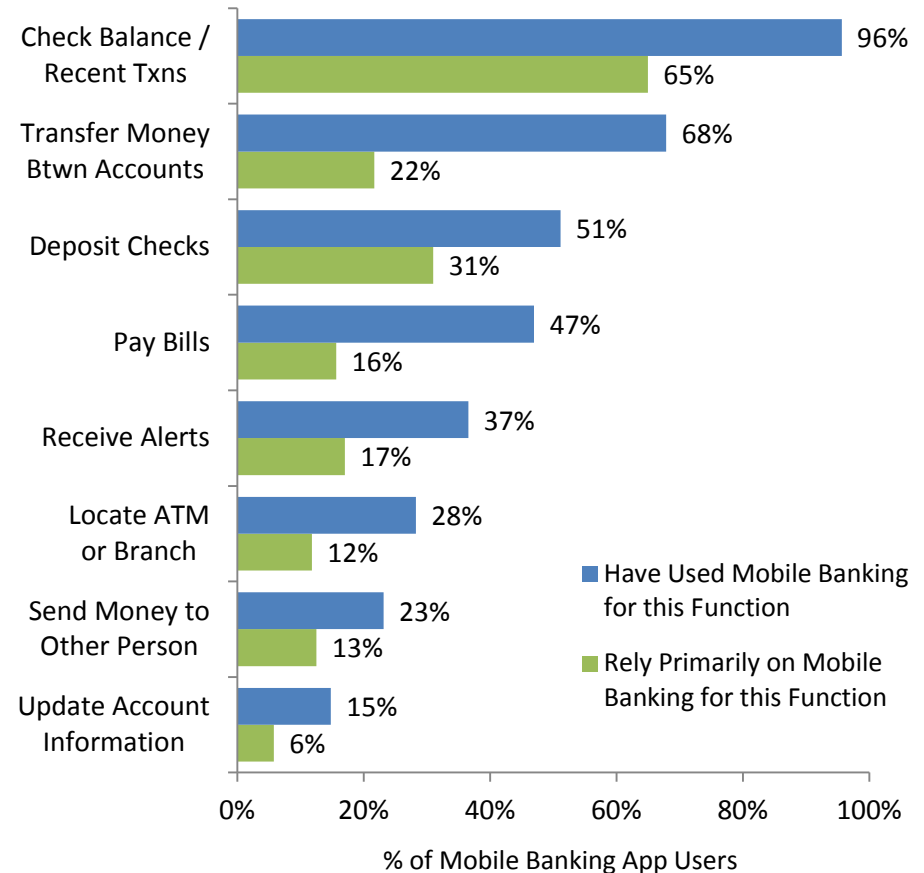
Mobile banking has rapidly established itself as an important customer service channel and critical component of a bank’s distribution strategy.

- **72%** of respondents report using mobile banking, and while mobile banking users skew younger, use is consistently high across age groups.
- Mobile banking users are highly engaged: **47%** say they log in to their bank’s mobile banking app 1-2x a week or more, and **31%** login daily.
- For many users, their mobile device has supplanted online banking and more traditional, physical channels as the primary point of interaction for key servicing functions.
 - **65%** use mobile banking as their primary channel for checking balances and **22%** for transferring funds between accounts.
 - Over half (**51%**) of mobile banking users have used mobile banking to deposit checks, but only **31%** consider mobile bank apps to be their primary channel.
 - Mobile banking users are still more likely to rely on online banking to pay bills and update account information.

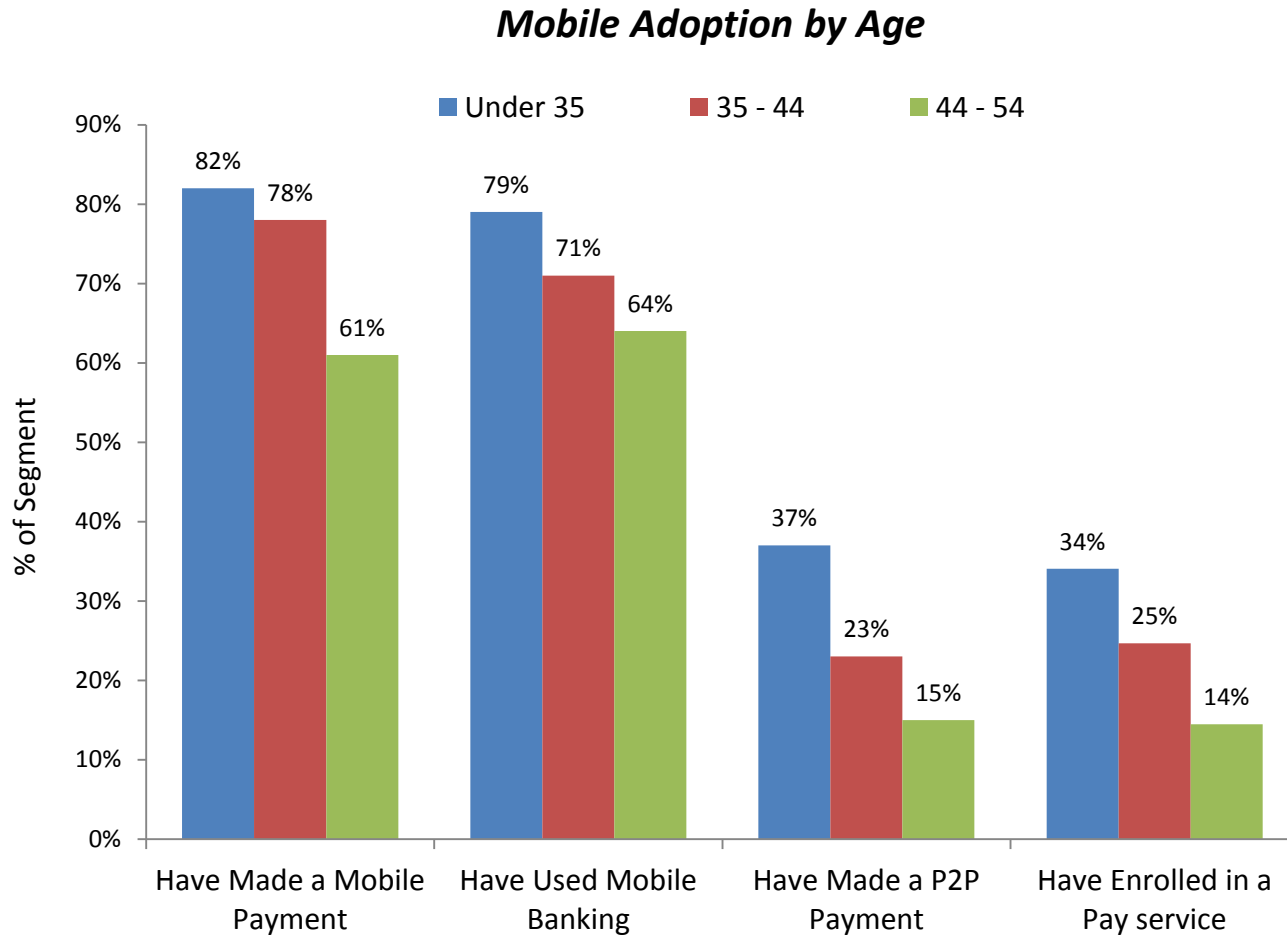
Mobile Banking Functionality

“What types of activities have you performed using your bank’s mobile app within the past twelve months?”

(N = 1,095)



Adoption of mobile is strongest among Millennials, with **82%** of those under 35 having made a mobile payment, and **37%** having made a mobile P2P payment.

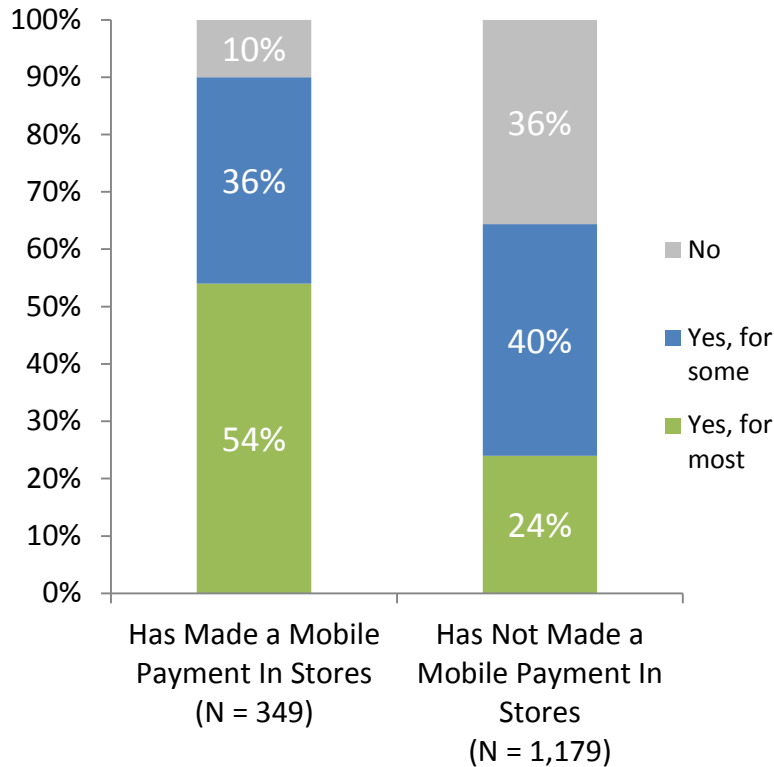


Mobile adoption, however, is not limited to Millennials—penetration and use of mobile banking and payments is becoming common across demographics.

Ubiquitous merchant acceptance would drive increased use of mobile payments (particularly among current users), but would not be enough to motivate many non-users.

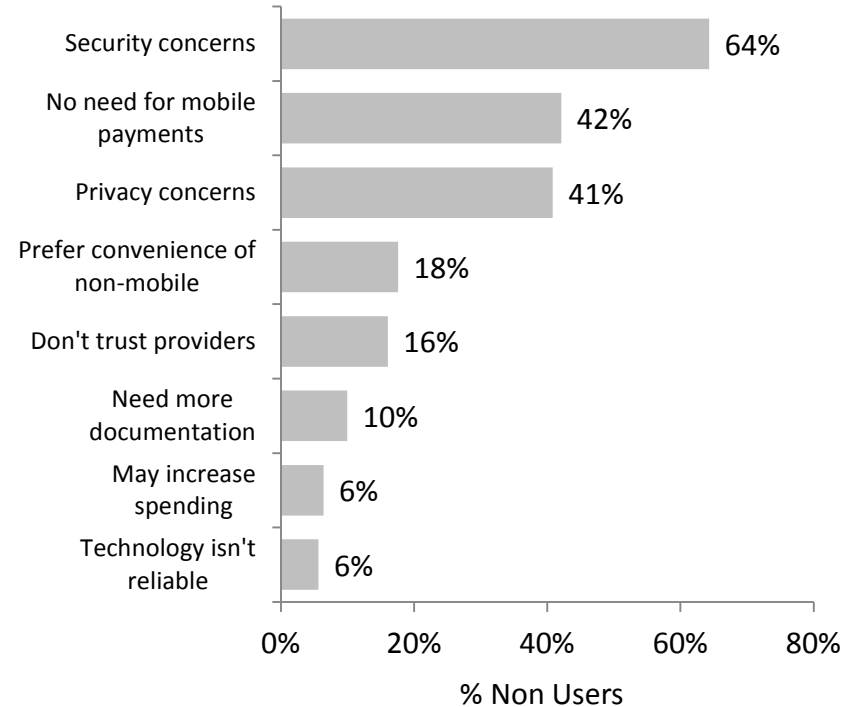
Widespread Acceptance

“If all merchants accepted tap-and-pay mobile payments in their stores, would you be motivated to use a mobile wallet as a primary way to pay?”



Reasons for Not Using Mobile Payments

“Which of the following statement(s) describe your reasons for not using mobile payments?”
(N = 392)



Security and privacy concerns are the primary reasons why individuals do not adopt mobile payments, as well as the perceived lack of need.

Observations (1 of 2)

1. Use of the mobile channel for mobile banking and mobile payments, continues to increase.
 - **75%** of respondents report having made at least one mobile payment in the last 12 months, up from **40%** in May 2015.
 - **72%** of respondents report using mobile banking; **47%** say they log in to their bank's mobile banking app 1-2x a week or more, and **31%** login daily.
2. Adoption of mobile payments is higher among young consumers, but is not limited to Millennials.
 - **82%** of respondents under 35 having made a mobile payment, compared to **64%** of those 45 to 54.
 - **37%** of those under 35 report having made a mobile P2P payment, compared to **15%** of those 45 to 54.

Observations (2 of 2)

3. Banks have an opportunity to play a greater role in mobile payments than they do today.
 - On the wallet front, **51%** of respondents have a mobile wallet; only **7%** of them get their wallet through their bank—although 45% surveyed would prefer to do so.
 - Integration with mobile banking was ranked as a “must have” feature of mobile wallet by many.
4. Adoption and use of the Pays is increasing—and satisfaction levels among users are consistently high—but significant runway remains.
 - **75%** of respondents with compatible devices have not enrolled in a Pay service.
 - **52%** of Pay users are ‘infrequent’ users (one-time users or those who use it less than once per month).
5. Lack of ubiquitous merchant acceptance and security/privacy concerns are significant barriers to adoption/use in the current environment.

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Mobile Payments Highlights

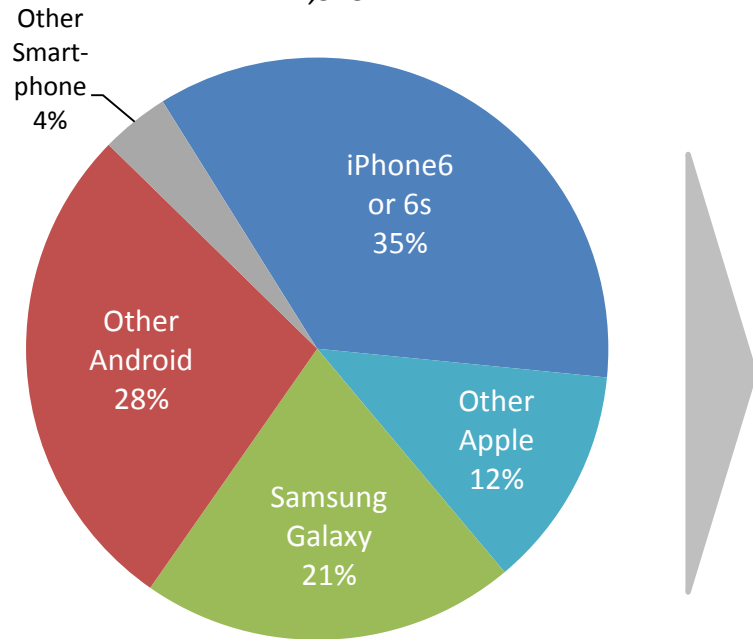
- 82% of respondents own a device that is compatible with Apple Pay, Android Pay, and/or Google Pay.
- Adoption of mobile payments has increased significantly since May 2015: 74% of respondents report having made a payment using their mobile device, up from 58% in December 2015 and 40% in May 2015.
- Online/in-app purchases and bill payment are the most common forms of mobile payments.
- More than one-third of respondents report having made a mobile P2P payment; PayPal and bank transfers were cited most often, although others are gaining traction, and many users report using more than one P2P service.
- Over 50% of respondents report having a mobile wallet.
 - Apple and PayPal are the most common, reported by 36% and 21% of wallet owners, respectively; 7% report having a mobile wallet from their bank.
 - 45% of individuals using or interested in mobile wallets would prefer their mobile wallet to be provided by their bank.
 - The most attractive features of a mobile wallet are widespread acceptance, discounts, bill payment functionality, and integration with mobile banking.
- Lack of merchant acceptance is a barrier to adoption; non-users also cite security and privacy concerns as the most common reason for not using mobile payments.

Device ownership among respondents is similar to market estimates*, with Apple and Android devices dominating the sample.

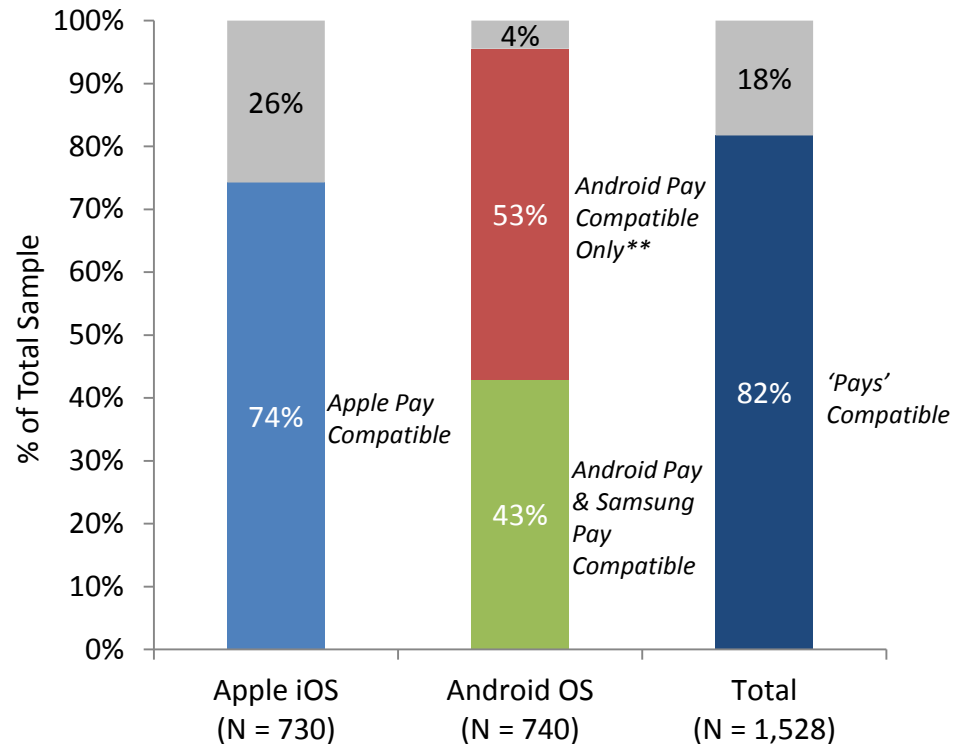
Device Type

“Which of the following devices do you own?”

N = 1,528



‘Pays’ Compatibility by Device Type**



52% of Android users report having a 4.4 Kit Kat operating system or higher; 7% have an earlier OS; 41% did not know their OS version.

82% of respondents have a device that is compatible with one or more of the Pays.

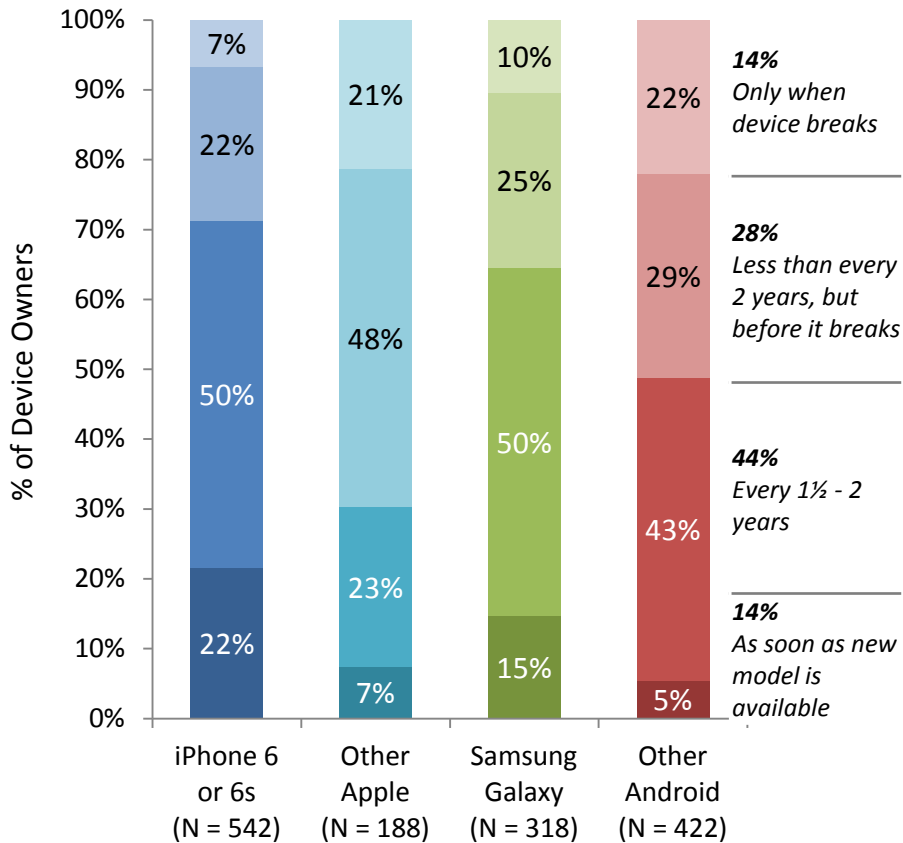
*Estimated device market share as of February 2016: 44% Apple, 53% Android (28% Samsung/25% other Android), and 3% other (source: Comscore). Other smartphone devices include Microsoft phones, Blackberries, and other smartphones.

**Android device holders that do not know their OS version are included in the definition of ‘compatible’. As such, the compatible device base for Android Pay may be slightly overstated.

Most consumers upgrade their device every 1.5 to 2 years; iPhone 6 and Samsung Galaxy users are most likely to report upgrading their device as soon as a new model is available.

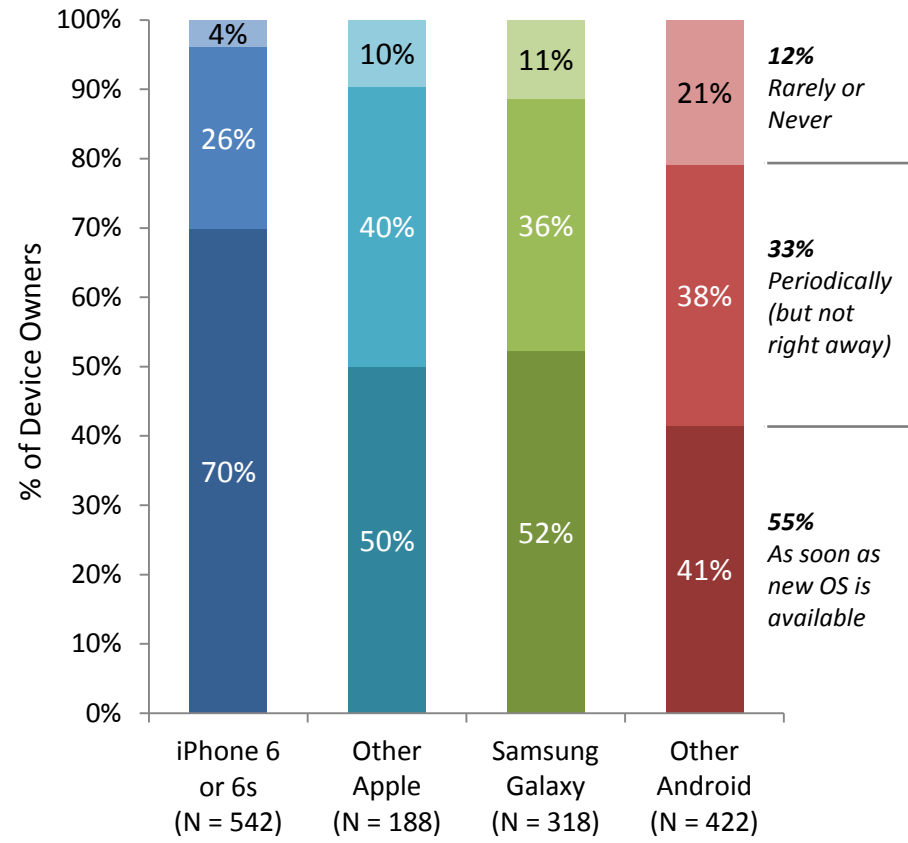
Device Upgrade Frequency

“How often do you upgrade your mobile device?”



Operating System Upgrade Frequency

“How often do you upgrade your device’s operating system?”

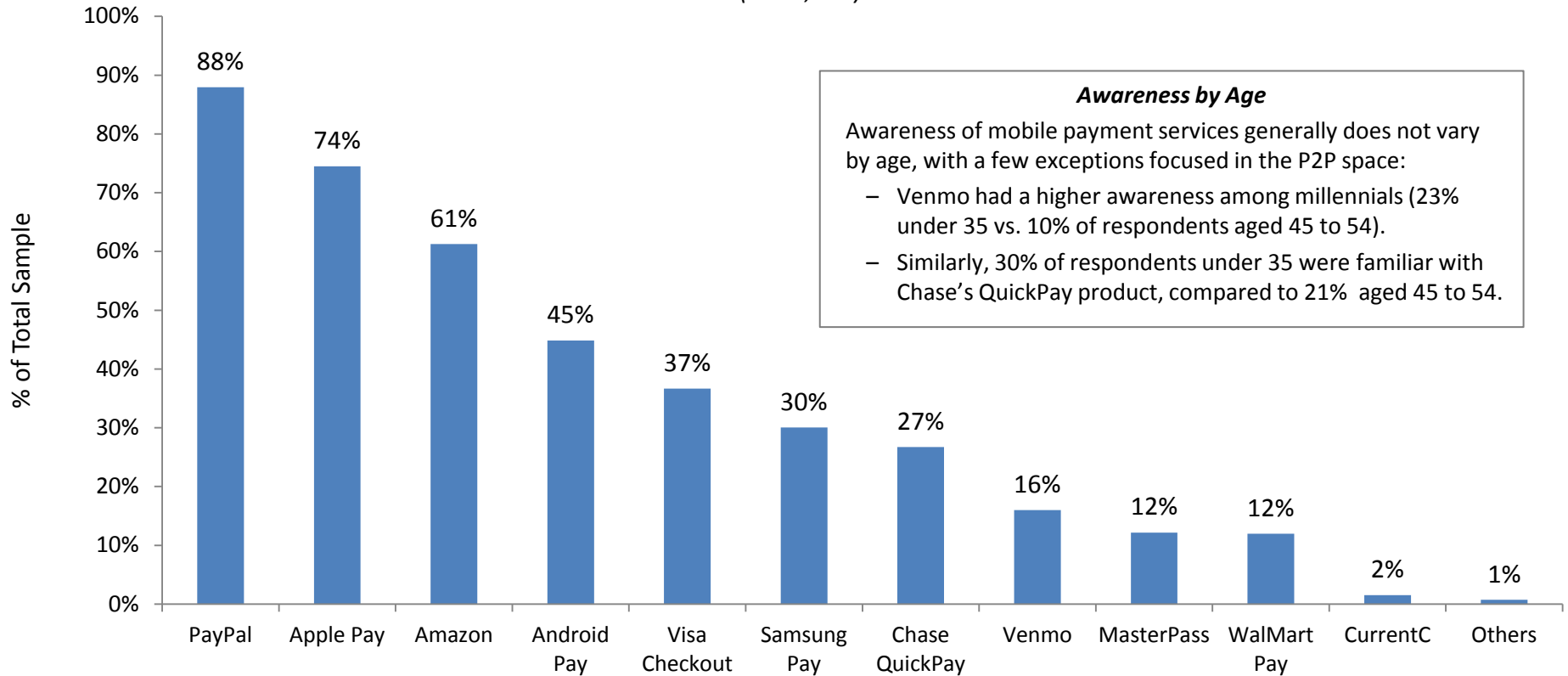


Over half of respondents say that they upgrade their operating systems as soon as new versions are released.

Mobile payments are increasingly common, and consumer awareness of the major mobile payment services is high.

Mobile Payments Awareness

“Which of the following mobile payment applications/services have you heard of?”
(N = 1,528)

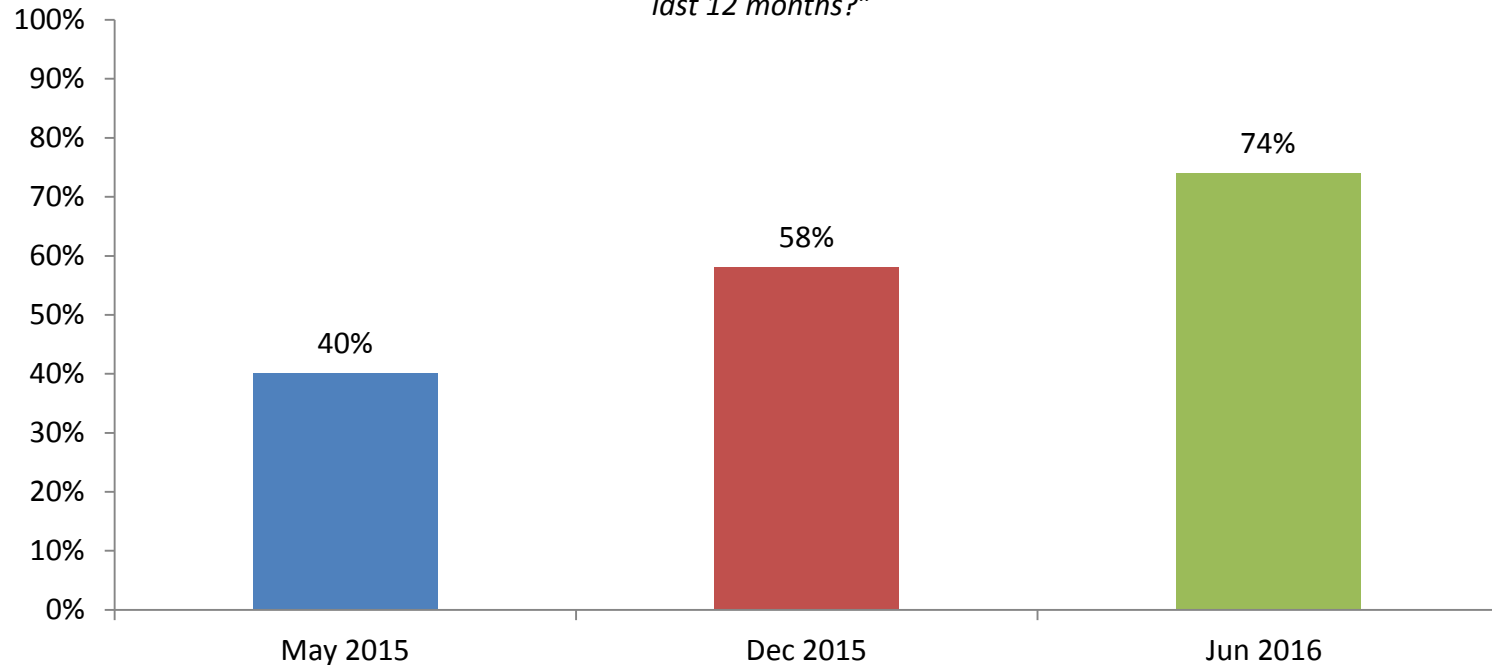


Apple Pay is the most well-known of the ‘Pay’ services, although we expect consumer awareness of WalMart Pay to increase significantly.

Adoption of mobile payments is increasing: 74% of respondents report having made at least one mobile payment in the last 12 months, up from 40% in May 2015.

Mobile Payments Usage

“Have you made a payment using your mobile device any time within the last 12 months?”



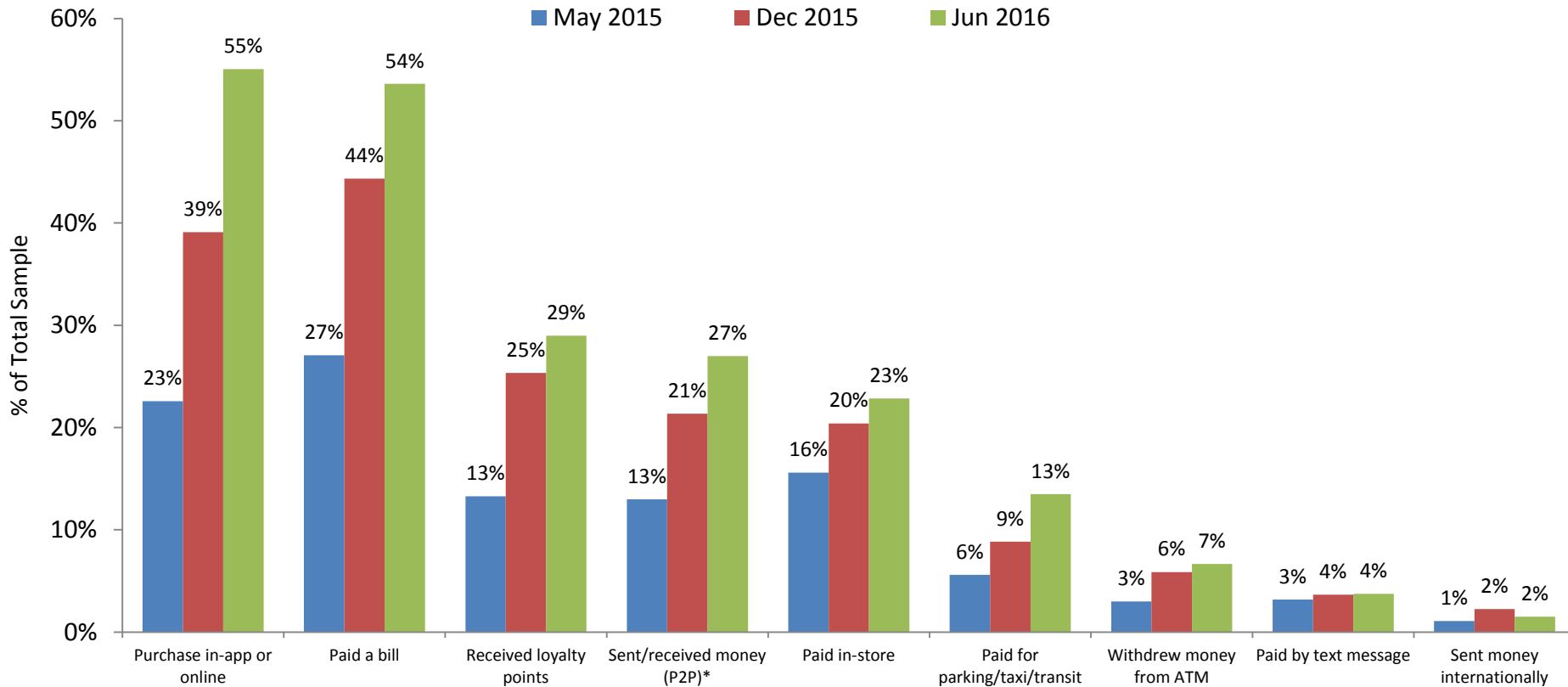
| Age Group | May 2015 | Dec 2015 | Jun 2016 |
|-----------|----------|----------|----------|
| Under 35 | 48% | 67% | 82% |
| 35 – 44 | 36% | 55% | 78% |
| 45 – 54 | 32% | 45% | 61% |

Adoption has increased rapidly in all age demographics, with use among the 35-44 age group doubling and approaching that of the millennials.

In-app/online purchases and bill payment are the most common types of payments made using a mobile device.

Adoption of Mobile Payments by Type

“Which of the following types of payments have you made using your mobile phone within the last 12 months?”

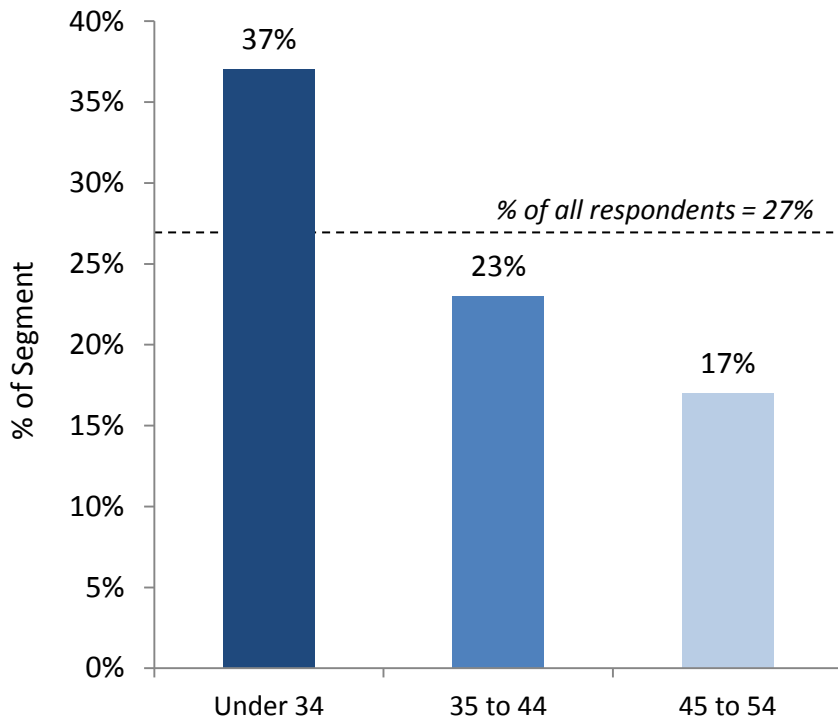


All flavors of mobile payments are showing increases in adoption over time.

Respondents under 35 are most likely to have sent and/or received a mobile P2P payment, although 1 in 5 consumers over 35 report using mobile P2P.

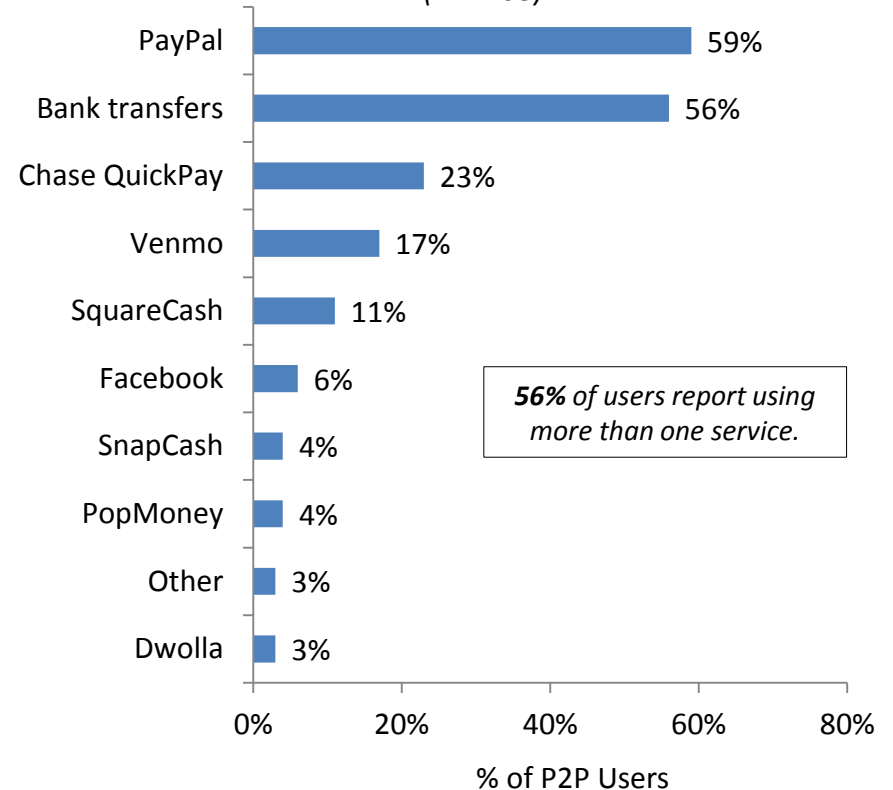
P2P Usage by Age

“Which of the following types of payments have you made using your mobile phone within the last 12 months?”
Send and/or Receive Money to Other People



P2P Payment Application Usage

“Which payment service(s) have you used to send or receive money from other people?”
 (N = 408)



PayPal and bank transfers are the most common P2P services used; many respondents use more than one service.

Adoption of online/in-app mobile payments is most common for online retail, food and beverage, and entertainment apps.

Mobile Payments By App Type

“Have you made purchases or payments within any of the types of mobile apps listed below?”

(N = 841)



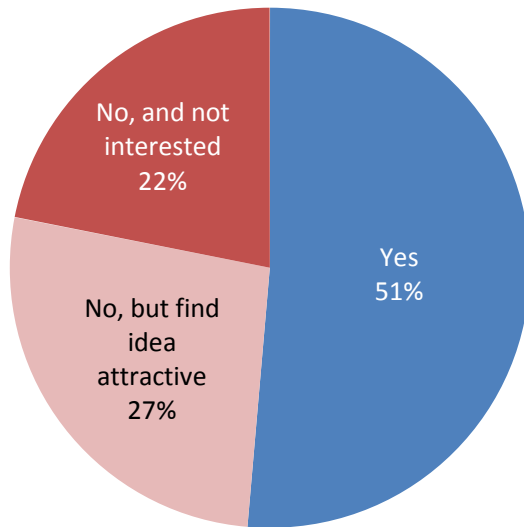
Approximately **48%** of total respondents reported having loaded and stored payment information within a mobile application.

| % of Total (N = 1,528) | 29% | 17% | 14% | 13% | 12% | 10% | 10% | 6% | 5% | 5% | 3% | 2% |
|------------------------|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|
| | | | | | | | | | | | | |

Over 50% of respondents report having a mobile wallet app on their phone.

Mobile Wallet Adoption

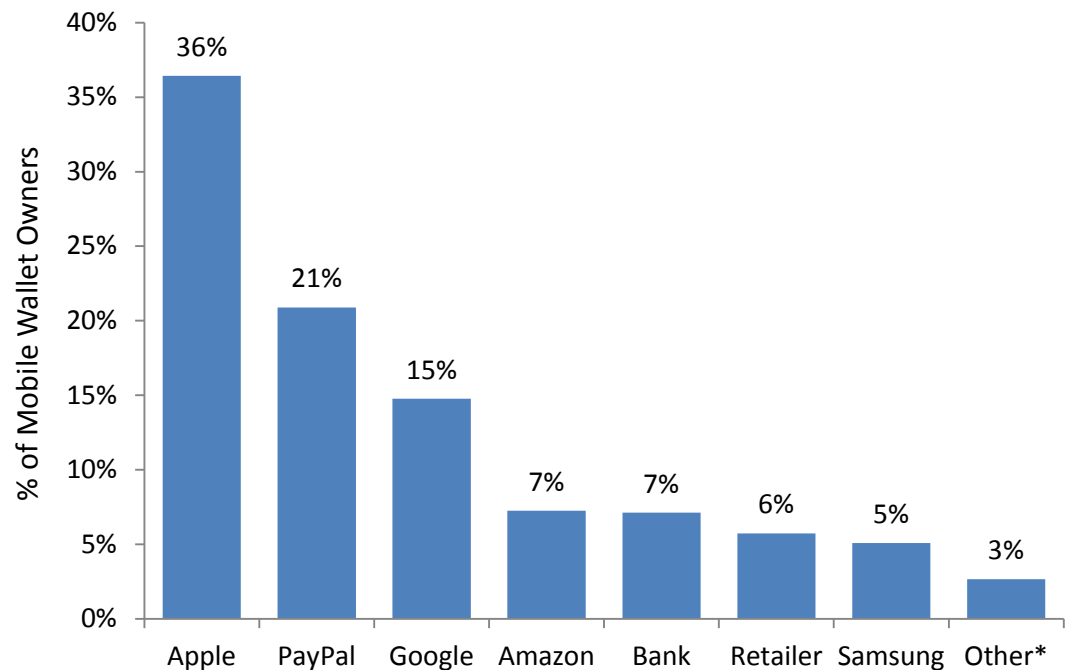
“Do you currently have a mobile wallet app on your phone?”
(N = 1,528)



A mobile wallet was defined as mobile application that stores payment cards, tickets, loyalty cards, receipts, vouchers and other items that might be found in a conventional wallet. A mobile wallet may or may not enable you to make payments in-store or in-app using these stored cards.

Current Mobile Wallet Provider

“Who provides the mobile wallet app on your phone?”
(N = 785)

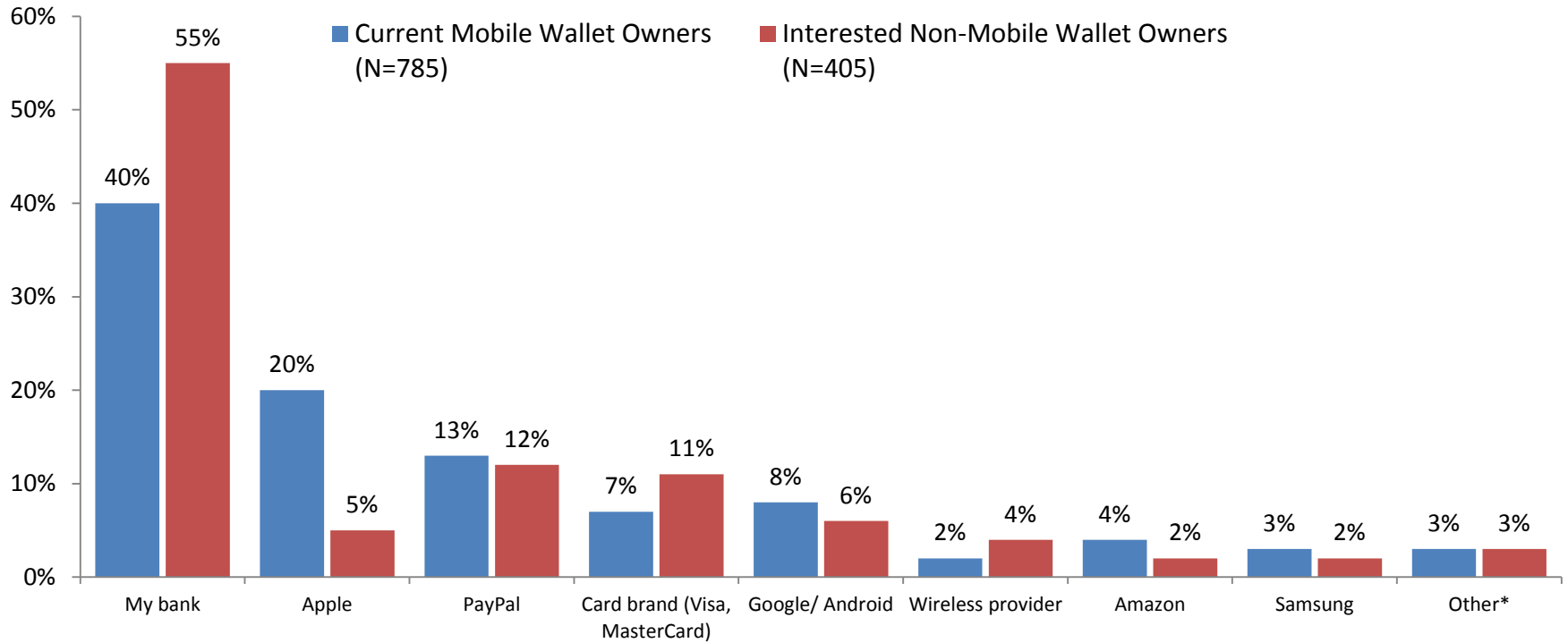


Further analysis of Apple Pay, Android Pay and Samsung Pay usage is discussed in the next section.

While most mobile wallet owners currently have an Apple Pay, PayPal, or Android Pay Wallet, 45% would prefer an offering from their bank.

Preferred Wallet Provider

“Who would be your preferred provider of a mobile wallet app?”



| | | | | | | | | | |
|----------------------------|-----|-----|-----|----|----|----|----|----|----|
| % Total Respondents | 45% | 14% | 12% | 9% | 8% | 3% | 3% | 3% | 3% |
|----------------------------|-----|-----|-----|----|----|----|----|----|----|

Over half of interested mobile wallet non-users would prefer a mobile wallet offering from their bank over the “Pays” and other third party providers.

*Includes retailers and other third parties.

Widespread acceptance is the most desired feature in a mobile wallet, followed by coupons/offers; integration with mobile banking is also “must have.”

Desired Mobile Wallet Features*

(N = 1,528)

| Feature | Avg. | % Responded: |
|----------------------------------|------|--------------|
| <i>Must Have</i> | | |
| Widespread acceptance | 3.5 | 45% |
| Coupon/offer functionality | 3.3 | 34% |
| Ability to pay bills | 3.3 | 37% |
| Integration with mobile banking | 3.1 | 31% |
| Ability to store multiple cards | 3.1 | 31% |
| <i>Must Have</i> | | |
| Integration of receipts | 3.1 | 27% |
| One-click checkout | 3.0 | 27% |
| Access to shopping tools | 3.0 | 23% |
| Ability to purchase tickets | 2.9 | 22% |
| Order ahead with in-store pickup | 2.9 | 18% |
| <i>Not Important</i> | | |
| P2P | 2.6 | 39% |
| Social network integration | 2.0 | 62% |

“Must Have”

“Nice to Have”

“Not Important”

Commentary

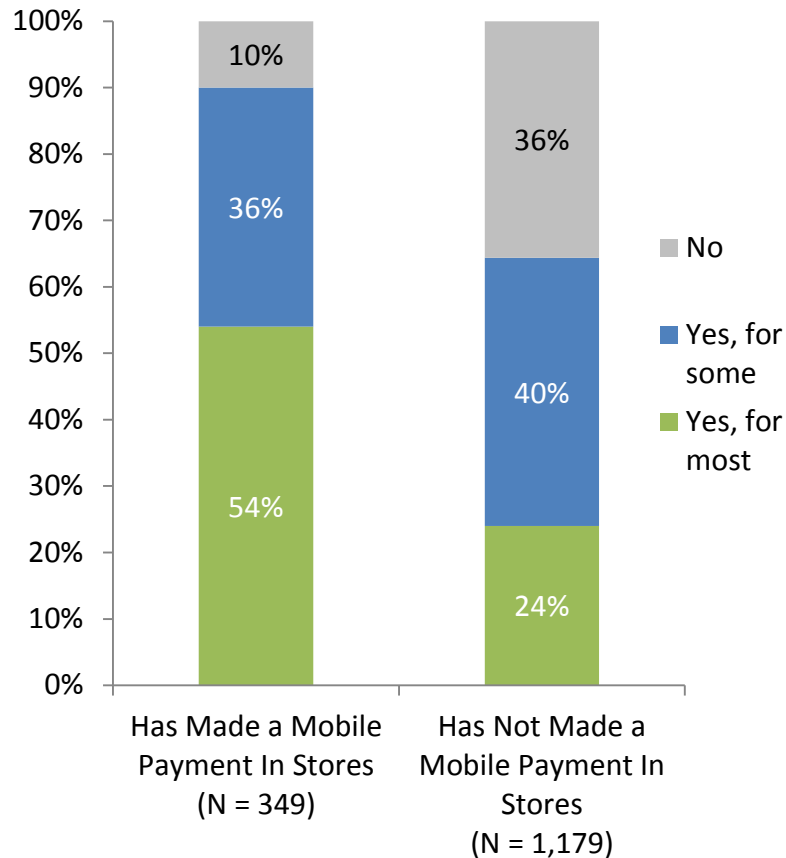
1. The recent introduction of proprietary financial institution wallets (e.g., the Wells Fargo Wallet), along with the launches of major retailer initiatives (e.g., WalMart Pay), represent the next step in the evolution of mobile payments—and may go a long way to delivering the desired functionality.
2. Many of the features promoted by Wells Fargo, including a single, integrated banking application, card controls and instant provisioning, provide an advantage to FI wallets over non-FI wallets.
3. We expect other leading financial institutions to offer similar proprietary products to retain “top of wallet” status and remain relevant to tech savvy customers.

*Respondents were asked to categorize listed features as “must have,” “nice to have” or “not important” in a mobile wallet. These designations were assigned point values of 5, 3 and 1, respectively, and an average score was calculated for each response. Features categorized as “Must Have” have an average rating of 3 or higher and more than 30% of respondents must have indicated it as a “must have” feature.

Ubiquitous merchant acceptance would drive increased use of mobile payments (particularly among current users), but would not be enough to motivate many non-users.

Widespread Acceptance

“If all merchants accepted tap-and-pay mobile payments in their stores, would you be motivated to use a mobile wallet as a primary way to pay?”

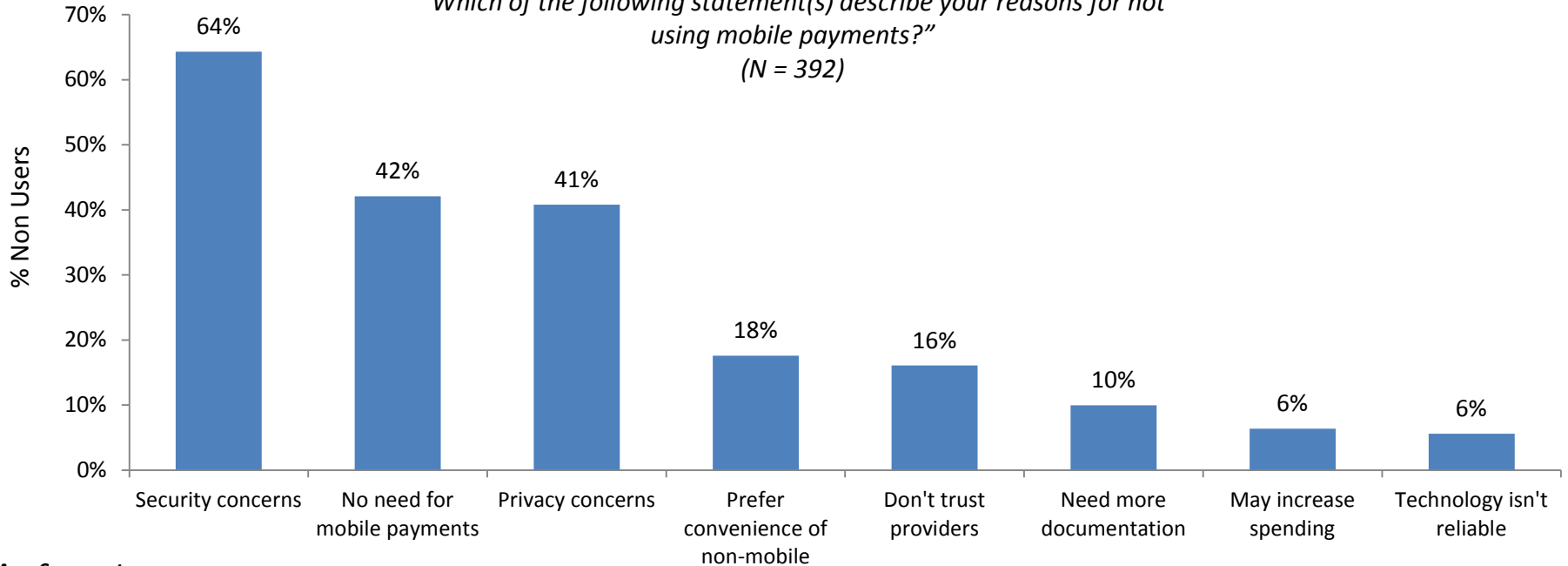


Commentary

- Several of the largest merchants, including Walmart and CVS, initially disabled specific types of wallet acceptance (i.e., NFC) at the point of sale (POS).
- However, since the announcement of Apple Pay and Android Pay, mobile wallet acceptance has been a slow, but steady climb.
 - Apple Pay is now accepted at over 2MM locations, up from ~220,000 locations at its launch.
 - New merchants that accept or will soon accept NFC include Best Buy, Rite Aid, Dunkin' Donuts, Kohl's, Crate & Barrel, Chick-fil-A, and Au Bon Pain.
- While NFC appears to be gaining traction among the Pays, merchants may choose different technology (e.g., QR codes for Starbucks and Walmart Pay), causing other merchants to wait to make changes to their POS systems, further delaying widespread acceptance.

Security and privacy concerns are the primary reasons individuals do not adopt mobile payments, as well as the perceived lack of need.

Reasons for Not Using Mobile Payments
 “Which of the following statement(s) describe your reasons for not using mobile payments?”
 (N = 392)



Age Segments

| Age Segment | Security concerns | No need for mobile payments | Privacy concerns | Prefer convenience of non-mobile | Don't trust providers | Need more documentation | May increase spending | Technology isn't reliable |
|-------------|-------------------|-----------------------------|------------------|----------------------------------|-----------------------|-------------------------|-----------------------|---------------------------|
| Under 35 | 65% | 41% | 37% | 29% | 14% | 10% | 10% | 6% |
| 35 – 44 | 61% | 38% | 39% | 12% | 12% | 7% | 5% | 2% |
| 45 – 54 | 65% | 45% | 44% | 14% | 19% | 11% | 5% | 7% |

Concerns about security are consistent across age groups; older consumers are more likely to have concerns about privacy and lack of trust.

Observations & Implications

1. As a result of both consumer-initiated upgrades and natural contract expiration cycles, the sophistication of devices in the market—and therefore the availability of NFC-based payment services—is increasing.
2. Most consumers have experience using mobile payments: three quarters of respondents have made a purchase/payment using their device in the last year.
 - Online behaviors (shopping, paying bills) are tipping over into the mobile channel.
 - “New” categories in mobile payments (P2P, in-store payments, taxi/transit) are gaining traction.
3. Banks have an opportunity to play a greater role in mobile payments than they do today.
 - On the P2P front, non-bank providers of P2P services are gaining traction, particularly among younger consumers.
 - On the wallet front, 51% of respondents have a mobile wallet; only 7% of them get their wallet through their bank—although 45% surveyed would prefer to do so.
4. Lack of ubiquitous merchant acceptance and security/privacy concerns are significant barriers to adoption/use in the current environment; banks and other industry stakeholders will need to collaborate to address both.

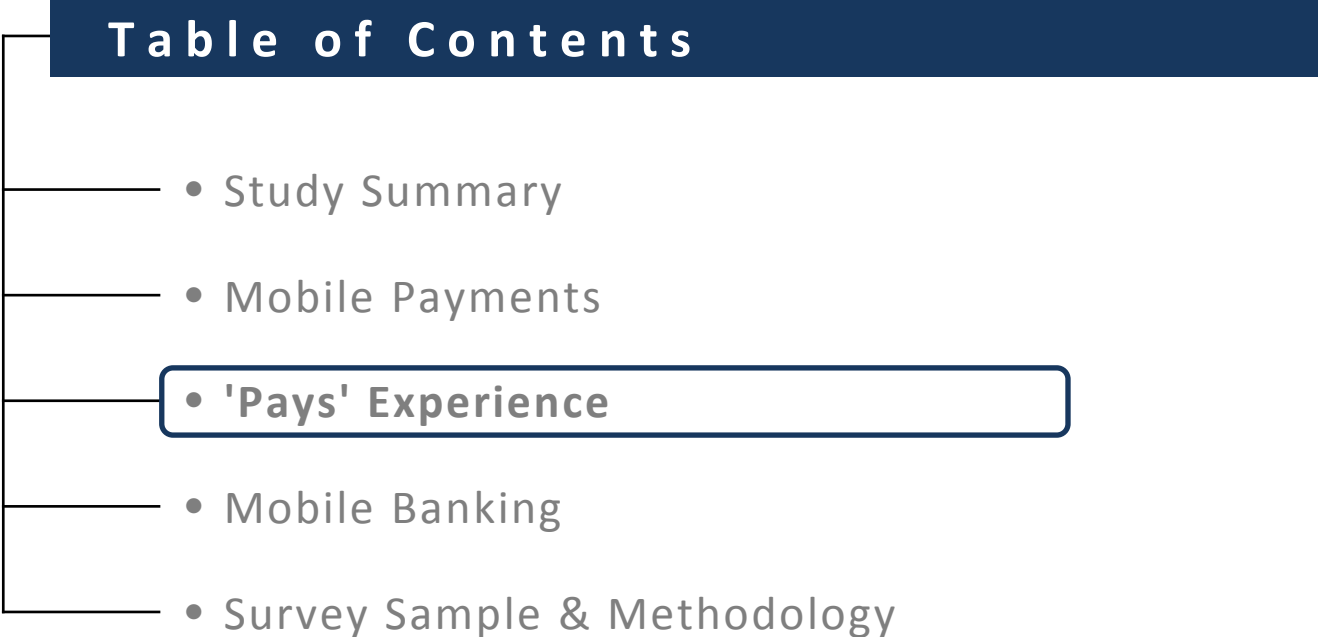
A diagram showing a table of contents. A dark blue horizontal bar at the top contains the text "Table of Contents" in white. A vertical line descends from the left side of this bar and branches into five horizontal lines, each pointing to a list item. The list items are: "• Study Summary", "• Mobile Payments", "• 'Pays' Experience", "• Mobile Banking", and "• Survey Sample & Methodology". The item "• 'Pays' Experience" is highlighted with a dark blue rounded rectangular box.

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- **'Pays' Experience**
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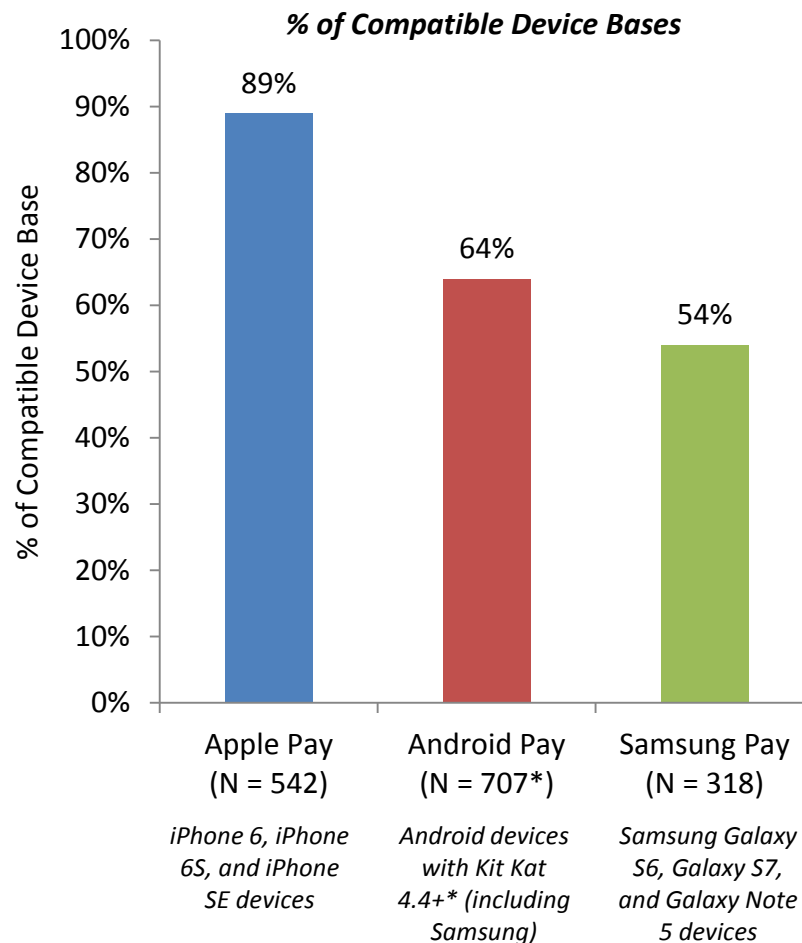
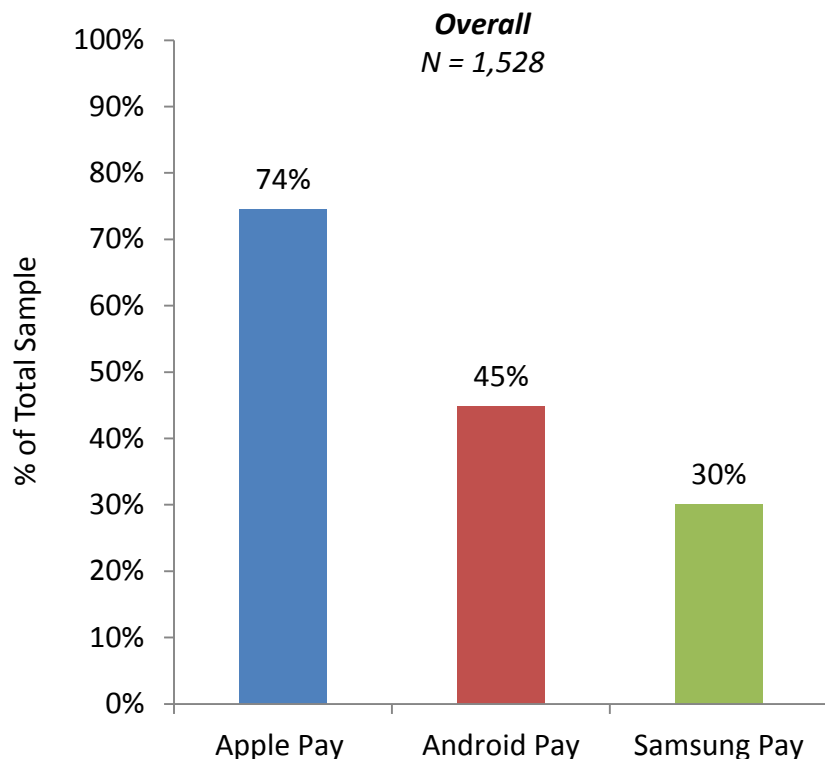
'Pays' Experience Highlights

- 74% are aware of Apple Pay; less than half are aware of Android Pay (45%) and Samsung Pay (30%).
- 42% of iPhone 6/6S/SE owners have enrolled in Apple Pay; enrollment rates for respondents with compatible devices are 14% and 18% for Android Pay and Samsung Pay, respectively.
- Pay users have added an average of 1.9 cards into their wallet (50% have loaded more than one); credit cards are the most frequently loaded.
- Initial trial of the Pays is high (71% of those who enrolled), although only 25% of Pay users report using the service regularly (once a week or more).
- Most users have used their Pay service in stores, although in-app use is also common; expansion into new venues (e.g., ATM , online) will further diversify usage.
- Satisfaction levels are high, and most users reported no issues using the Pay services; the most frequently cited issues were lack of acceptance and terminals not working properly.
- The percentage of iPhone 6 users that have used Apple Pay has increased from 22% to 31% since May 2015, and the percentage that uses it regularly has nearly doubled.
- Comparison to December 2015 data suggests that repeat usage/usage frequency for both Android Pay and Samsung Pay have also increased significantly.

Awareness of Apple Pay—backed by Apple’s prominent brand and marketing—continues to exceed that of Android Pay and Samsung Pay, even among their compatible user bases.

Awareness

“Which of the following mobile payment applications/services have you heard of?”

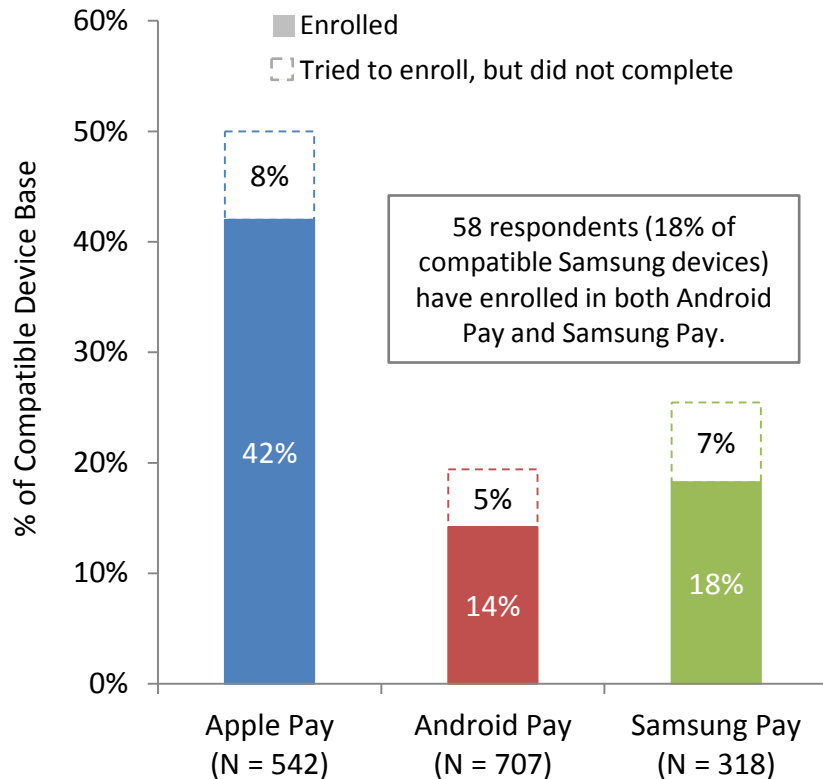


*Excludes Android devices with earlier OS versions; includes 174 respondents that reported 'do not know'; as a result, Android Pay awareness/adoption rates for those with 'compatible devices' may be understated.

With an 11-month head start, Apple Pay has gained greater traction than Android Pay and Samsung Pay: 42% of its compatible user base is enrolled, compared to <20% for the others.

Adoption

"Have you enrolled in Apple Pay/Android Pay/Samsung Pay?"



An additional 5% to 8% of respondents with compatible devices have attempted to enroll in one of the Pays, but did not complete the process.

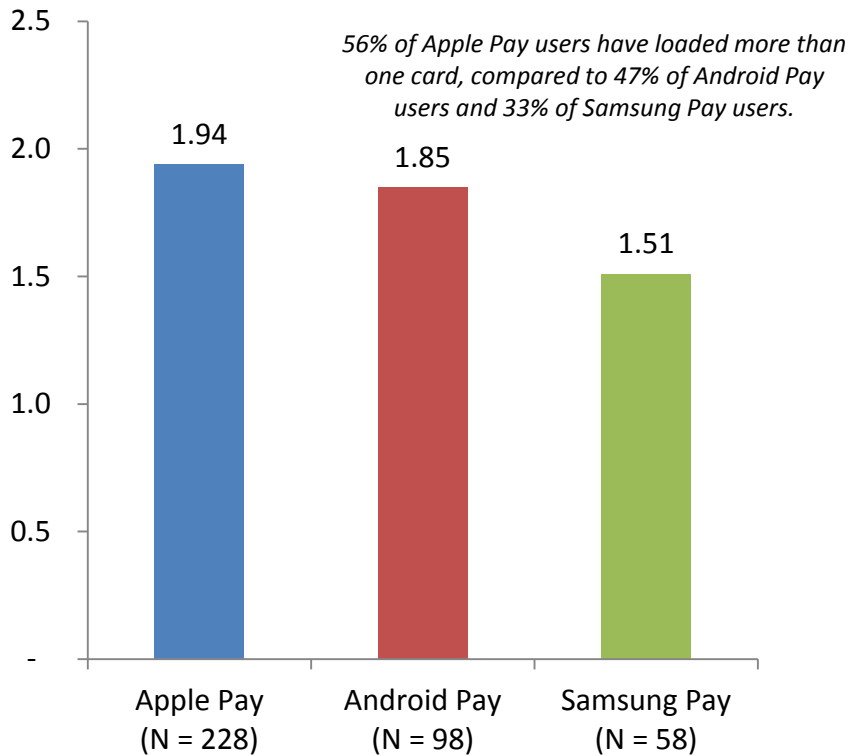
Enrollment Challenges

- Most users (73%) reported no issues or challenges with the enrollment process for any of the services.
 - 8% indicated that the process took too long/had too many steps.
 - 8% experienced trouble loading a card.
 - Issues were more common among Android Pay/Samsung Pay users than Apple Pay users.
- Among those that did not complete the process, 40% had no issues. Of the remaining 60%:
 - 65% said the process took too long/had too many steps, and 53% were ultimately unable to load a card.
 - Many also cited security concerns during the enrollment process, particularly for Android Pay.

Apple Pay and Android Pay users have loaded an average of 1.9 cards into their wallet, while Samsung Pay users average 1.5.

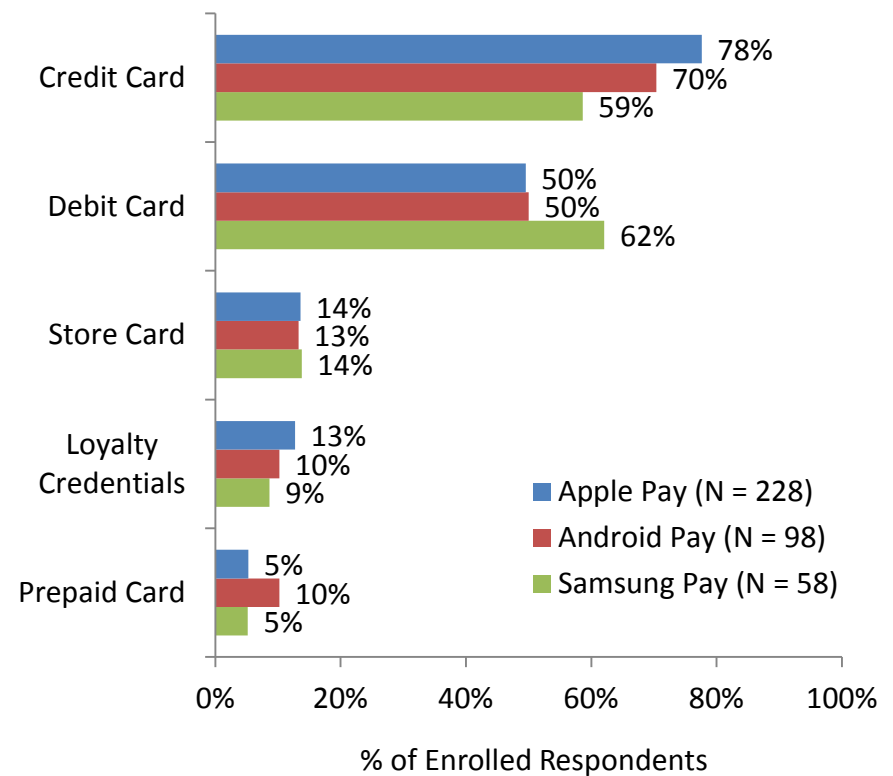
Average Cards Loaded

“How many different cards have you loaded into Apple Pay/Android Pay/Samsung Pay?”



Types of Cards Loaded

“Which types of card(s) have you loaded into Apple Pay/Android Pay/Samsung Pay?”

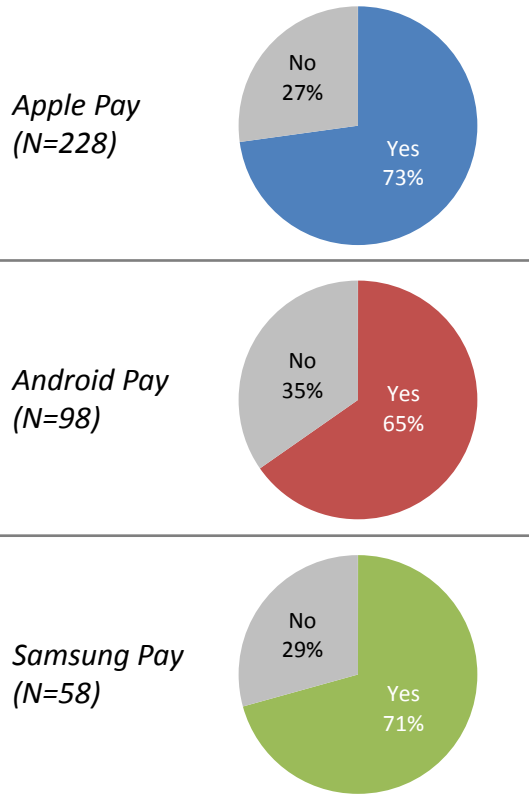


Credit cards are the most frequently loaded card type, followed by debit cards.

Initial trial rates are high: 71% of those who enrolled in one of the Pays have made a purchase, and most have used it more than once.

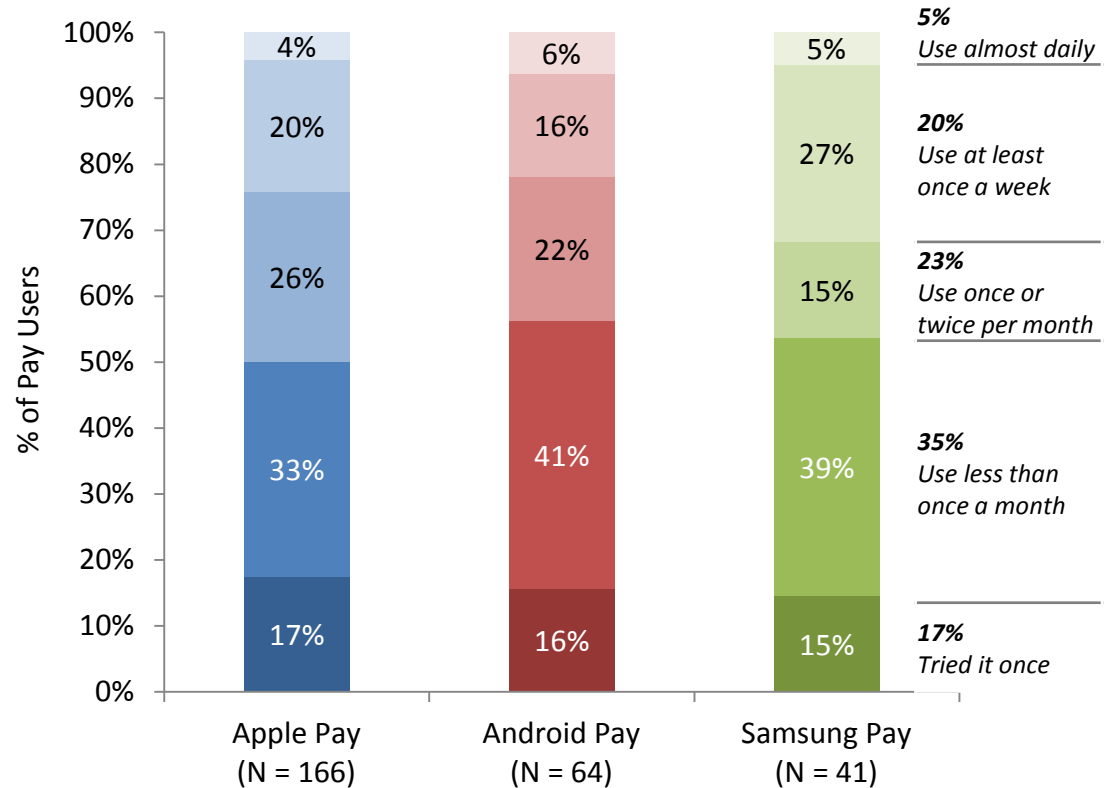
Purchase Experience

“Have you used Apple Pay/Android Pay/Samsung Pay to make a purchase?”



Frequency of Use

“How often do you use Apple Pay/Android Pay/Samsung Pay?”

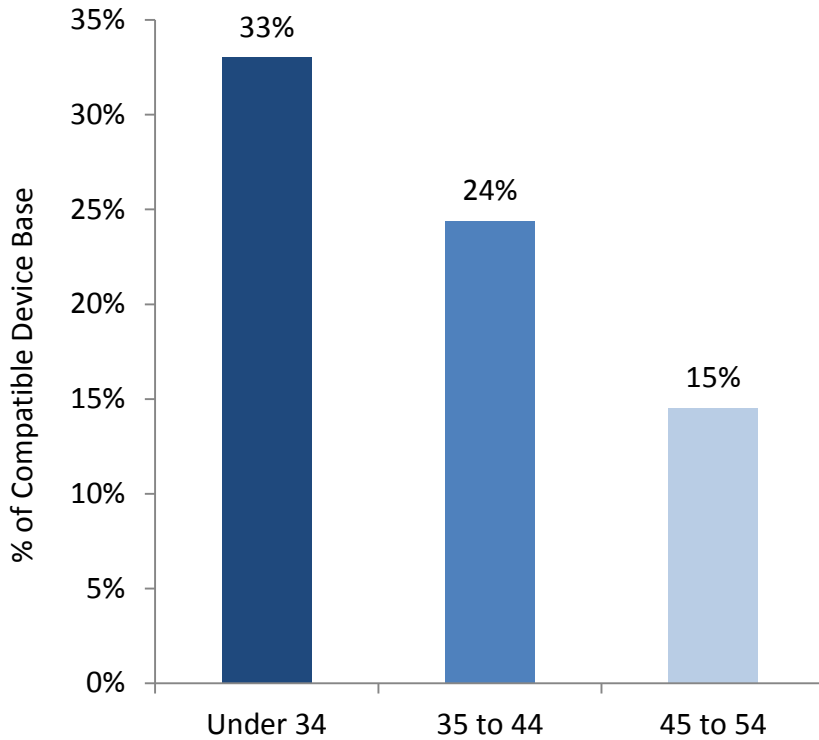


25% of Pay users report using the Pay service regularly (once a week or more), with Samsung Pay users reporting the highest frequency of use.

Enrollment in the Pay services is concentrated among younger respondents—but once enrolled, usage profiles are similar across age groups.

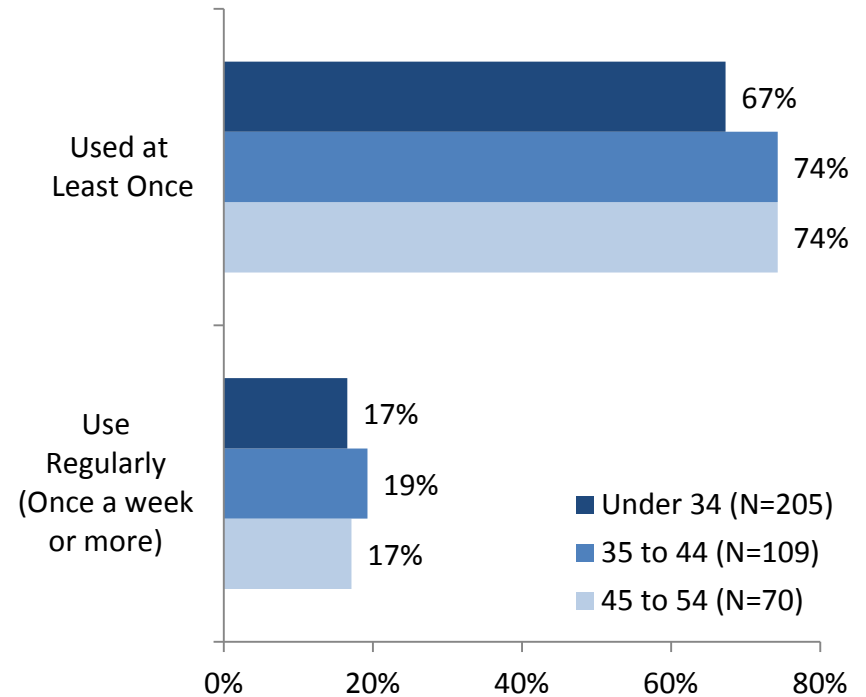
Adoption by Age Segment

All Pays



Usage by Age Segment

All Pays



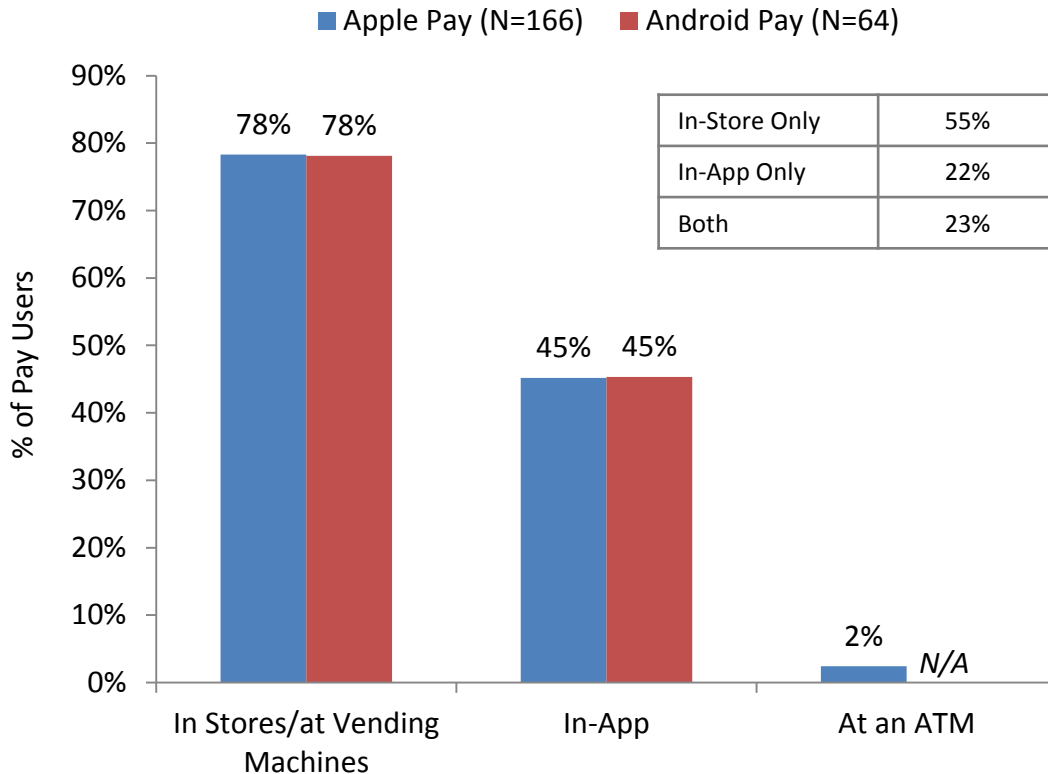
% of those Enrolled in Pay Services

Non-Millennials, once enrolled, are as likely to have used (and to use regularly) their chosen Pay service as are Millennials.

Most users have made a Pay purchase in stores (and more than half of users' experience is exclusively at retail locations), although in-app use is also common.

Point(s) of Usage

"Where have you used Apple Pay/Android Pay/Samsung Pay?"



Commentary

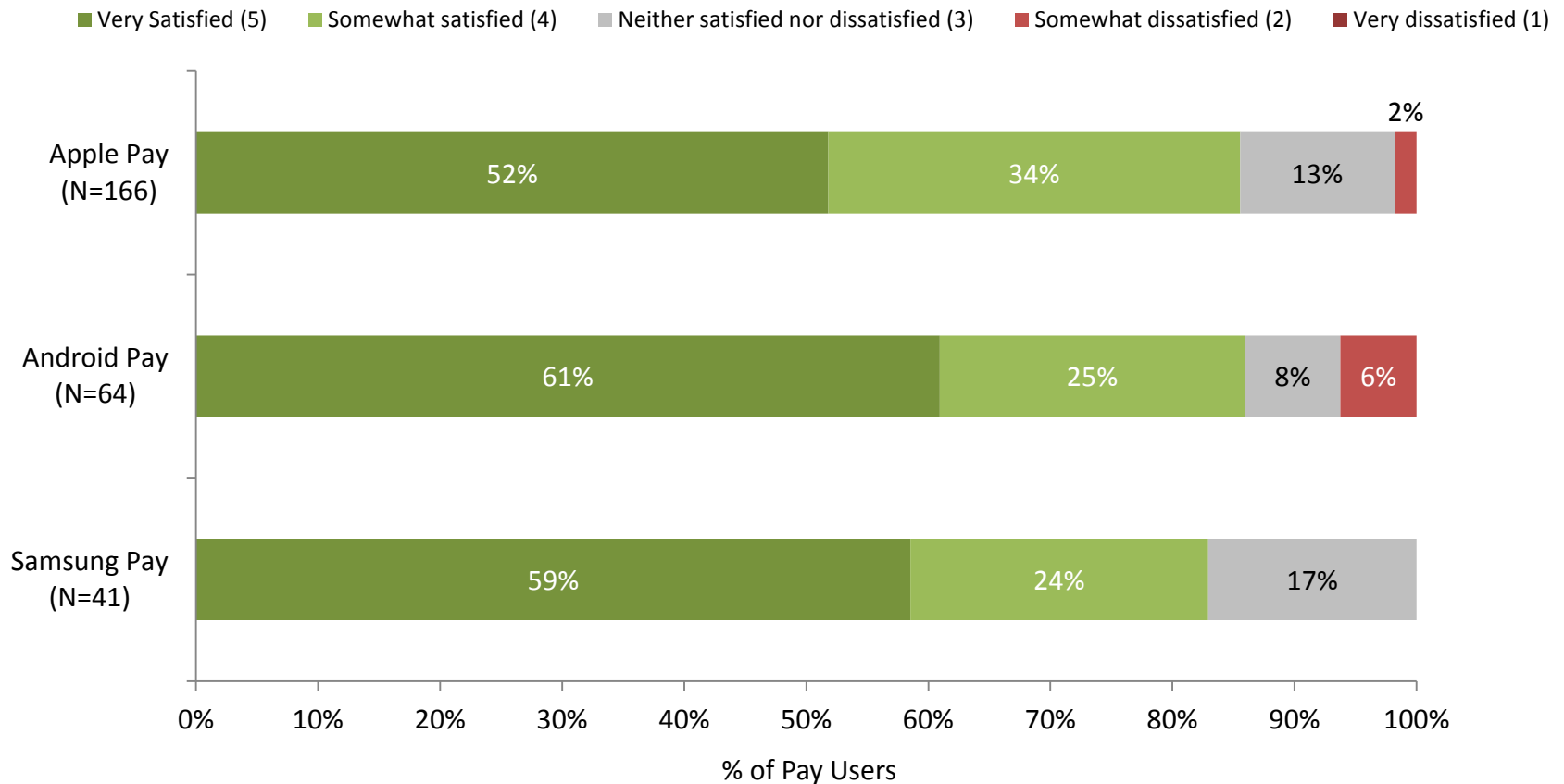
- Apple Pay and Android Pay acceptance is expanding.
- Bank of America, Wells Fargo, Chase, and others are enabling NFC ATM withdrawals using Apple Pay and Android Pay.
 - Bank of America is currently in pilot with Apple Pay at ~650 ATMs in CA.
 - Others have announced plans to roll out by year-end.
- Starting this Fall, Apple Pay will go head to head with PayPal, expanding into e-commerce and enabling users to make PC and mobile purchases through the Safari browser.

Samsung Pay is currently only available for in-store use.

User satisfaction ratings are high, with only a handful of detractors among Android Pay and Apple Pay users.

Satisfaction

“How satisfied are you with your Apple Pay/Android Pay/Samsung Pay experience?”

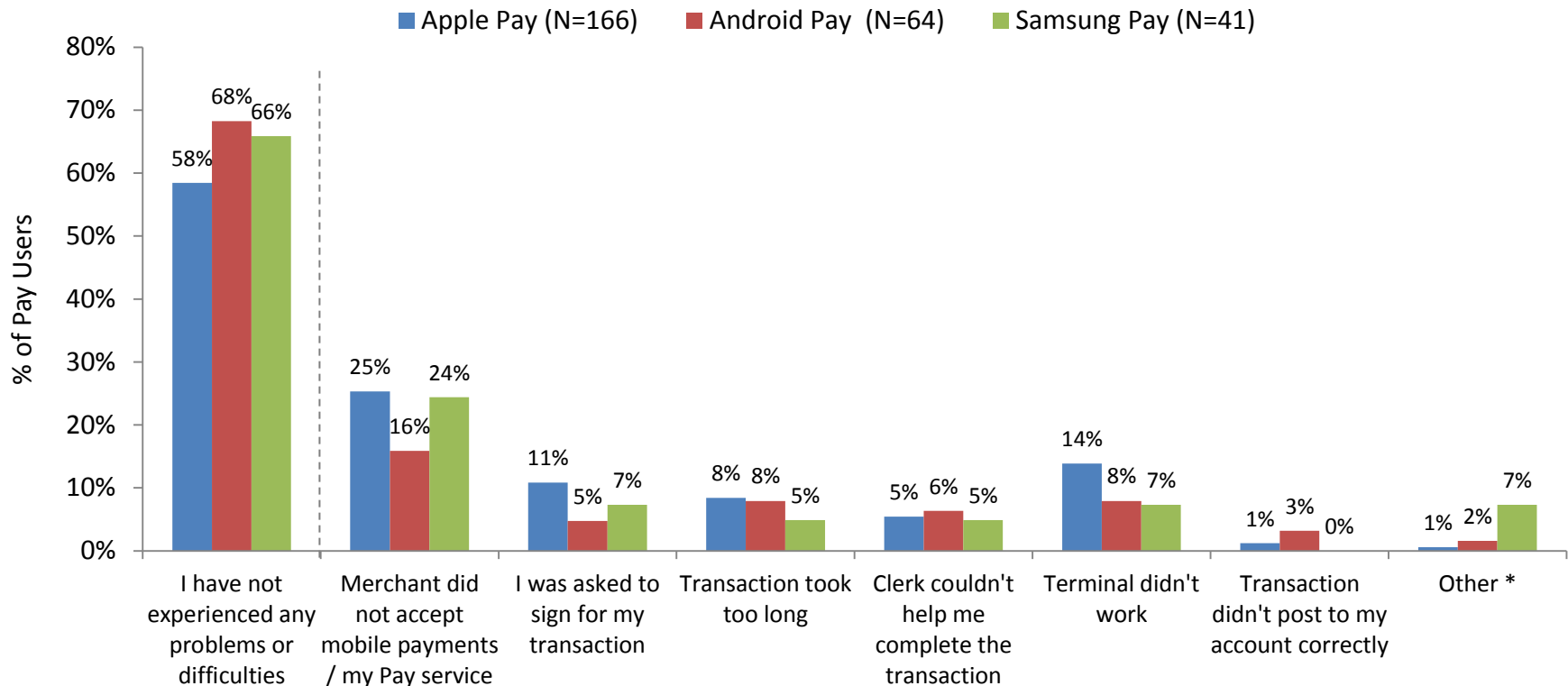


Users reported an average satisfaction rating of 4.4 of each of the three Pays, which is in-line with the high satisfaction ratings reported in previous studies.

Most users reported no issues using any of the Pay services; the most frequently cited issues were lack of acceptance and terminals not working properly.

Issues & Challenges

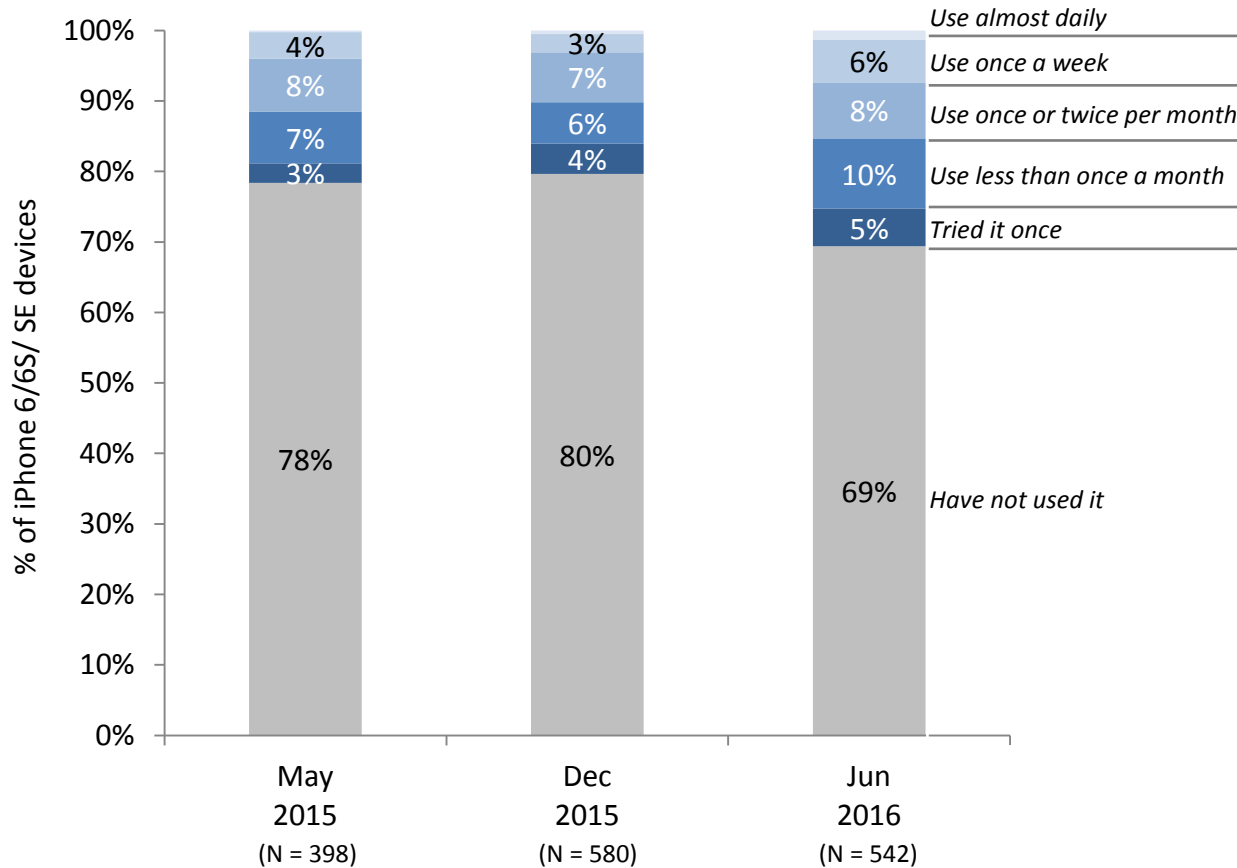
“Which of the following problems have you had using Apple Pay/Android Pay/Samsung Pay?”



Lack of acceptance was cited with equal frequency among Apple Pay and Samsung Pay users, despite near-universal acceptance of Samsung Pay's technology.

The percentage of iPhone 6 users that have used Apple Pay has increased from 22% to 31% since May 2015, and the percentage that uses it regularly has nearly doubled.

Change in Apple Pay Usage



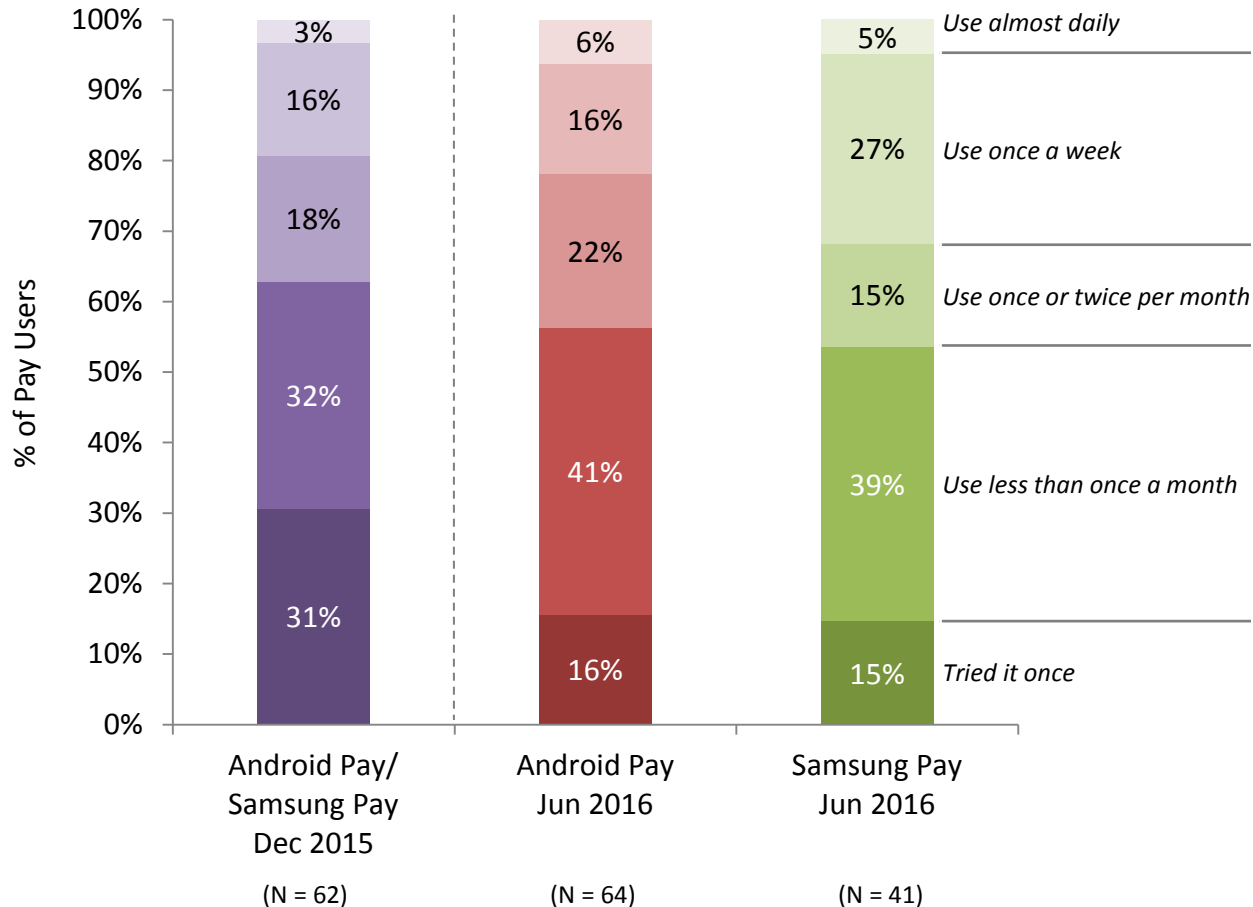
*The estimated share of Apple Pay-compatible devices increased from 39% in September 2015 to 54% in April 2016.**

*Assuming September device shares for December 2015, this would suggest that Apple Pay adoption by iPhone users has **doubled in the last 6 months**, from 8% to 17%.*

*Source: Localytics.

Comparison to December 2015 data suggests that repeat usage/usage frequency for both Android Pay and Samsung Pay users has also increased significantly.

Change in Android/Samsung Pay Usage*



*Note, adoption data for Android Pay and Samsung Pay is not backwards-compatible with the December 2015 study due to survey enhancements and changes in sample methodology; adoption rates will be tracked going forward.

Observations & Implications

1. Adoption and use of the Pays is increasing—and satisfaction levels among users are consistently high—but significant runway remains.
 - 75% of respondents with compatible devices have not enrolled in a Pay service.
 - 52% of Pay users are 'infrequent' users (one-time trial users or those who use it less than once per month).
2. Merchant acceptance (real and perceived) is the most common barrier to increasing frequency of use.
3. Increased deployment of contactless terminals with EMV migration (and relatively faster transactions times in comparison to chip transactions), as well as expansion into new acceptance channels, will facilitate increased adoption and usage.
4. Further integration into banks' mobile banking solutions will help drive adoption.
 - As noted earlier, respondents are most interested in getting their mobile wallet from their bank, and integration with mobile banking was a "must have" for many.
 - Increased integration will increase consumer utility and confidence.
5. Younger consumers are most likely to use a Pay service, and their habits will drive migration over time, but older demographics shouldn't be ignored.
6. Marketing and education beyond Millennials to encourage enrollment will help drive mainstream use.

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- Mobile Payments
- 'Pays' Experience
- **Mobile Banking**
- Survey Sample & Methodology

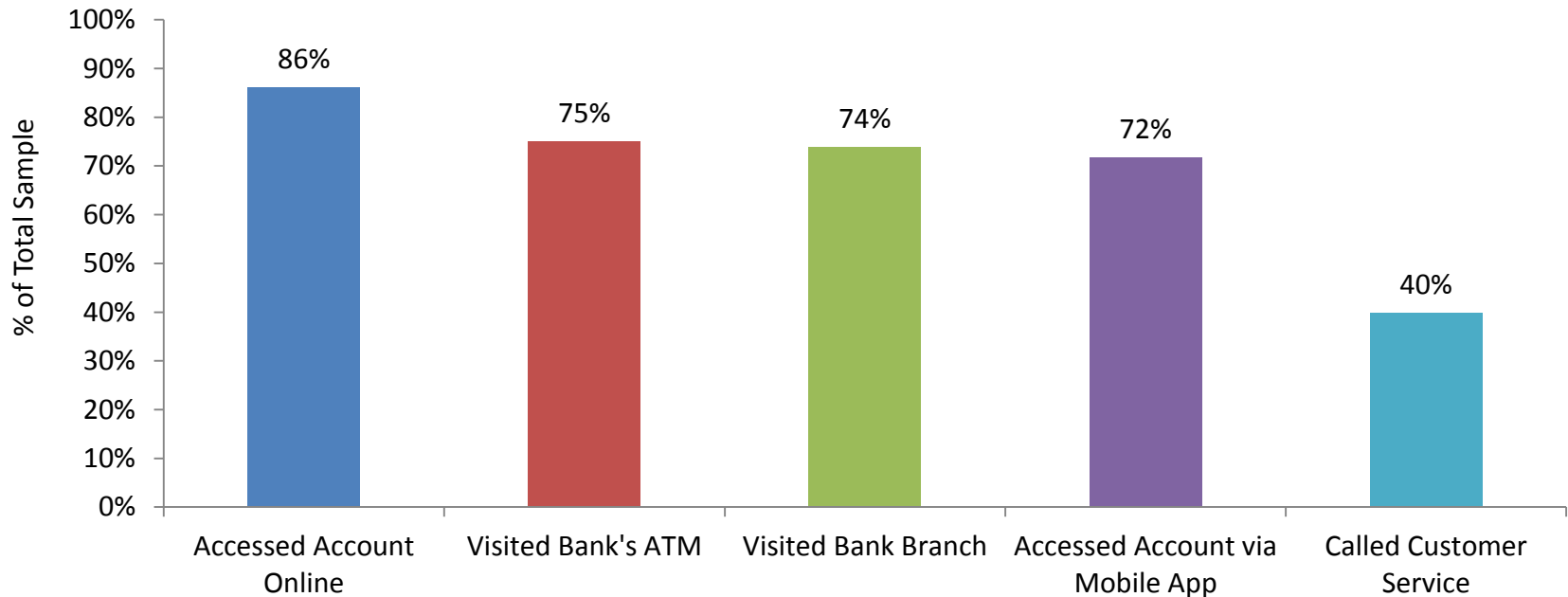
Mobile Banking

- Online account access is the most commonly used (86%) banking channel across respondents; 72% of respondents have used mobile banking.
- Mobile banking use is most prevalent across respondents aged 18 to 34, although two-thirds of consumers 45-54 also report using the channel.
- Approximately 80% of respondents reported accessing mobile and/or online banking regularly (once a week or more).
- Mobile banking users rely on their mobile app for basic servicing functions, and for many (87%) it is their primary channel for performing at least one such function.
- The most frequently cited mobile banking functions were checking balances/recent transactions, transferring funds between accounts, and depositing checks.
- Card controls via mobile apps are an emerging feature: 41% say that card controls are offered by their bank, and 19% have used them; most of those not familiar with the feature are at least 'somewhat' interested, and almost 30% are 'very' or 'extremely' interested.

Most consumers rely on multiple banking channels; more than 70% of respondents reported using each of the primary banking channels—including mobile banking.

Banking Channel Use

“Which of the following banking channels have you used in the past year?”
(N = 1,528)



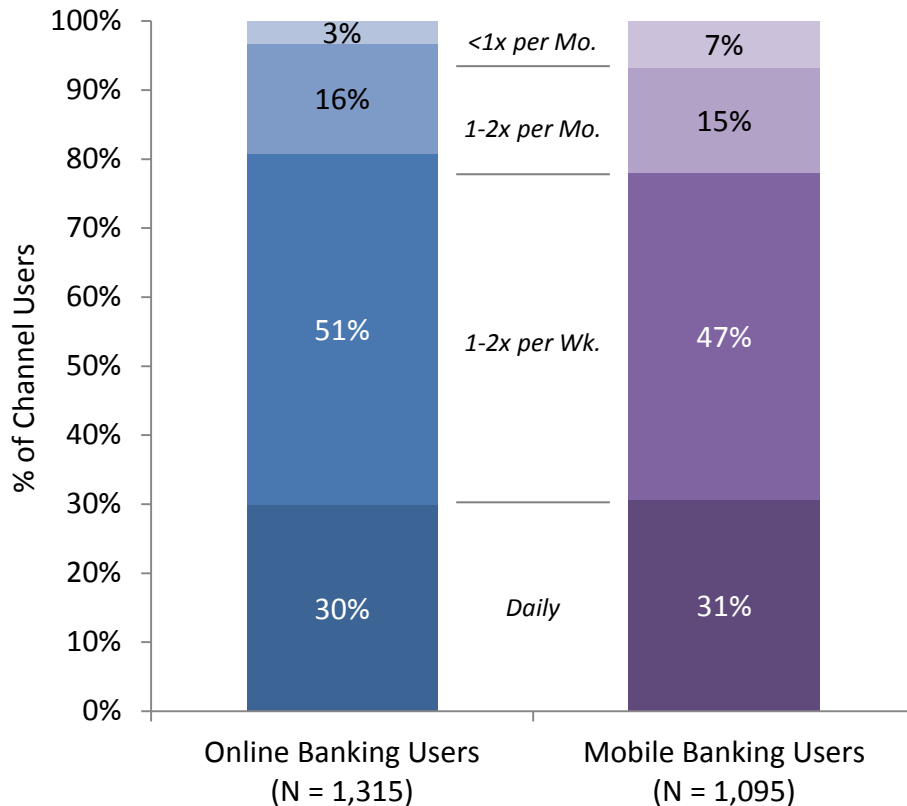
| Age Group | Accessed Account Online | Visited Bank's ATM | Visited Bank Branch | Accessed Account via Mobile App | Called Customer Service |
|-----------|-------------------------|--------------------|---------------------|---------------------------------|-------------------------|
| Under 35 | 87% | 72% | 70% | 79% | 41% |
| 35 – 44 | 87% | 76% | 75% | 71% | 39% |
| 45 – 54 | 84% | 78% | 78% | 64% | 40% |

Adoption of mobile banking is higher among younger consumers, but nearly two-thirds of those ages 45 to 54 report using the channel.

Consumers rely heavily on digital channels: 80% of users report accessing mobile and/or online banking regularly (once a week or more).

Online and Mobile Banking Frequency

Over the period of a month, how frequently do you log in to your bank's online or mobile banking portal?



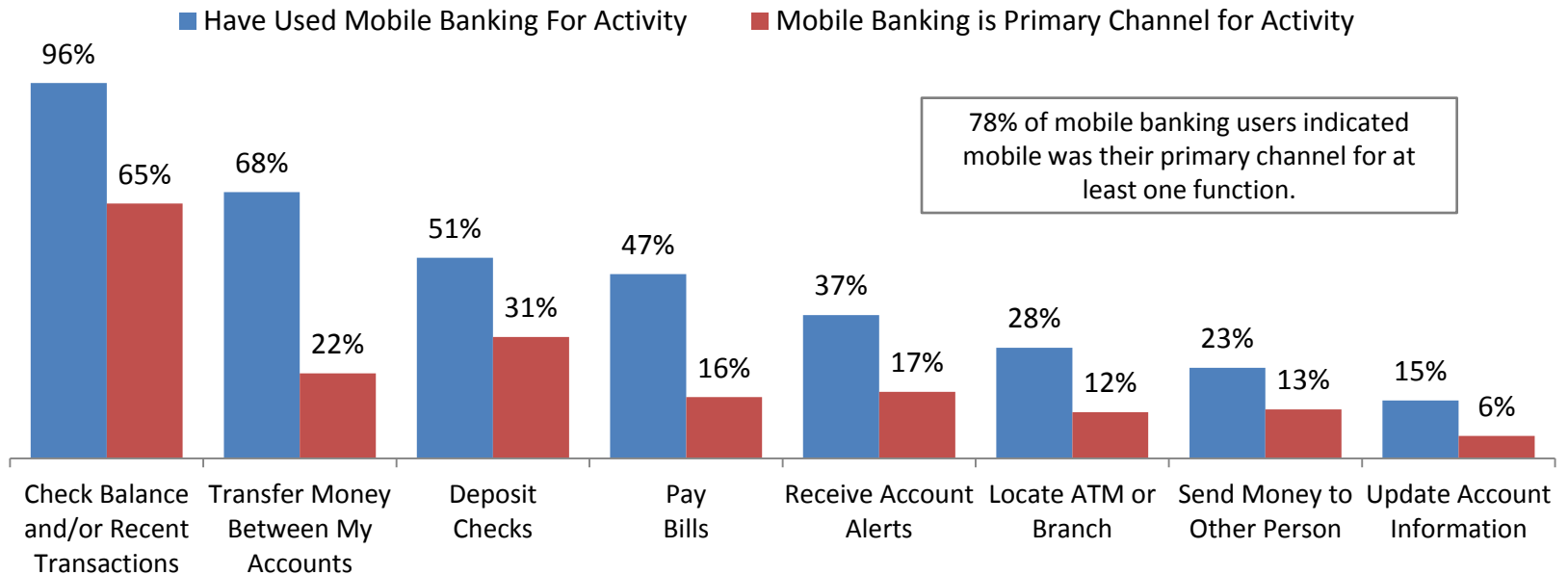
Commentary

- Approximately 50% of consumers log in to online/mobile banking at least once a week, while 30% log in daily.
- Usage patterns are similar across online and mobile banking, suggesting a high level of overlap across users.
- Among those that report using both online and mobile banking:
 - **71%** log in with the same frequency
 - **19%** log in to mobile banking more often than online banking
 - **10%** log in to online banking more often than mobile banking
- 7% of mobile banking users reported accessing his/her bank's app less than once a month, which may suggest that some users install the app but forget to log on.

Mobile banking users rely on their mobile app for basic servicing functions, and for many of them it is their primary channel for these functions.

Mobile Banking Usage

“What types of activities have you performed using your bank’s mobile app within the past twelve months?”
(N = 1,095)



Other Primary Channels

| Channel | Check Balance and/or Recent Transactions | Transfer Money Between My Accounts | Deposit Checks | Pay Bills | Receive Account Alerts | Locate ATM or Branch | Send Money to Other Person | Update Account Information |
|---------|--|------------------------------------|----------------|-----------|------------------------|----------------------|----------------------------|----------------------------|
| Website | 28% | 10% | 3% | 22% | 6% | 6% | 10% | 8% |
| ATM | 1% | 1% | 15% | 0% | 0% | 0% | 1% | 0% |
| Branch | 1% | 2% | 15% | 1% | 0% | 0% | 2% | 1% |
| Other* | 5% | 66% | 37% | 62% | 77% | 82% | 75% | 85% |

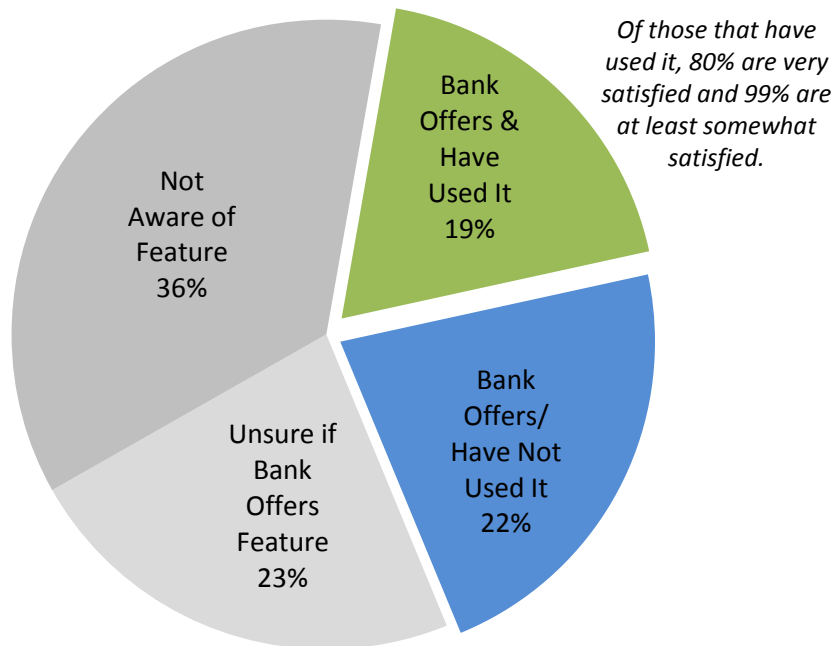
Indicates primary channel for banking activity

*Other includes respondents who use a different channel than those listed and respondents who have not performed this activity or have not used their bank to perform this function.

Card controls via mobile apps are an emerging feature: 41% of respondents say that card controls are offered by their bank, and 19% have used them.

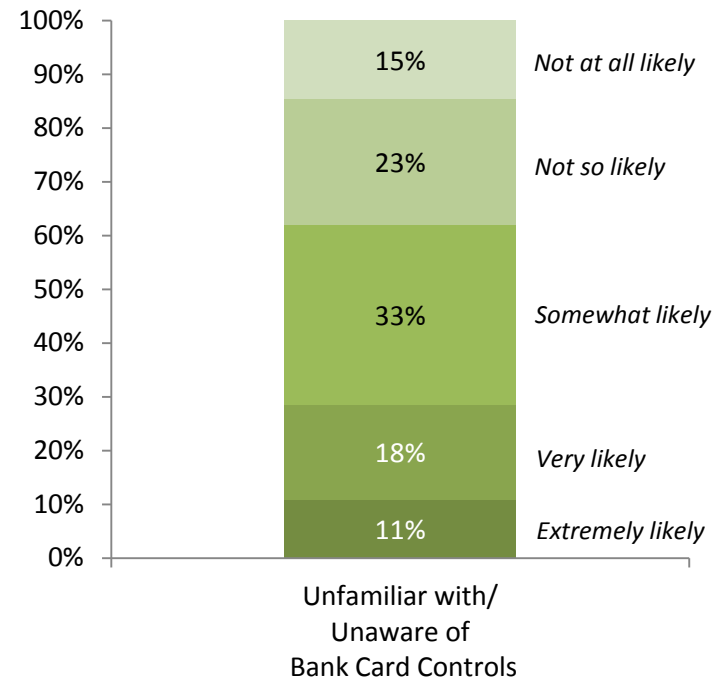
Card Control Awareness

Are you familiar with credit and/or debit card controls (spending limits, merchant location restrictions, etc.) via your mobile device?
(N = 1,528)



Card Control Potential Use

If your bank or credit card company offered the ability to put limits on the use of your card through their mobile app, how likely would you be to use this feature?
(N = 902)



Of those that were unfamiliar with card controls or were unaware if their bank offered them, 29% would be 'very' or 'extremely' likely to use them, and another 33% would be 'somewhat' likely.

Observations & Implications

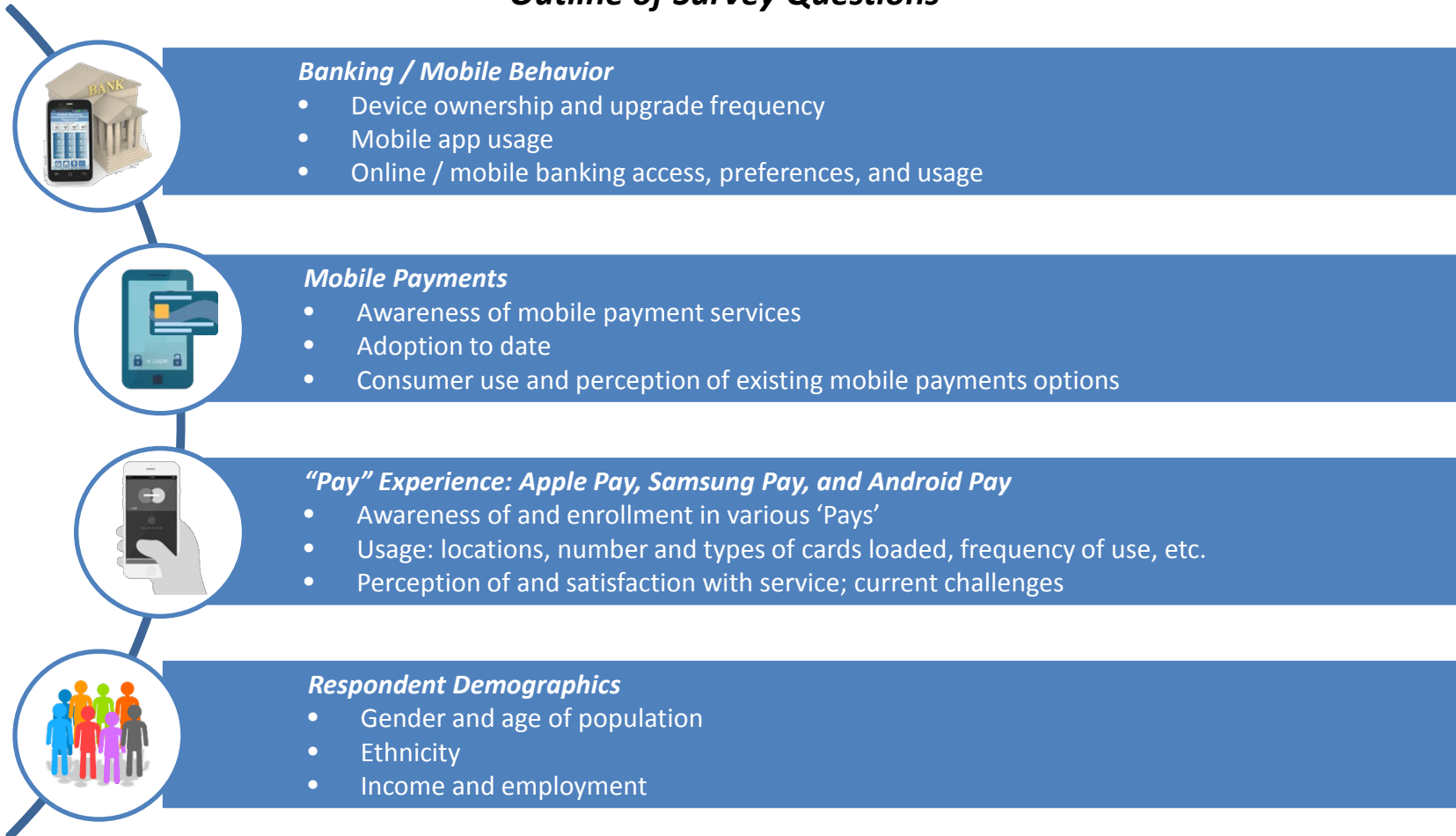
1. Mobile banking has quickly established itself as a primary customer service channel.
2. Both online and mobile users are highly engaged, high frequency users, underscoring the importance of a robust digital strategy.
3. Respondents who use mobile banking rely on the channel for the majority of their routine banking activities, but there are notable exceptions:
 - Mobile banking users are more likely to rely on online banking for bill payment and alerts; some of this preference may be situational, but some may be due to shortfalls in mobile banking apps.
 - Mobile banking users are less likely to use their bank for alerts and/or P2P payments, either because they do not use the service or because they are relying on a non-bank solution (e.g., Mint, Venmo).
4. Additional mobile functionality (e.g., card controls) is of-interest to many consumers.

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- **Survey Sample & Methodology**

The most recent survey expanded on previous studies to explore consumers' mobile banking and payments experience and attitudes, with a specific focus on the 'Pays'.

Outline of Survey Questions



Study findings are based on a sample of 1,528 U.S. smartphone users who participated in an online survey in June 2016.

Our survey sample is generally in-line with U.S. census distributions for based on age and gender.

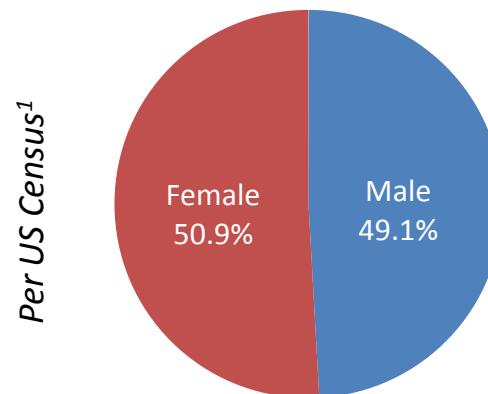
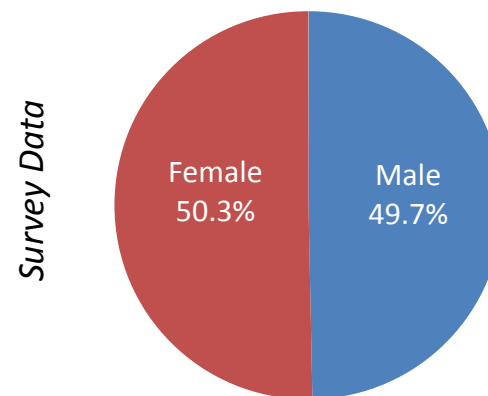
Age Distribution

(N = 1,528)

| Age | Per Survey | Per Census ¹ | Variance |
|-------|------------|-------------------------|----------|
| 18-19 | 2% | 5% ² | (3%) |
| 20-24 | 9% | 14% | (5%) |
| 25-29 | 13% | 14% | (1%) |
| 30-34 | 16% | 13% | 3% |
| 35-39 | 16% | 12% | 4% |
| 40-44 | 13% | 13% | - |
| 45-49 | 15% | 14% | 1% |
| 50-54 | 16% | 14% | 2% |

Gender Distribution

(N = 1,528)

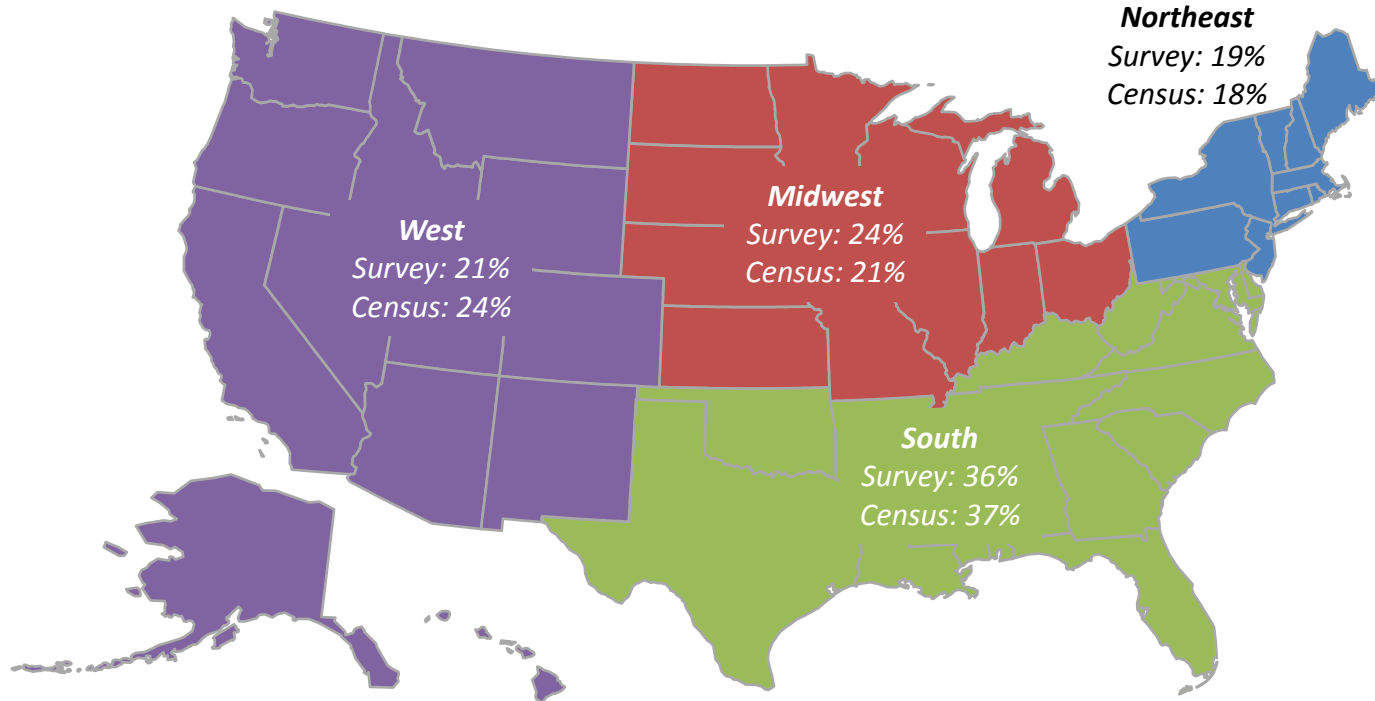


¹ Per the 2013 Age and Sex Composition data compiled by the U.S. Census Bureau; most recent available data at time of printing.

² Census data is aggregated from 15-19; we assumed an even spread over this age group and calculated the pro rata number of individuals that would fall within the ages of 18-19.

Regional and ethnic distributions for the survey sample are also generally in-line with U.S. census distributions.

Geographic and Ethnic Distribution



| Ethnicity | Caucasian or White | African American, Black or Caribbean American | Asian American or Pacific Islander | Native American, Inuit or Aleut | Other ¹ | Hispanic |
|---------------------|--------------------|---|------------------------------------|---------------------------------|--------------------|----------|
| Survey | 72% | 13% | 6% | 1% | 7% | 15% |
| Census ² | 77% | 13% | 6% | 1% | 3% | 18% |

¹Other includes survey participants who opted not to disclose their ethnicity.

²Census ethnic data is based on July 2015 estimates provided by the U.S. Census Bureau.

The surveyed population skews towards middle- and upper-income consumers compared to the general U.S. population.

Survey Population by Household Income

(N = 1,582)

■ Per survey ■ Per census

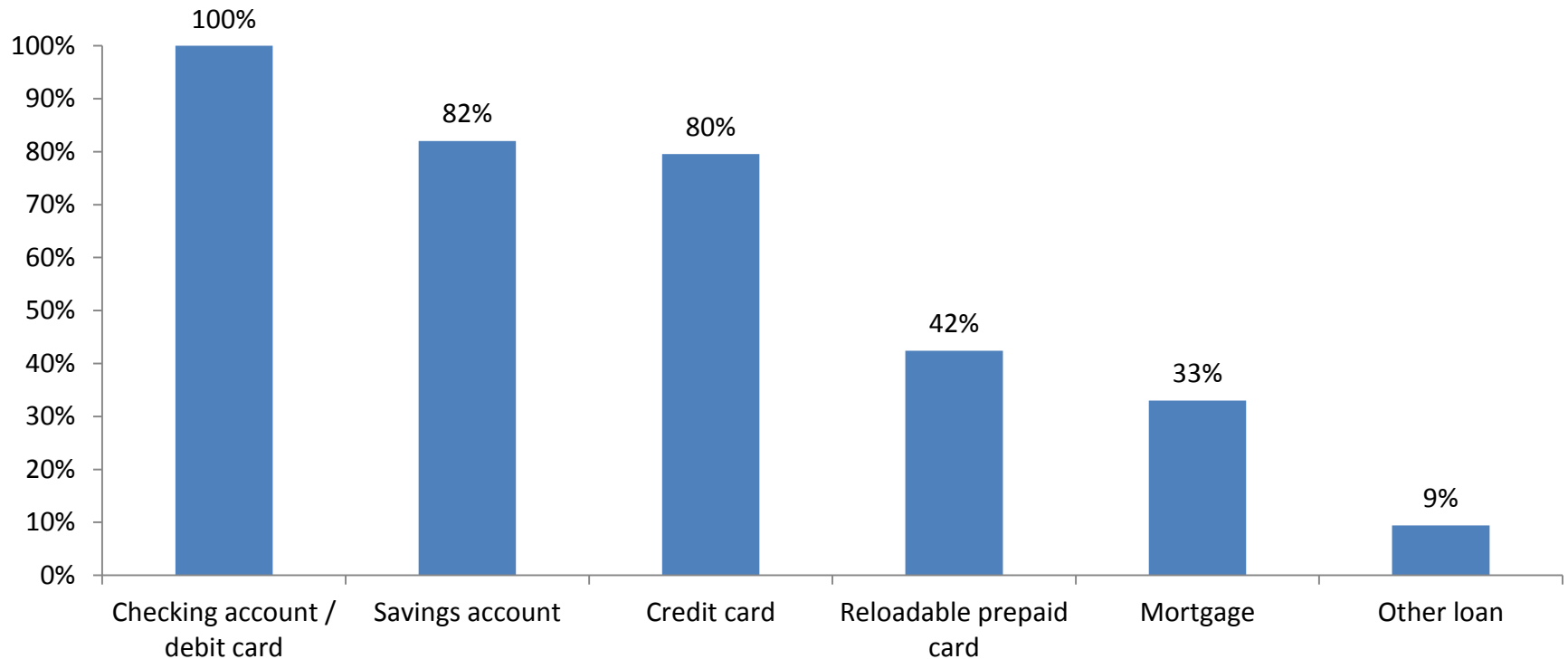


The skew towards higher income respondents may be reflective the survey qualification requirements, which included ownership of a checking account/debit card and smartphone.

Individuals were required to have a checking account/debit card to participate in the research study.

Banking Behavior of Qualified Respondents

(N = 1,582)



A high percentage of participants also had credit cards and/or reloadable prepaid cards, which also are supported by mobile payments.

Earlier editions of the study were based on consumer surveys conducted in May 2015 and December 2015.

Comparison to Previous Studies

| | May 2015 | December 2015 | June 2016 |
|-----------------------------|-----------------|----------------------|------------------|
| Sample | 1,002 | 1,279 | 1,528 |
| Age | | | |
| 18-19 | 1% | 1% | 2% |
| 20-24 | 15% | 10% | 9% |
| 25-29 | 13% | 15% | 13% |
| 30-34 | 17% | 17% | 16% |
| 35-39 | 13% | 17% | 16% |
| 40-44 | 16% | 15% | 13% |
| 45-49 | 11% | 11% | 15% |
| 50-54 | 14% | 13% | 16% |
| Device Ownership (%) | | | |
| <i>iPhone 6 or 6S</i> | 40% | 45% | 35% |
| <i>Other iPhone</i> | 29% | 13% | 12% |
| <i>Samsung Galaxy</i> | N/A | 19% | 21% |
| <i>Other Android</i> | 28% | 19% | 28% |
| <i>Other</i> | 3% | 4% | 4% |

Note: May 2015 survey did not include Samsung Galaxy devices. Other smartphone devices include Microsoft phones, Blackberries, and other smartphones.



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