



The Internet of Things

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IAB

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Intro and Objectives

The IAB commissioned Maru/Matchbox to conduct a consumer study to gain visibility into consumer adoption of Connected Devices and the Internet of Things in order to inform the industry about this exciting new technology and emerging market.

The study was conducted among 1200 consumers, representative of the US adult population, in order to understand who uses connected devices, which devices, how they use them, how often they use them and how frequently, if at all, they engage these devices with their smartphones, tablets and computers. The devices examined included connected cars, internet-enabled home control devices/systems, internet-enabled appliances, smart watches, wearable health trackers, internet-enabled voice command systems, connected/smart TVs, VR headsets and smart glasses.

The research further sought to discover how owners of these devices learned about them and how receptive they are to advertising on their devices or potentially on the devices they connect to.

Among those who don't own a connected device, the research sought to gain interest in how many of them have heard of each device, how interested they are in the devices and how they perceive the devices.

The study also aimed to reveal consumer interest in upcoming technologies like self-driving cars and wearable fabrics as well as existing technologies like smartphone voice control systems, store apps and beaconing, smart labels and, of course, Pokémon Go.

Methodology

The IAB (Interactive Advertising Bureau) wanted to better understand the Internet of Things in 2016. More specifically, the IAB wanted to gauge awareness and use of devices within the Internet of Things, interest in emerging new devices and receptivity to potential advertising applications.

The IAB partnered with Maru/Matchbox on this quantitative research. Research was conducted among Maru/Matchbox's Springboard America online panel (~250,000 US members) using an online survey.

- n=1,200 representative of US 18-74 year-olds
- The survey was fielded 8/3/2016-8/8/2016

Notes: Significance testing at 95% confidence intervals are denoted as follows:

- M/F = significant among gender
- 18-34/35-54/55-74= significant versus other two age breaks
- Ethnicity= significant versus all others

IoT Connected Device Examples

Consumers were asked if they were aware of, owned or were interested in purchasing any of the following devices. The examples below were given to consumers when asking about their awareness, ownership and interest in them:

- Connected car (with internet access - not just Bluetooth - that can be used with other devices)
- Internet-enabled home control devices/systems (Nest, home security, etc.)
- Internet-enabled appliances (smart refrigerator, washer/dryer, etc.)
- Smart watch (Apple Watch, etc.)
- Wearable health tracker (FitBit, JawBone, etc.)
- Internet-enabled voice command systems (Amazon Echo, etc.)
- Connected/Smart TV OR streaming device connected to TV
- VR headsets (Google Cardboard, Samsung Gear VR, etc.)
- Smart glasses (Google Glass, etc.)

Summary

Key findings from the study reveal:

- › 62% of US adults own at least one connected device. Among those who don't own a connected device, nearly all have heard of connected devices and 65% are interested in purchasing one.
- › Connected/Smart TVs are the most popularly owned connected devices; Nearly half of US adults own one.
- › Nearly all have heard of connected devices, especially smart watches, connected TVs, fitness tracker and home control systems.
- › Over one-third of US adults are interested in buying a connected TV or connected car
- › Digital media plays an important role in consumers' discovery and seeking more information about connected devices. Roughly 1 in 4 first heard about smart glasses, VR headsets or voice command systems from any digital source (desktop or mobile display ad, article, video, video ad or social media). 1 in 3 sought out more information about VR headsets from digital sources.
- › Top 3 methods of learning more about connected devices include TV commercials, word of mouth and online articles, providing opportunities for native advertising and other online advertising.
- › The connected devices with the strongest adoption thus far share usefulness as their top attribute.
- › The average connected device owner tends to be a college educated parent between the ages of 18-34 with above average income who tends to be willing to receive ads on the device. Owners of most connected devices tend to be male except for owners of wearable health trackers.

Summary

- Those interested in buying a connected device vary in age and gender by device but tend to be college educated, excited about technology and receptive to potential IoT ads.
- Nearly all Internet-enabled home devices/systems/appliances are currently connected to the internet.
- Wearables and connected home devices are used at least once a day.
- Most connected devices are used in conjunction with a smartphone/computer/tablet on a daily basis or more frequently, especially owners of smart watches, connected cars and health trackers.
- Most wearable device owners have received notifications about their devices on smartphones/computers/tablets.
- Almost two-thirds (62%) of connected device owners report having seen an ad on their device.
- More than half (55%) of consumers are willing to receive ads on their devices in exchange for coupons/discounts, extra features or access to exclusive games. 65% of device owners are willing to receive such ads.
- The affluent (69% who earn \$100k or more) and young (68% of 18-34 year olds) are more likely to see the value exchange of receiving such ads on their devices.
- A majority of consumers (54%) feel good about technology – led by younger Males.

Connected Device Awareness, Ownership & Interest

62% of US adults own at least one connected device

- Among those who don't own a connected device, nearly all have heard of connected devices and about two-thirds are interested in purchasing one

Connected Device Ownership

Among Total US Adults 18 and older

(Connected cars, wearables, fitness trackers, smartwatches, VR headsets, smart glasses, connected/smart TVs, internet-enabled voice command, home control systems or appliances)

62%

Own a connected device

Connected Device Awareness & Interest

Among Total US Adults 18 and older who don't own a connected device

97%

Heard of connected devices

65%_M

Interested in Purchasing a connected Device

Text next to the numbers indicates that that group over indexes on that attribute. For ex., M = more likely among men, W = more likely among women, Asian = more likely among Asians, 18-34 = more likely among 18-34 year olds, 35-54 = more likely among 18-34 year olds, 55+ = more likely among 55 year olds and older

Q1. Which of the following have you heard of and do you personally own?

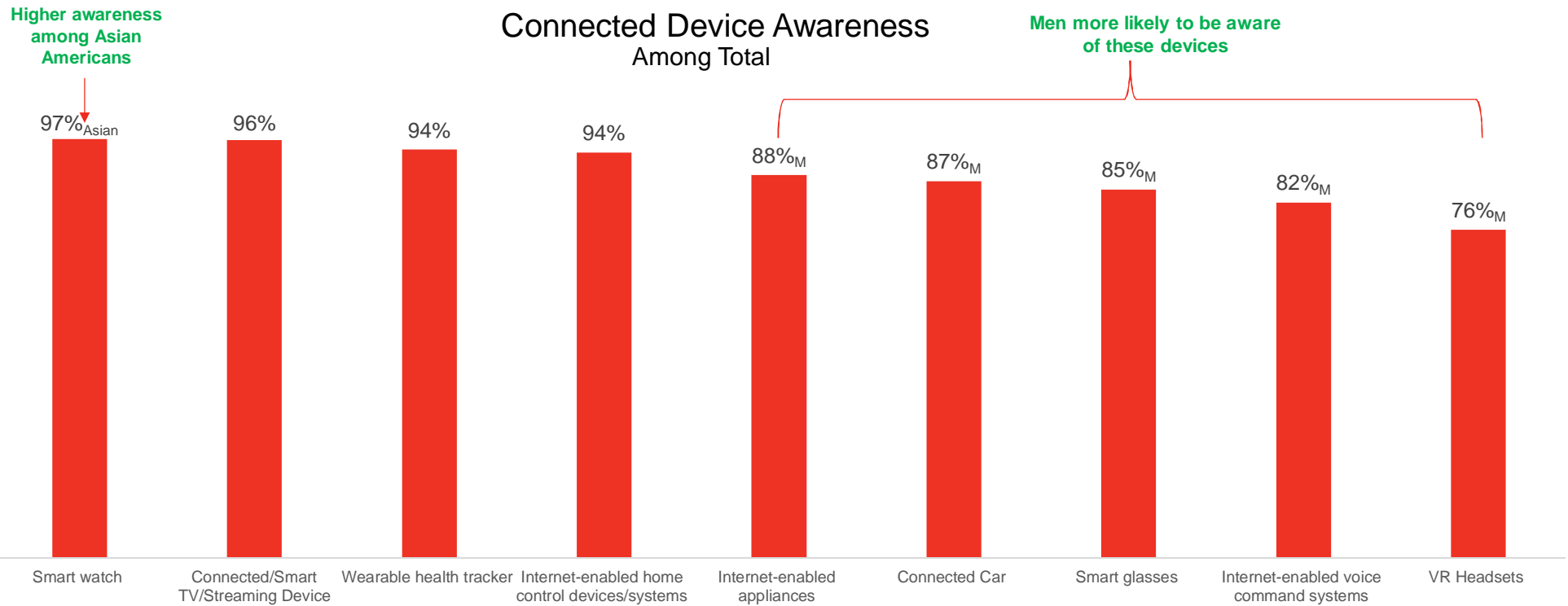
Base: Total, n=1209. US Adults 18+

Q2. How interested are you in purchasing each of these devices?

Base: Floating – aware but don't own device.

Most consumers have heard of these connected device types

Especially smart watches, connected TVs, fitness tracker and home control systems



■ Heard of

Text next to the numbers indicates that that group over indexes on that attribute. For ex., M = more likely among men, W = more likely among women, Asian = more likely among Asians, 18-34 = more likely among 18-34 year olds, 35-54 = more likely among 35-54 year olds, 55+ = more likely among 55 year olds and older

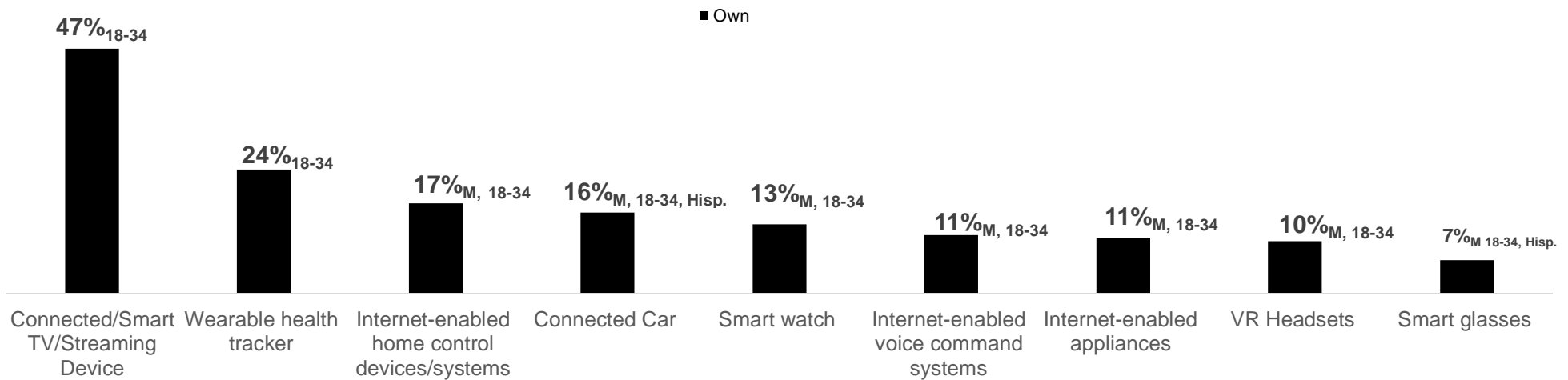
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Base: Total, n=1209. US Adults 18+

Connected/Smart TVs are the most popularly owned connected devices; Nearly half of US adults own one

- Nearly one in four own a wearable fitness tracker
- Males and 18-34 year olds are most likely to own a connected device

Connected Device Ownership
Among Total



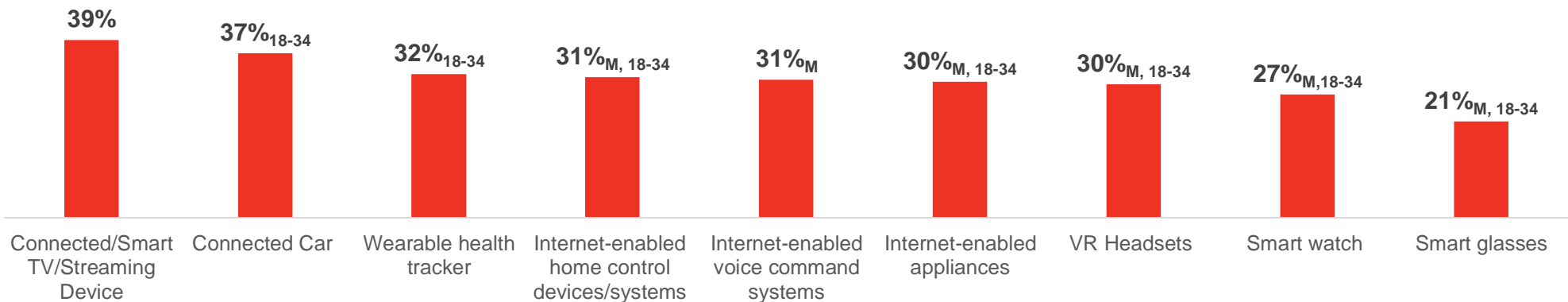
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Over one-third of US adults are interested in buying a Connected TV or Connected Car

- Purchase interest for most connected devices is also higher among Males and 18-34 year olds.

Connected Device Purchase Interest
(Very/Somewhat Interested)
Among those who are aware of but don't own the device



Q2. How interested are you in purchasing each of these devices?
Base: Floating – aware but don't own device.

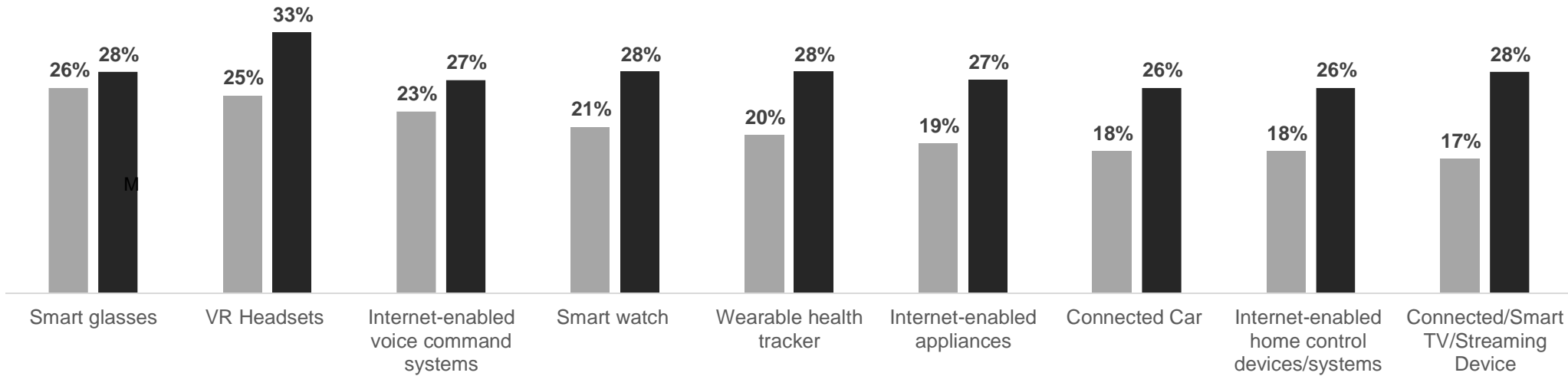
Digital media plays an important role in consumers' discovery and seeking more information about connected devices

- Roughly 1 in 4 first heard about smart glasses, VR headsets or voice command systems from any digital source (desktop or mobile display ad, article, video, video ad or social media)
- 1 in 3 sought out more information about VR headsets from digital sources

How First Heard About and How Learned More About Connected Devices

Among those who own or are aware of the device

■ First Heard About Device from Any Digital Source ■ Learned More About Device from Any Digital Source
 (Digital sources asked of respondents include desktop or mobile display ad, article, video, video ad, social media post or ad)



Q. How did you first hear about each device?

Q. How did you get more information about each device – including its features, companies that provide it, etc.?

Base: Floating - Aware of each device.

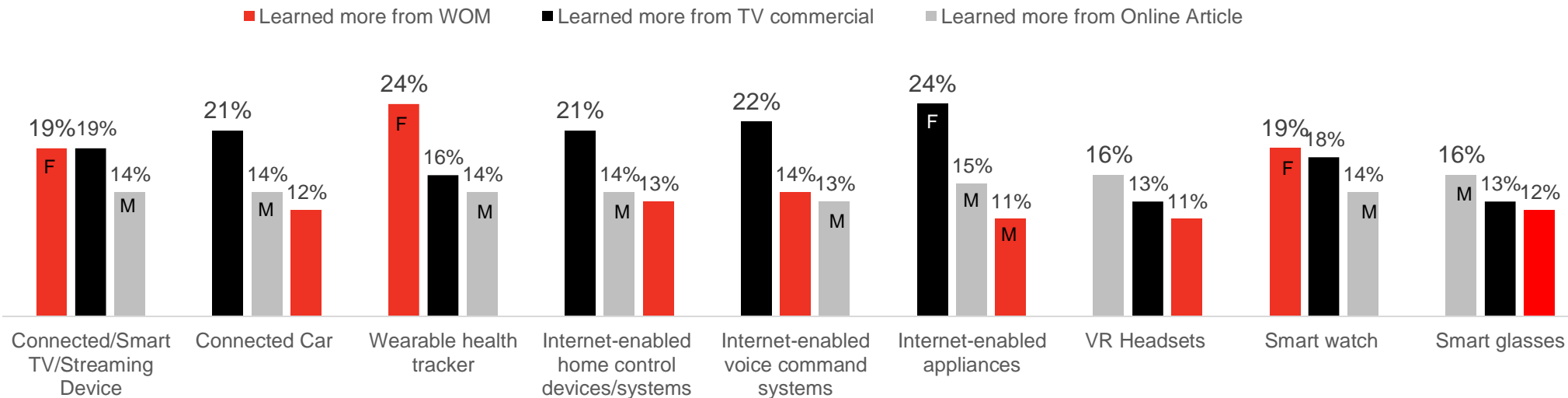
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Specifically, top methods of learning more about connected devices include TV commercials, word of mouth and online articles

- Roughly 15% learn more about connected devices by reading online articles, providing opportunities for native advertising and other online advertising
- Online articles are the #1 means to learn more about VR and Smart Glasses and the #2 method to learn more about Home Control Devices and Appliances

How Learned More About Connected Devices

Among those who are aware of the device
(sorted by device purchase interest)



Q2d. How did you get more information about each device – including its features, companies that provide it, etc.?
Base: Floating - Aware of each device.

The connected devices with the strongest adoption thus far share usefulness as their top attribute

- The most popularly owned devices are also described as Convenient and Innovative

Top 3 Connected Device Attributes

Among those aware of the device. Devices ranked on ownership

Connected/Smart TV/Streaming Device		Wearable Health Tracker		Internet-enabled Home Control Devices		Connected Car	
	47% own		24% own		17% own		16% own
Useful	41%	Useful	46% _F	Useful	41%	Useful	35%
Convenient	38% _F	Innovative	35% _F	Innovative	36%	Luxury item	35%
Innovative	36%	Convenient	27% _F	Convenient	31%	Innovative	34%

Smart Watch		Internet-enabled Appliances		Internet-enabled Voice Command Systems		VR Headsets		Smart Glasses	
	13% own		11% own		11% own		10% own		7% own
Luxury item	36% _F	Luxury item	37% _F	Innovative	32%	Fun	32%	Unnecessary	32%
Innovative	32%	Innovative	35%	Useful	30%	Innovative	31% _{M, 18-34}	Luxury item	31%
Cool	30%	Useful	32%	Cool	27%	Cool	30% _{M, 18-34}	Innovative	28%

Q2a. Based on what you know or have heard, which of the following words/statements do you feel describe each of these devices?
Base: Floating – Aware of each device.

The typical IoT device owner is...

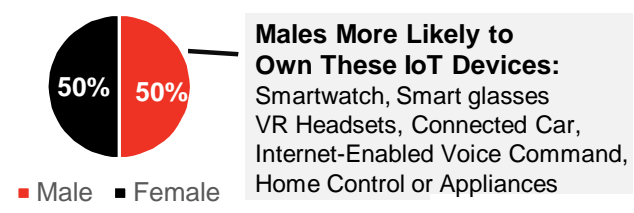
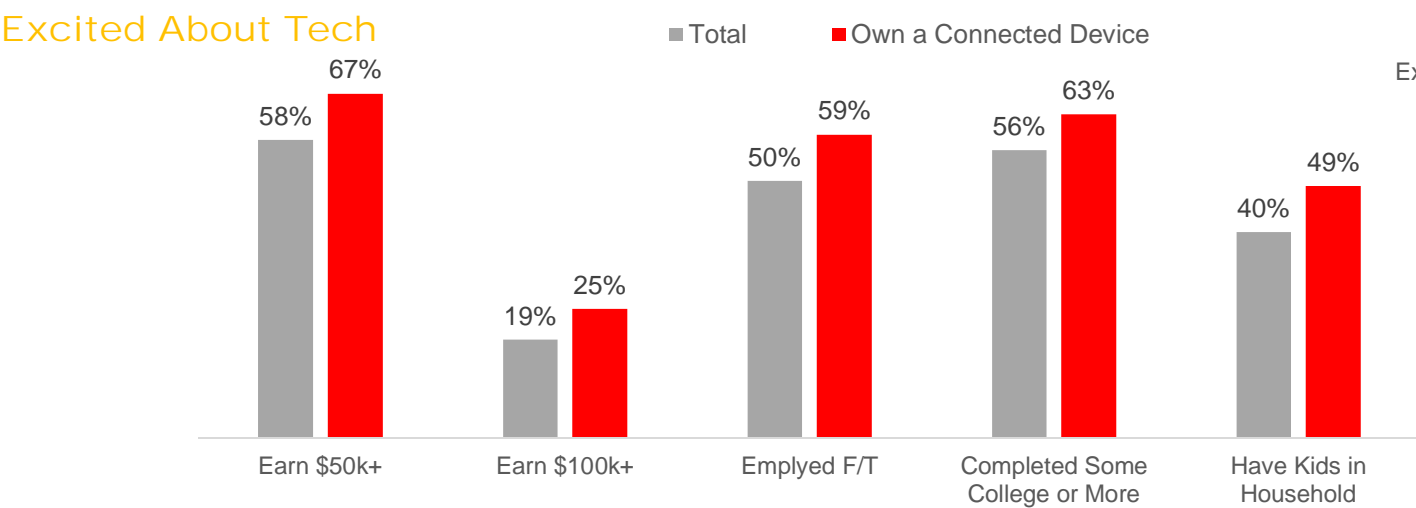
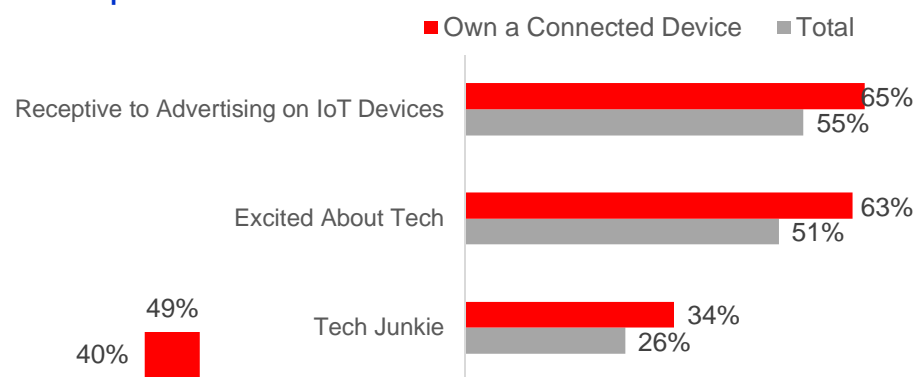
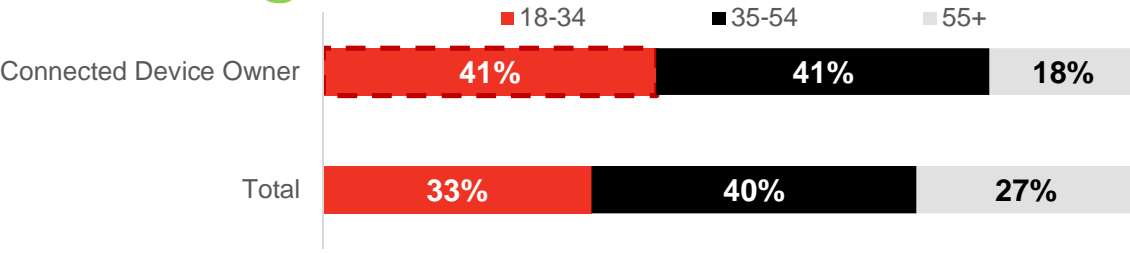
Young

Higher Income

College Educated

Parent

Open to Ads



Q1. Which of the following have you heard of and do you personally own?
 Base: Total, n=1209. US Adults 18+

Owners of most connected devices tend to be college educated male parents between the ages of 18-34 with above average income who tend to say they are willing to receive ads.

They also tend to be ‘Tech Junkies’ who are excited about technology and already own a connected TV.

Device Owned	Own Any IoT Device	Wearable health tracker	Smart watch	Smart glasses	VR Headsets	Internet-enabled voice command	Internet-enabled home control	Internet-enabled appliances	Connected/ Smart TV	Connected Car
M/F Skew	50% M/F	52% F	65% M	70% M	63% M	66% M	61% M	65% M	52% M	61% M
Age Skew	41% 18-34, 41% 35-54	50% 18-34	57% 18-34	66% 18-34	53% 18-34	52% 18-34	50% 18-34	61% 18-34	41% 35-54	51% 18-34
Make 50K +	67%	76%	80%	76%	78%	78%	80%	79%	69%	82%
Have kids in HH	49%	57%	71%	84%	80%	69%	67%	77%	51%	64%
Completed some college or more	63%	92%	93%	89%	95%	88%	93%	93%	89%	91%
Employed F/T	59%	72%	81%	78%	78%	77%	75%	75%	61%	73%
Tech Junkies	34%	44%	63%	78%	68%	66%	57%	73%	35%	60%
Excited About Tech	63%	72%	79%	87%	82%	82%	75%	82%	65%	74%
Receptive to IoT advertising	65%	72%	86%	95%	89%	84%	78%	89%	66%	87%
Highest device crossover	N/A	Connected TV 69%	Connected TV 78%	Internet-Enabled Home Control 82%	Connected TV 79%	Connected TV 82%	Connected TV 75%	Connected TV 76%	Wearable health tracker 35%	Connected TV 71%
2nd highest device crossover	N/A	Internet-enabled Home Control 38%	Internet-enabled Home Ctrl 58%	Smartwatch, Connected TV, Internet-enabled Appliances 76%	Internet-enabled Home Control 61%	Internet-enabled Home Control 66%	Wearable health tracker 52%	Internet-enabled Home Control 69%	Internet-enabled Home Control 28%	Internet-enabled Home Control 55%

Those interested in buying a connected device vary in age and gender by device but tend to be college educated, excited about technology and receptive to IoT ads

➤ They also tend to be ‘Tech Junkies’ who already own a connected TV.

	Wearable health tracker	Smart watch	Smart glasses	VR Headsets	Internet-enabled voice command	Internet-enabled home control	Internet-enabled appliances	Connected/ Smart TV	Connected Car
M/F Skew	53% F	53% M	69% M	65% M	59% M	57% M	55% M	52% F	51% M
Age Skew	43% 35-54	47% 18-34	48% 18-34	47%18-34	46% 35-54	44% 35-54	44% 35-54	43% 35-54	43% 35-54
Make 50K +	59%	60%	65%	62%	67%	64%	67%	52%	62%
Have kids in HH	51%	54%	59%	55%	53%	51%	58%	39%	51%
Completed some college or more	84%	84%	87%	84%	87%	88%	89%	80%	86%
Employed full-time	55%	56%	66%	64%	61%	59%	64%	49%	61%
Tech Junkies	36%	45%	57%	51%	44%	38%	44%	29%	37%
Excited About Tech	66%	75%	83%	80%	77%	72%	76%	60%	73%
IoT Ad Receptivity	72%	74%	85%	77%	75%	73%	77%	66%	70%
Top Device Already Owned	Connected TV 56%	Connected TV 59%	Connected TV 66%	Connected TV 64%	Connected TV 61%	Connected TV 59%	Conn. TV 66%	Wearable Health Tracker 20%	Connected TV 59%
2nd Likeliest Device Owned	Connected home control devices/sys 18%	Wearable Health Tracker 33%	Wearable Health Tracker 38%	Wearable Health Tracker 34%	Wearable Health Tracker 36%	Wearable Health Tracker 29%	Wearable Health Tracker 33%	Connected Car 14%	Wearable Health Tracker 27%

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Connected Device Usage & Interactions with Smartphones/Tablets/Computers

Nearly all Internet-enabled home devices/systems/appliances are currently connected to the internet.

➤ Device Connection to Internet

Among device owners

88%

Internet-enabled voice command systems



80%_M

Internet-enabled home control devices/systems



69%_{M, ASIAN}

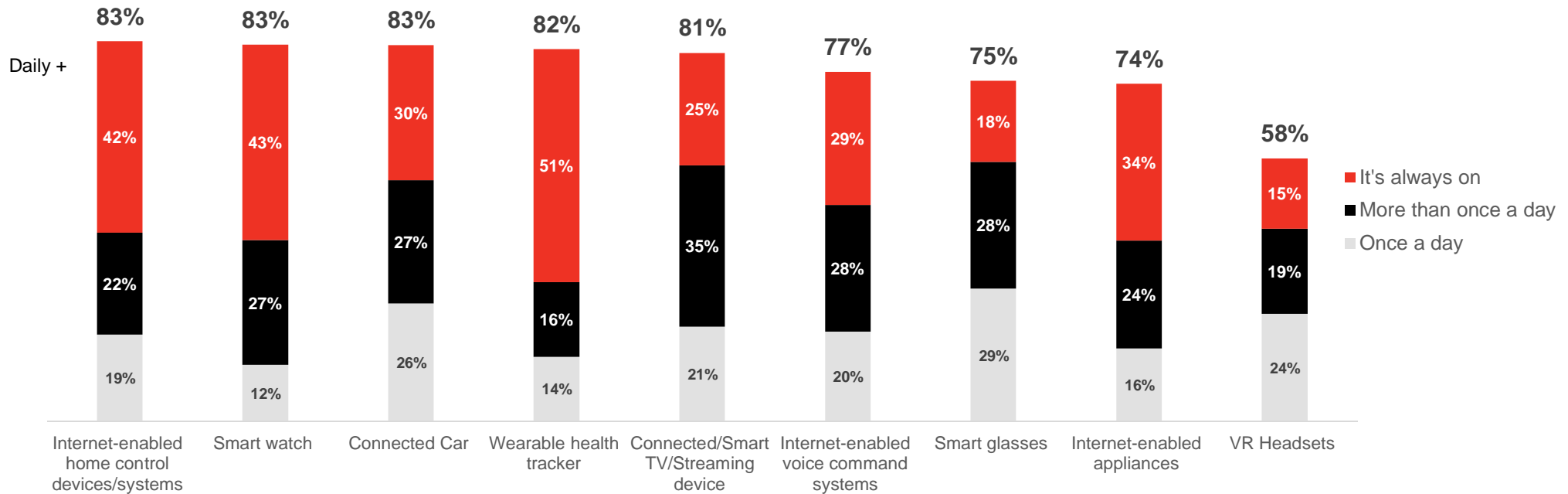
Internet-enabled appliances



Q3a Is your DEVICE currently connected to the internet?
Base: Floating - Device owner.

Wearables and Connected Home Devices are used at least once a day

Frequency Of Connected Device Use
Among device owners

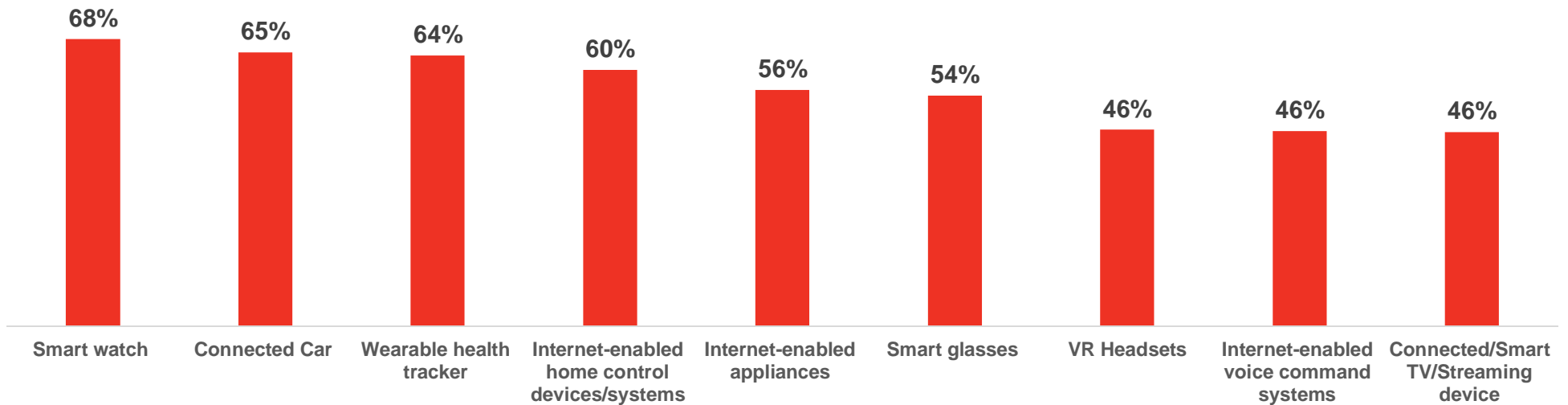


Q2f How often do you use your connected device(s)?
Base: Floating - own device.

Most connected devices are used in conjunction with a smartphone/computer/tablet on a daily basis or more frequently

- Owners of smart watches, connected cars and health trackers are more likely to connect their devices to their smartphone, computer or tablet at least once a day

Interaction Of Connected Devices With Smartphone/Computer/Tablet at Least Once a Day
Among device owners

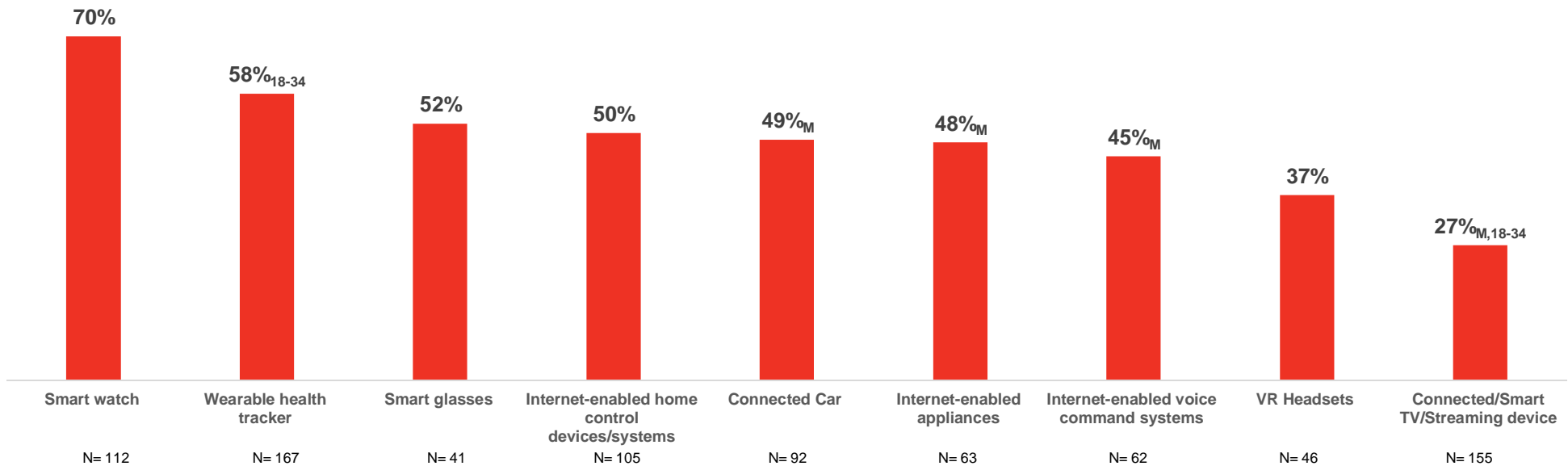


Q3. [NET: Once a day or more] How often, if ever, do you use your smartphone, computer or tablet to interact with each connected device?
Base: Floating - own device.

Most wearable device owners have received notifications about their devices on smartphones/computers/tablets

- Smart watch owners most likely to have received such cross-device notifications

Have you received connected device notifications on your smartphone, computer, or tablet?
Among device owners



Q4. Have you ever received a notification on your smartphone, tablet or computer about any of your connected devices?

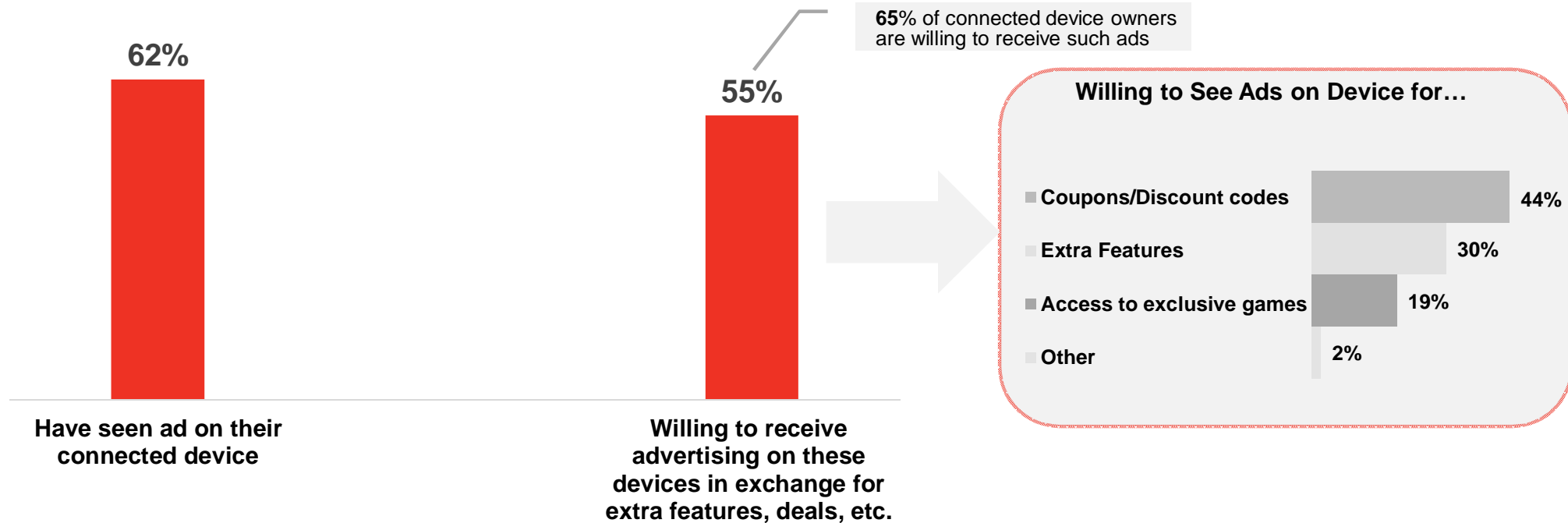
Base: Floating- Own the device.

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18-34 = more likely among 18-34 year olds, 35-54 = more likely among 18-34 year olds, 55+ = more likely among 55 year olds and older

Connected Device Advertising

Almost two-thirds (62%) of connected device owners report having seen an ad on their device

- More than half (55%) of consumers are willing to receive ads on their devices in exchange for coupons/discounts, extra features or access to exclusive games



Q5. Have you ever seen an ad on any of the following devices?
 Q7. Some internet-enabled devices might offer advertising in exchange for extra features, deals, etc. Would you be willing to receive advertising on these devices for any of the following? Base: Total
 Text next to the numbers indicates that that group over indexes on that attribute. For ex., M = more likely among men, W = more likely among women, Asian = more likely among Asians, 18-34 = more likely among 18-34 year olds, 35-54 = more likely among 18-34 year olds, 55+ = more likely among 55 year olds and older

Those willing to receive ads in exchange for coupons, extra features or games are likely to be younger, affluent

Those who are willing to receive ads skew...

Male	107
18-34	124
Married	110
With kids	132
College-educated	105
Employed full-time	116
Earn \$50K+	110

Among those who are willing to receive ads...

69% earn \$100k or more
68% are 18-34 years old

Top devices owned:

Connected/Smart TV	57%
Wearable health tracker	31%
Internet-enabled home control devices	25%
Connected car	25%

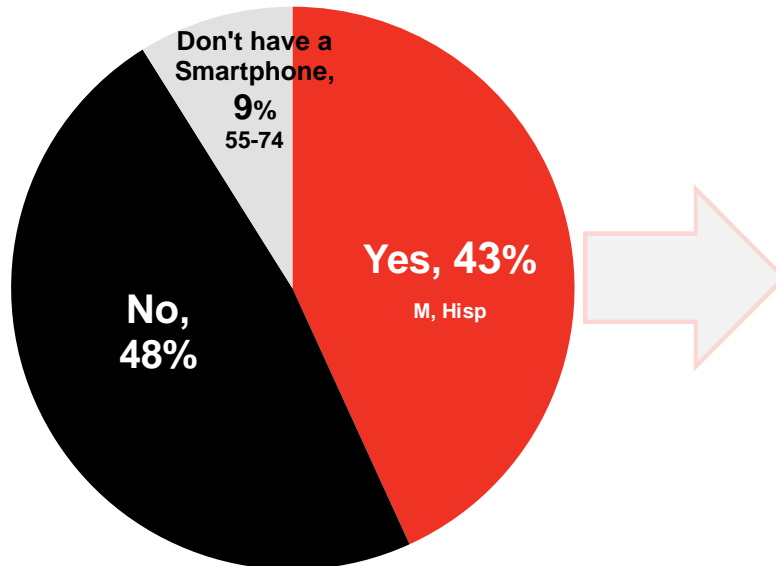
S1. What is your gender?
 S2. What is your age?
 D1. What is your marital status?
 D2. Are there any children under the age of 18 living in your household?
 D3. What is the highest level of education you have completed?
 D4. Which of these best describes your current employment status?
 D5. What is your family household income before taxes?
 Base: Q9 ≠ equal "I would rather not see advertising, n=659.

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**Interest in Other Connected
Technologies and
Future Connected Devices**

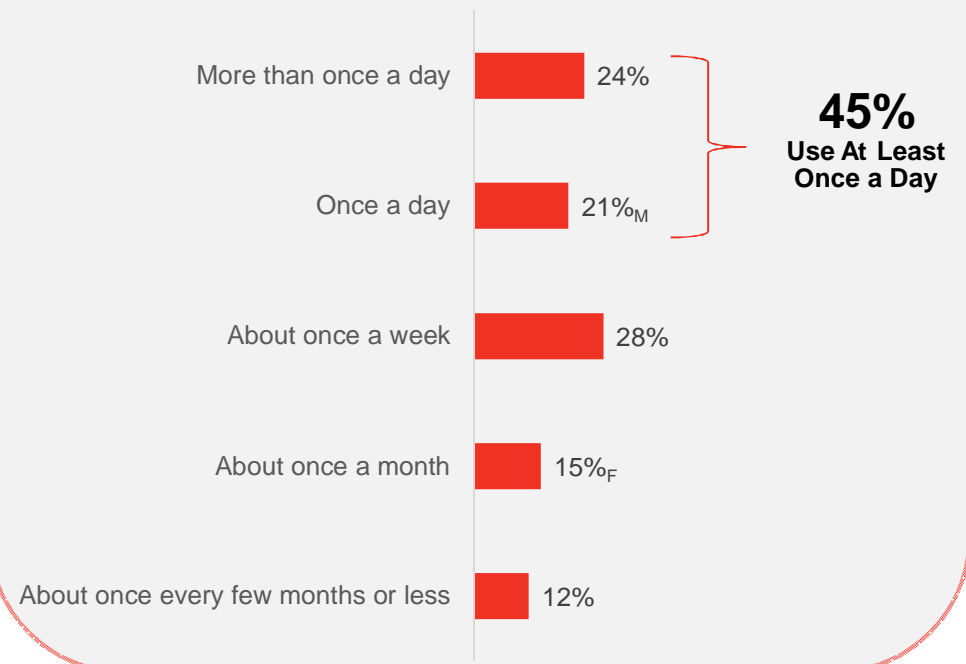
Voice-Controlled Digital Assistant: 43% Use a Voice Controlled Assistant and nearly half (45%) of them use it daily+

Use a Voice-Controlled Digital Assistant
Among Total



Use Frequency

Among Those who use a voice-controlled digital assistant



Q3b Do you ever use a voice controlled digital assistant (e.g., Siri or Alexa) on your smartphone?

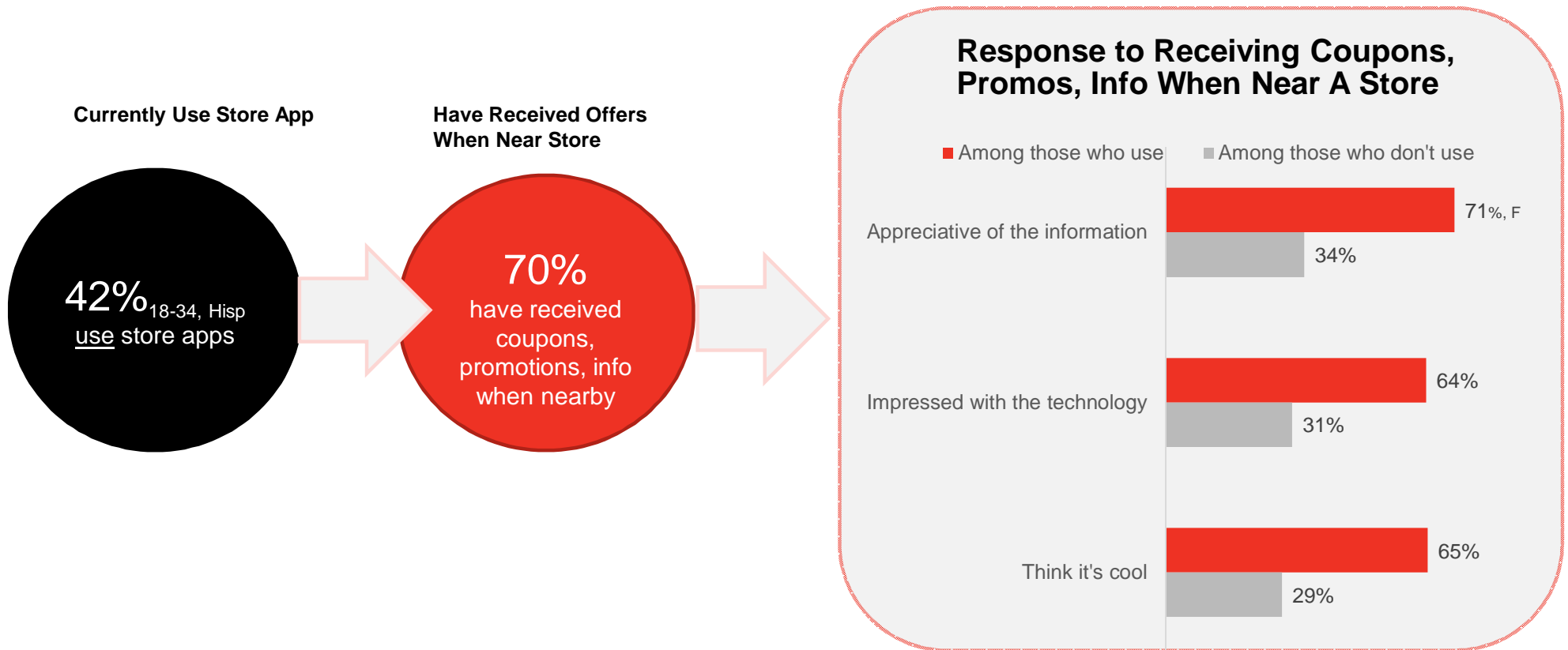
Base: Total, n=1209. US Adults 18+

Q3c How often do you use your voice controlled digital assistant (e.g., Siri or Alexa) on your smartphone? Base: Uses voice-controlled digital assistant.

Base: Uses voice-controlled digital assistant, n=522.

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Store Apps: 42% use store apps and most of them have received offers, which they are largely receptive to

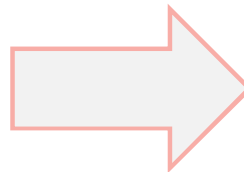


Q10. Do you currently use any such store apps (e.g., for Starbucks, Macys, American Eagle, McDonalds, or Shopkick)? Base: Total, n=1209. US Adults 18+ Q10a1. Have you ever received coupons, store promotions or info about the store when near it? Base: Use store app, n=511. Q10a2. [Top 2 Box] Please tell us how much you agree or disagree with the following statements about receiving coupons, store promotions or info about the store while you are near the store. Base: Use store app, n=511. Q10a3. [Top 2 Box] Please tell us how much you agree or disagree with the following statements describing how you would feel about receiving coupons, store promotions or info about a store while near it. Base: Don't use store app, n=698.

Store App Interest: 18% of those who don't use a store app are interested in them

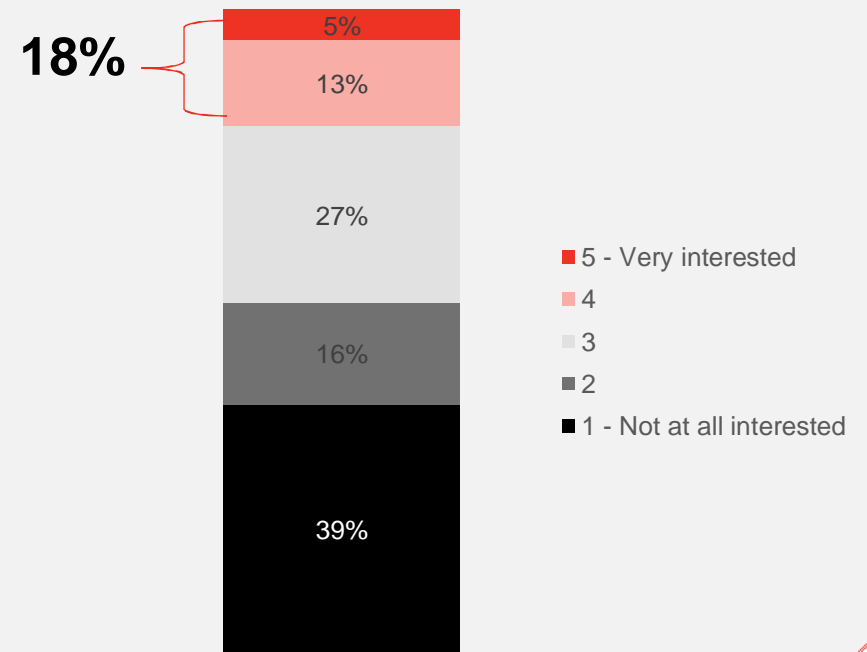
Store App Usage

Among Total



Store App Interest

Among those who don't currently use a store app



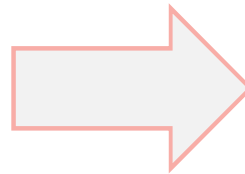
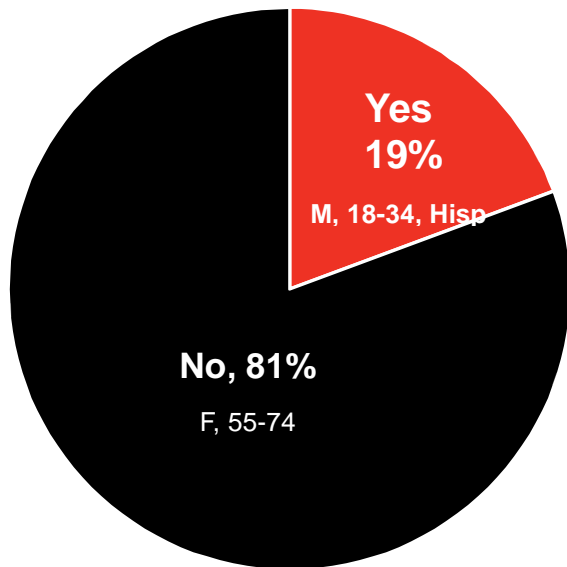
Q10 Many stores now offer apps that will send you store promotions and information when you are near or in the store. This involves you downloading an app, signing up, and the store using GPS tracking to know you are nearby. Do you currently use any such store apps (e.g., for Starbucks, Macys, American Eagle, McDonalds, or Shopkick)?

Q10a How interested would you be in signing up for a store app like this [again]? Base: Total

Smart Labels: 19% have interacted with a Smart Label and 28% who haven't are interested in doing so

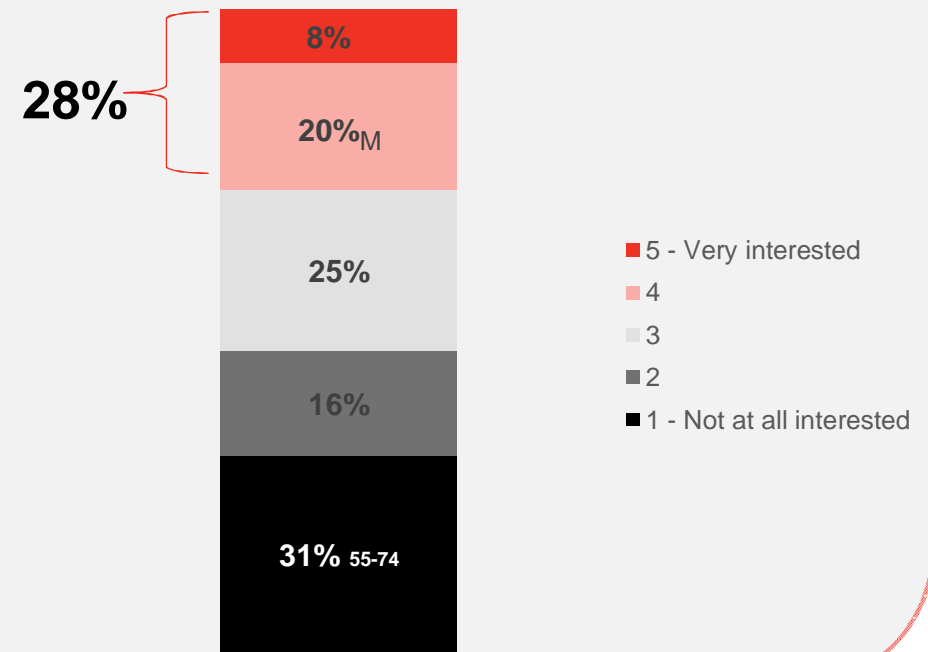
Smart Label Usage

Among Total



Smart Label Interest

Among those who haven't used smart label products



Q11 Some brands now include "smart labels" on their product packaging. For instance, scanning a beer bottle's smart label with your smartphone could give you access to online games and prizes. Have you ever used any such "smart labels"? Base: Total, n=1209. US Adults 18+

Q11a How interested would you be in scanning and interacting with a product or brand this way?

Base: Don't Use Smart Label, n=975.

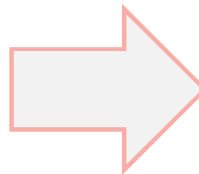
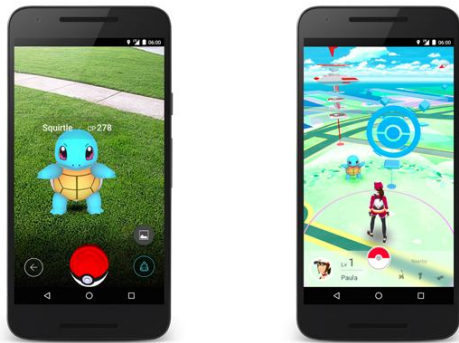
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Pokémon Go: 18% Play Pokémon Go and 66% of players are interested in a peripheral

Pokémon Go Play Among Total

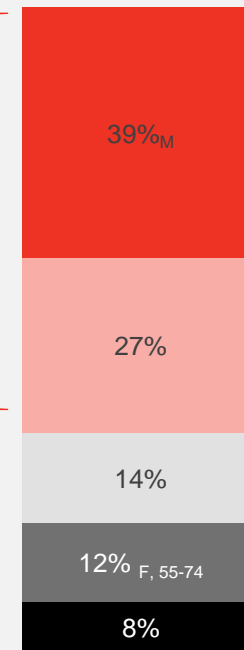
18%
M, 18-34

Yes, play Pokémon Go



Pokémon Go Peripheral Interest Among Pokémon Players

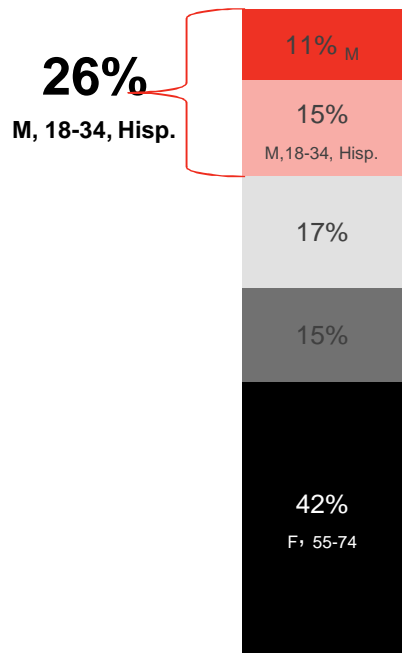
66%
Interested



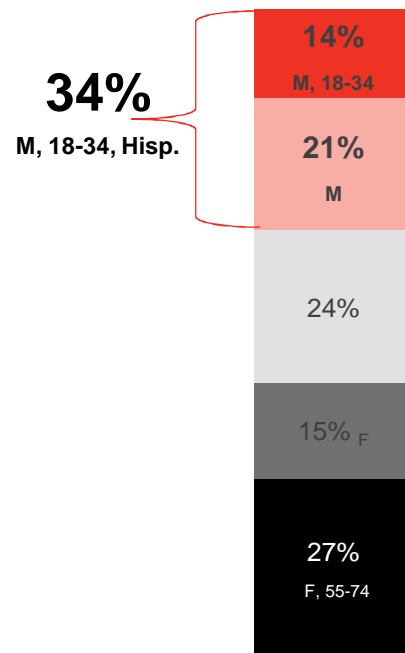
- 5 - Very interested
- 4
- 3
- 2
- 1 - Not at all interested

Breakdown of IoT innovation interest

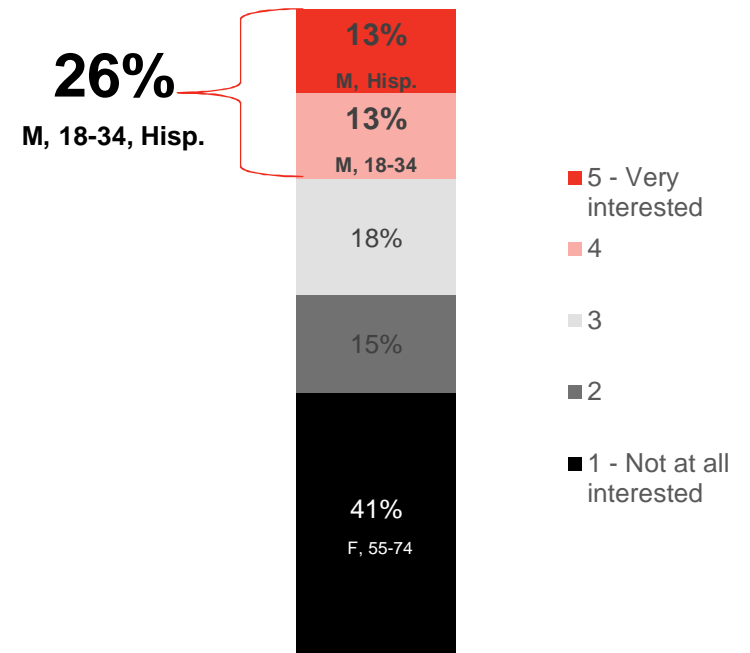
Interest in Self-Driving Car



Interest in Devices that Interact on Their Own



Interest in Interactive Clothes



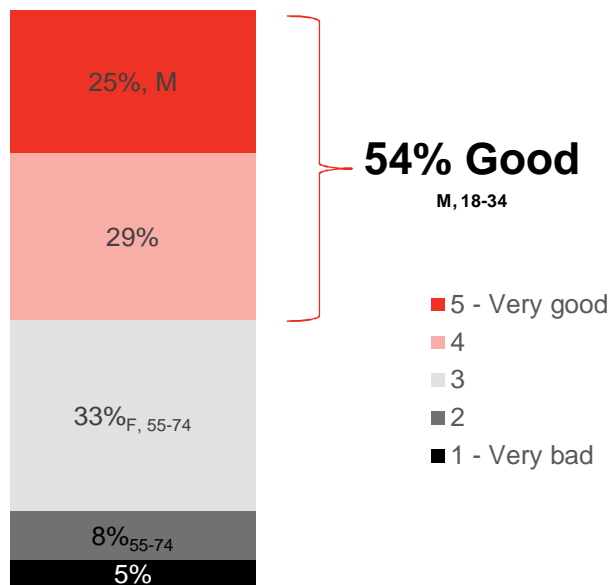
Q12 Some manufacturers are making cars that can drive themselves. These cars don't have a steering wheel, gas pedal, or brake pedal. How interested would you be in purchasing a self-driving car?
 Q13 In the future, devices may be able to share information with each other without your involvement. For instance, a wearable health tracker could let your internet-enabled thermostat know you are heading home from a run, triggering the air conditioning to turn on. How interested would you be in having devices that can interact without your involvement?
 Q14 Some manufacturers are weaving internet connectivity into fabrics. This means that you may be able to make a phone call by touching your jeans in a certain way; or that your shirt could tell you your heart rate. How interested would you be in having clothes that can interact with your devices?

Base: Total, n=1209.

Text next to the numbers indicates that that group over indexes on that attribute. For ex., M = more likely among men, W = more likely among women, Asian = more likely among Asians, 18-34 = more likely among 18-34 year olds, 35-54 = more likely among 18-34 year olds, 55+ = more likely among 55 year olds and older

A majority of consumers (54%) feel good about technology – led by younger Males

Overall Feelings About Technology
Among total



Q15. Now, thinking about all of the new technology becoming available, how do you feel about technology overall? Please use a scale from 1 to 5, where 1 means "Very bad" and 5 means "Very good." Overall, I feel this new technology is...

Q16. How much do you agree or disagree with the following statements:

Base: Total, 1209.

Text next to the numbers indicates that that group over indexes on that attribute. For ex., M = more likely among men, W = more likely among women, Asian = more likely among Asians, 18-34 = more likely among 18-34 year olds, 35-54 = more likely among 18-34 year olds, 55+ = more likely among 55 year olds and older

The Internet of Things IAB

Questions?



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