Prof. Antonio Rangel

Behavioral Economics Expert

What are Defaults?

- A default is an option pre-selected by a third party.

- Default is automatically chosen unless the consumer makes an explicit decision to select another alternative.

Assignment

Assignment 1: Evaluate the impact of Google's search defaults.

Assignment 2: Compare the impact of search defaults on mobile devices versus personal computers.

Assignment 3: Evaluate the impact of defaults on consumers' decisions regarding privacy in search.

Key Conclusions

Conclusion 1: Search engine defaults generate a sizable and robust bias towards the default.

Conclusion 2: Search engine default effects have stronger effects on mobile devices than on personal computers.

Conclusion 3: Power of defaults also affects consumers' privacy decisions in search.

Sample Primary Ballot Example

REPUBLICAN PARTY   *PARTIDO REPUBLICANO*
PRIMARY ELECTION   **OFFICIAL BALLOT**   *ELECCIÓN PRIMARIA*   *BOLETA OFICIAL*
HARDIN COUNTY, TEXAS   *CONDADO DE HARDIN, TEXAS*
March 04, 2014   *- 04 de Marzo de 2014*   Precinct   *Precinto*   1

Instruction Text:
Please use a black or blue ink pen only. Completely fill in the box provided to the left of your choice. Make no stray marks on the ballot. Do not use inks that soak through the paper.

Texto de Instrucción:
Por favor use solamente una pluma de tinta negra o azul. Llene completamente el espacio cuadrado a la izquierda de su selección. No haga marcas extraviadas. No use tintas que se pueden penetrar el papel.

Correct   Incorrect

"I am a Republican and I understand that I am ineligible to vote or participate in

Lieutenant Governor
Gobernador Teniente

☐ Jerry Patterson
☐ Todd Staples
☐ Dan Patrick
☐ David Dewhurst

Attorney General
Procurador General

☐ Ken Paxton
☐ Barry Smitherman
☐ Dan Branch

Comptroller of Public Accounts
Contralor de Cuentas Públicas

Judge, Court of Criminal Appeals, Place 3
Juez, Corte de Apelaciones Criminales, Lugar Núm. 3

☐ Bert Richardson
☐ Barbara Walther

Judge, Court of Criminal Appeals, Place 4
Juez, Corte de Apelaciones Criminales, Lugar Núm. 4

☐ Kevin Patrick Yeary
☐ Richard Dean Davis
☐ Jani Jo Wood

Judge, Court of Criminal Appeals, Place 9
Juez, Corte de Apelaciones Criminales, Lugar Núm. 9

Defaults Strongly Influence Choice

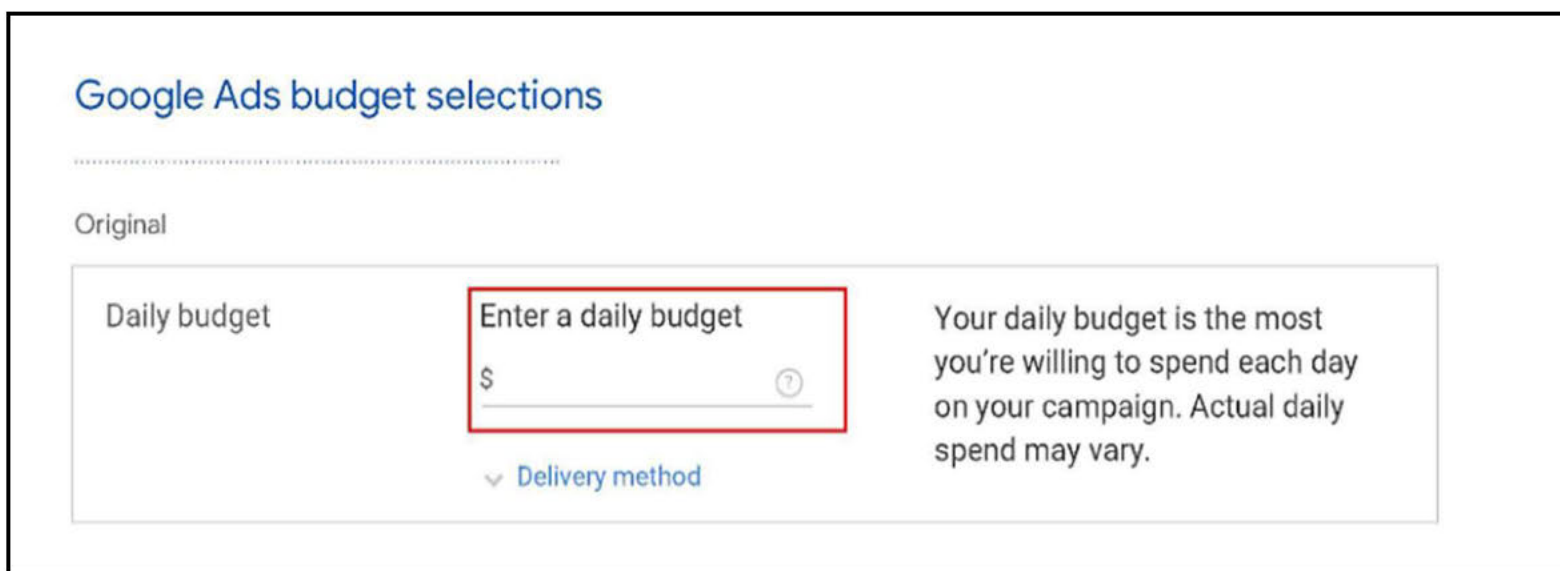**401(k) plans:** Introducing opt-in default increased participation from 37% to 86%.

End-of-life care: 77% of patients chose comfort-oriented directive when default, versus 43% when life extension was the default.

Organ Donation:

- In Austria, where citizens were registered as organ donors by default, 99% were registered donors.
- In neighboring Germany, where citizens had to affirmatively register, only 12% were registered donors.

Google's Behavioral Economics Team

Case study: Initially, advertisers entered maximum daily budgets in an interface with no default setting.

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Google's Behavioral Economics Team

Case study (cont.): Google experimented with a $10 default to increase spending among advertisers.

Google Ads budget selections

Redesigned

Daily budget	Enter a daily budget $ 10.00 ⑦
	⌄ Delivery method

Redacted

Low budget campaigns

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Google on the "Power of Defaults"

G	**2007**	Presentation to Hal Varian	"Power of defaults." "Default home page can be a powerful strategic weapon in the Search battle."
G	**2014**	Android Top Insights	"The power of default apps. Users rarely stray from pre-loaded apps provided by GMS core, carrier, and/or OEM bundle."
G	**2015**	Code Red (Apple) Update	"Our brand is in good standing among iPhone users . . . but our position is still very vulnerable if defaults were to change."
G	**2016**	Global Partnerships Search Strategy	"There's tremendous power in the default OS access points but it's pay to play. . . . There is no substitute for the default access points: we should continue to explore broad default access across all OS (including newer and emerging access points)."
G	**2017**	Email from David Tar (Google Technical Writer)	"I think default options presented (in anything from finance to gaming) are very powerful, and will probably end up being what most people choose (out of lack of knowledge about customization, or convenience.)"

Google Pays Billions for Search Defaults

Apple	Redacted (**worldwide, 2020**)
android	Redacted (**U.S.-only, 2020**)
Firefox	Redacted (**worldwide, 2021**)

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Google Apps Encounter "Power of Defaults"

2019 Google Podcasts Presentation:

Secondly, if we take another view, Apple Podcasts has amassed a majority market share on iPhones. ==There are other podcasting apps what we believe offer an equivalent or better user experience, but Apple Podcasts still has a== Redacted ==share over all other apps combined. This goes to show the power of the default.== There are many examples of other apps where a preinstalled app in premium placement is the primary driver of user. (For example, Google Photos. We also know the reverse is true - Google Maps illustrates how even a superior product with great brand recognition can struggle to gain share). We also see from consumer surveys that podcasting apps are incredibly sticky.

Even basic experiences have proven extremely sticky
Apple Podcasts remains 80%+ of iOS listening

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Google's Search Engine Defaults

Apple iPhone
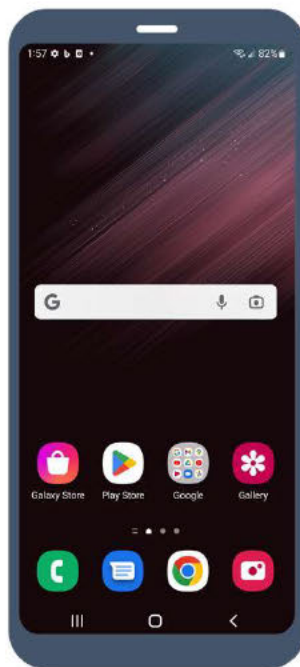
Android Phone

Firefox Browser

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Conclusion #1

- Search engine defaults generate a sizable and robust bias towards the default.

- Most search engine choice is implicitly driven by habit.

- Behavioral biases and choice friction further strengthen Google's defaults.

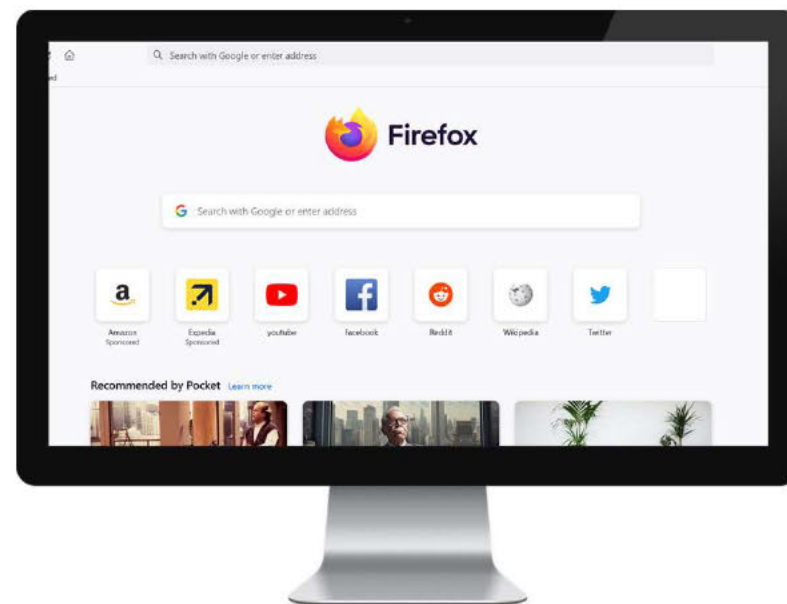# Habit & Implicit Search Engine Choice

G	**2006**	Thoughts on Google v. Microsoft (Hal Varian)	"Recommendation. **Get users addicted to our interface and tools**, particularly those where we have intellectual property protection."
G	**2015**	iOS App Switching	Listing "Habit/Regular Usage" as the #1 reason users choose Chrome, the Google Search application, and Safari.
G	**2016**	Search/Assist Presentation	Redacted Redacted "Changing behavior is hard, displacing defaults even harder."
G	**2022**	Marketing Plan	"[T]he **power of habit** drives many users to stick with Apple's Spotlight and Safari."
⌂ G	**March 23, 2022**	Former Google SVP and Neeva CEO Sridihar Ramaswamy	"People are **creatures of habit**, and if you interject yourself into a habit, good things will happen." "Most people settle on – you know, one mechanism to do things and – so what is the default within that mechanism is incredibly powerful for establishing market share."

Habits & Rare Default Changes

2005 Google Letter to Microsoft
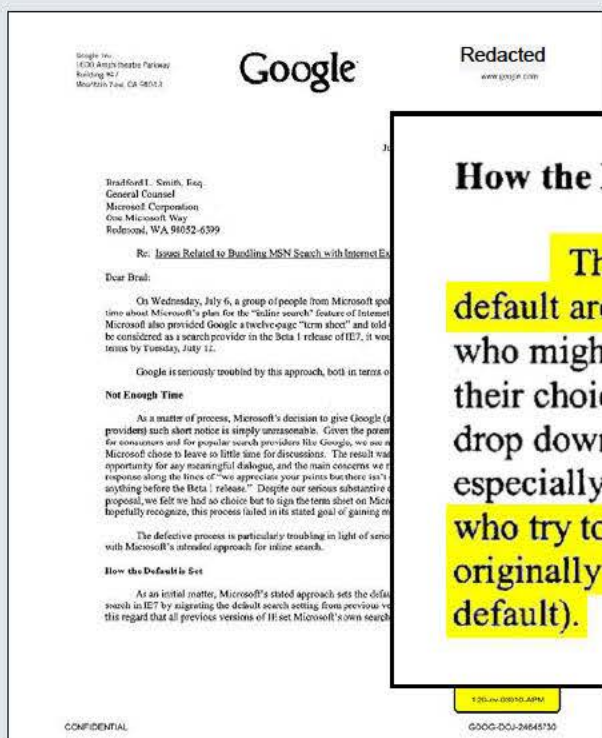
How the Default is Changed

The problems with the default setting are further compounded by how changes to the default are handled. As you know, most end users do not change defaults. And even the few who might try to make a change from the drop down menu in IE7 will be surprised to learn that their choice will revert to the original default the next time they start IE7. Making changes in the drop down menu temporary rather than permanent differs from normal convention and is especially likely to mislead and confuse end users. Undoubtedly, of the tiny fraction of end users who try to change the default, many will become frustrated and simply leave the default as originally set (in all likelihood to MSN Search in light of Microsoft's previous setting of the default).

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Cognitive Effort & Explicit Search Engine Choice

To change the search engine default, users must:

✔ Be aware there is a default search engine.

✔ Discover alternatives.

✔ Learn the steps necessary to change or evade the default.

✔ Implement the steps.

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Choice Friction Matters

Google's Behavioral Economics Team, 2021

#1: Actionability and making the best choice the easiest

Reducing friction

Seemingly small friction points in user experiences can have a dramatically disproportionate effect on whether people drop or stick. Reducing friction can also create delight and immediate value.

Status Quo Bias

Inertia is the path of least resistance. People tend to stick with the status quo, as it takes more effort to make changes. Given this, set the default option wisely.

Choice Friction Matters (cont.)

Difficult process (**friction**)

If you start by thinking that thinking is hard, that people have lots of things to do, and that each barrier in terms of time attention, and demand for thinking is 10X what you think it is — this will be a good start

For example, starting a signing process by asking people "What do you want to advertise" might create higher friction that one would imagine

If this is the case, you want to think about each step, as small as it might be, and see if there is a way to eliminate it, delay it, simplify it, default it.

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Google prevents Samsung and other Android partners from

Redacted (2017)

Redacted

Redacted

REDACTED FOR PUBLIC FILING

Google stopped Samsung from Redacted (2018)

------- DO NOT COPY -- Notification of breach - Note #3 -------

To: Andrew Hong (Redacted@samsung.com), Steve Lee (Redacted@samsung.com)
Cc: Redacted@samsung.com, Redacted@samsung.com, Redacted@samsung.com, Redacted @google.com, Redacted@google.com
From: Helen Tsao
Subject: Notice of RSA Section 2.4 violation - Notice #3

Dear Andrew and Steve,

On February 10, 2018, we discovered that Samsung used a Client ID, of which Google pays Samsung Shared Net Ad Revenue, on a Samsung device not qualified for revenue share in violation of Section 2.4 of the Google Mobile Revenue Share Agreement ("RSA") dated July 1, 2017. The details of the Device Model are below:

Redacted

Redacted

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Steps to Change the Android Search Widget

android

Replacing Google Search Widget on Android 12

1 Launch the Play Store App

2 Search for Bing in Search Bar

3 Tap on Install to Download Application

4 Tap Home Button to Exit Play Store App

5 Long Touch Home Button to Return to Home Screen

6 Tap Widget Button

7 Choose Bing in List of Widgets

8 a.) Long Press Bing Widget Style / b.) Tap Add

9 Long Press Google Widget

10 Tap Remove

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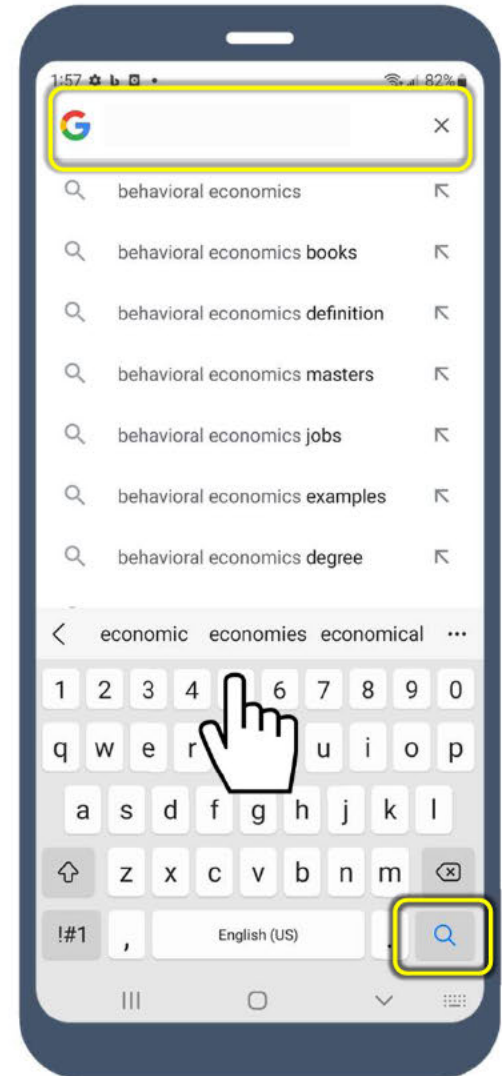
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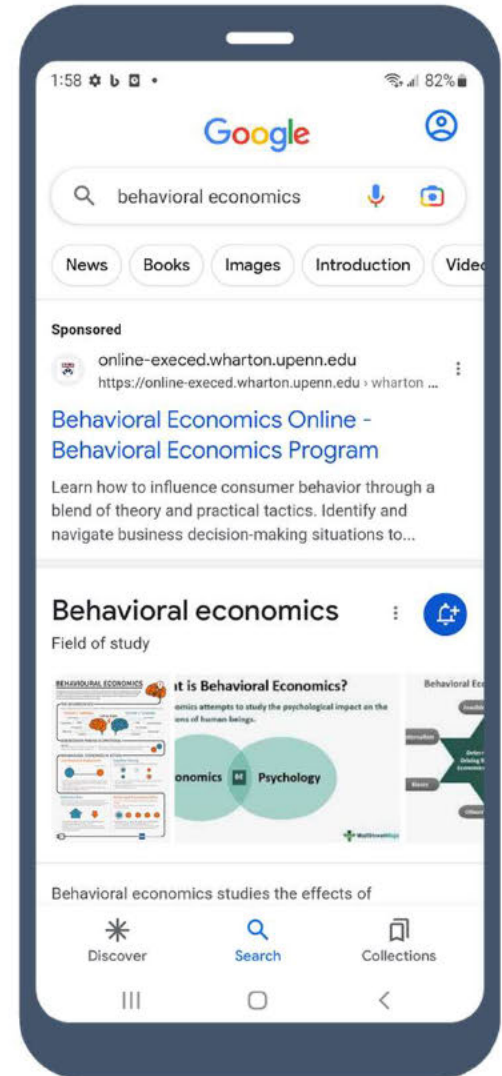
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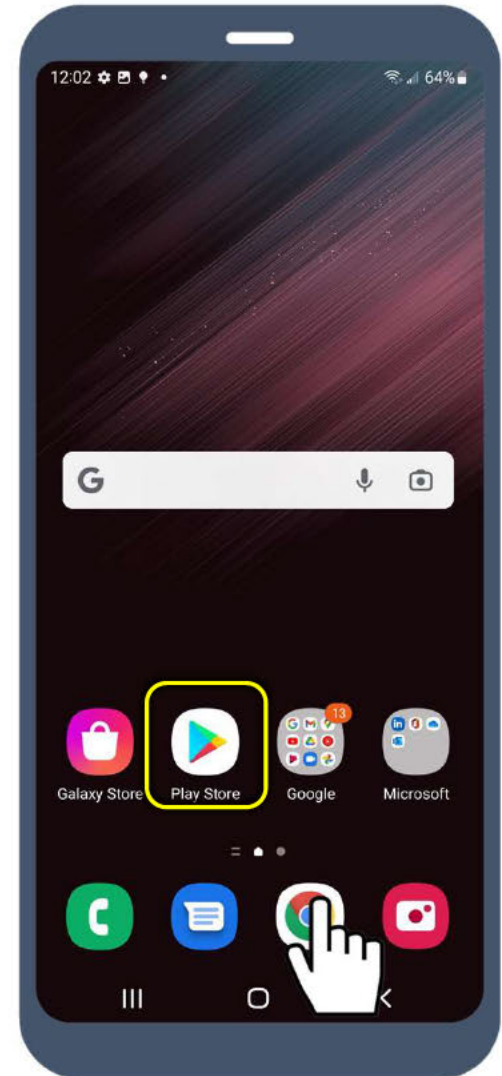
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10   Tap Remove

REDACTED FOR PUBLIC FILING

android

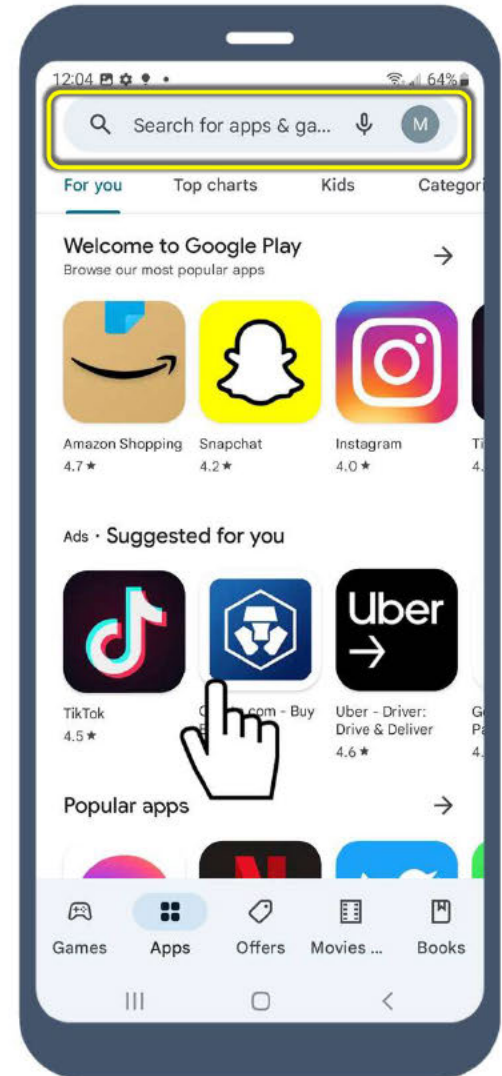## Replacing Google Search Widget on Android 12

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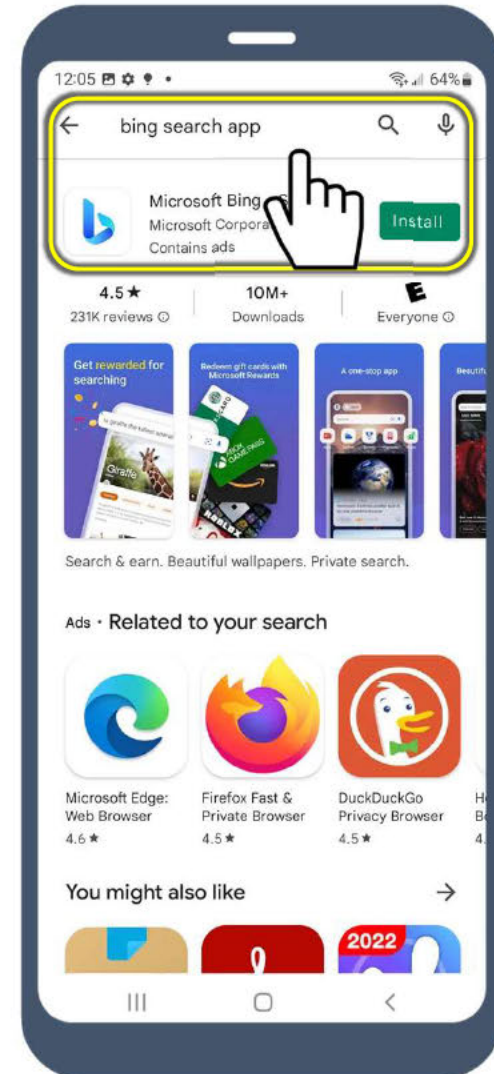**REDACTED FOR PUBLIC FILING**

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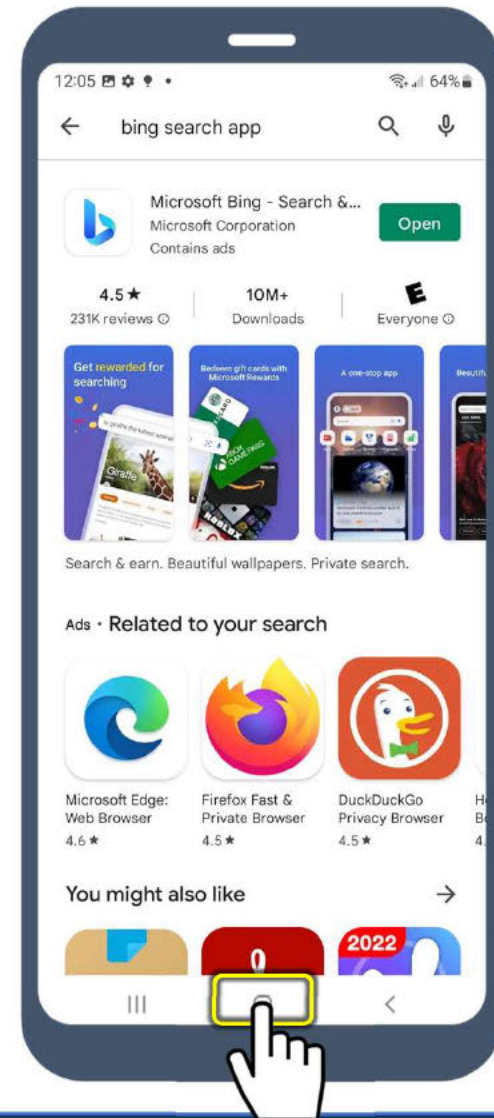
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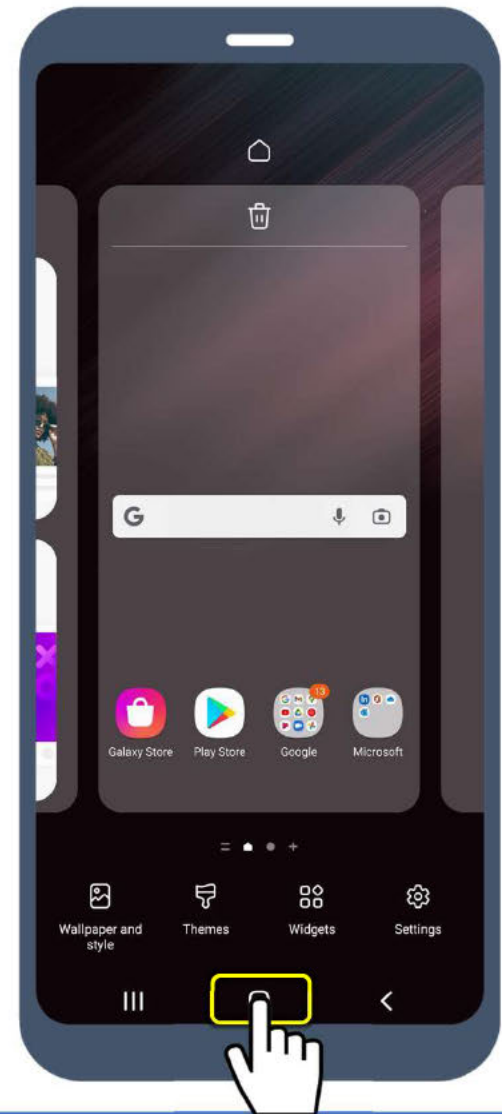
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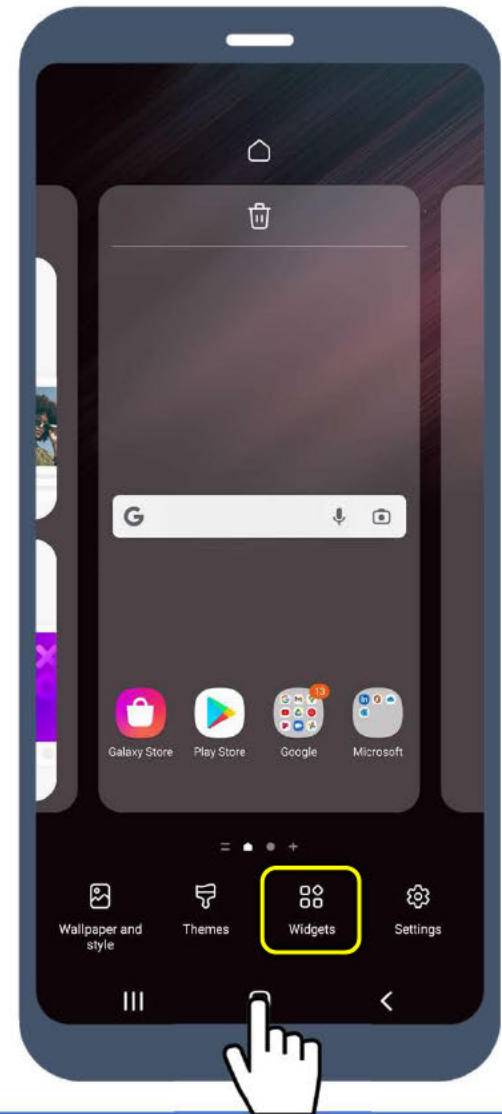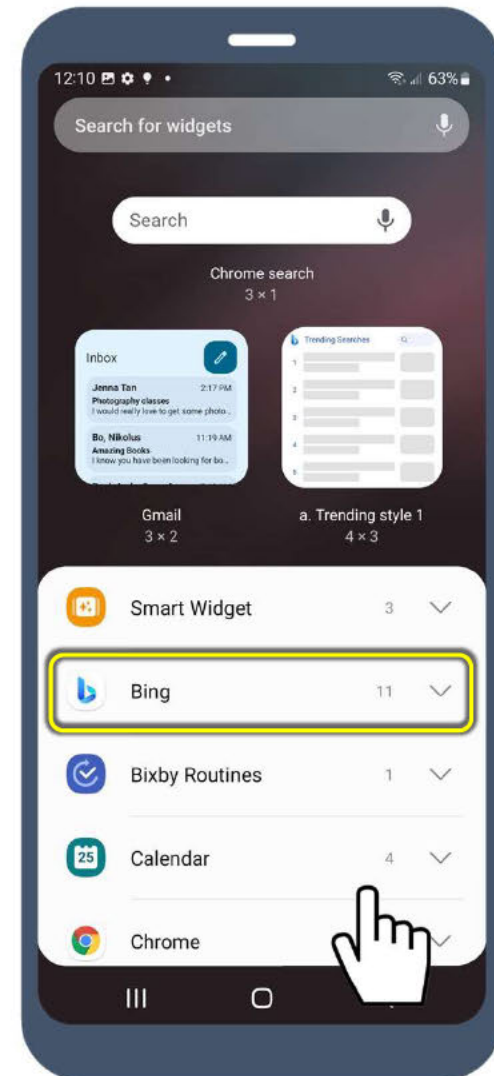
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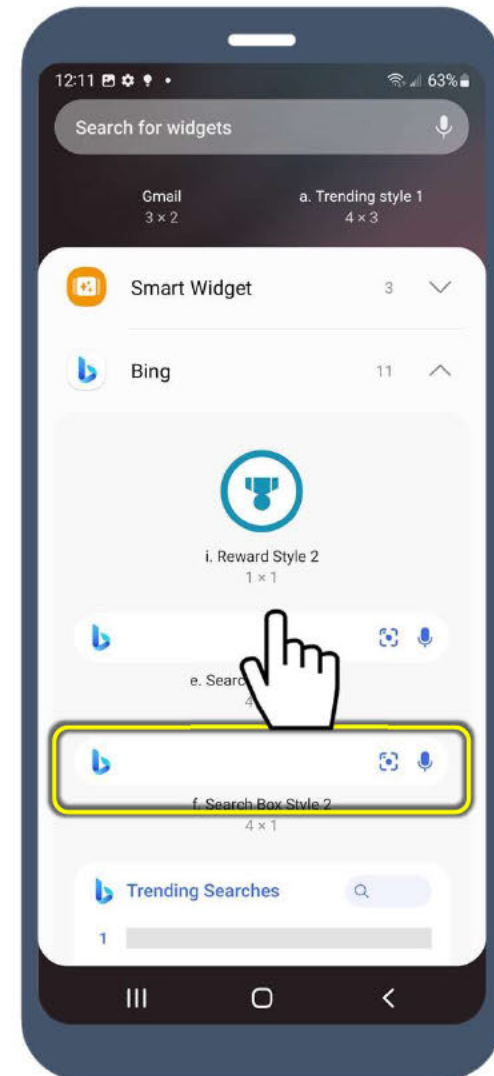
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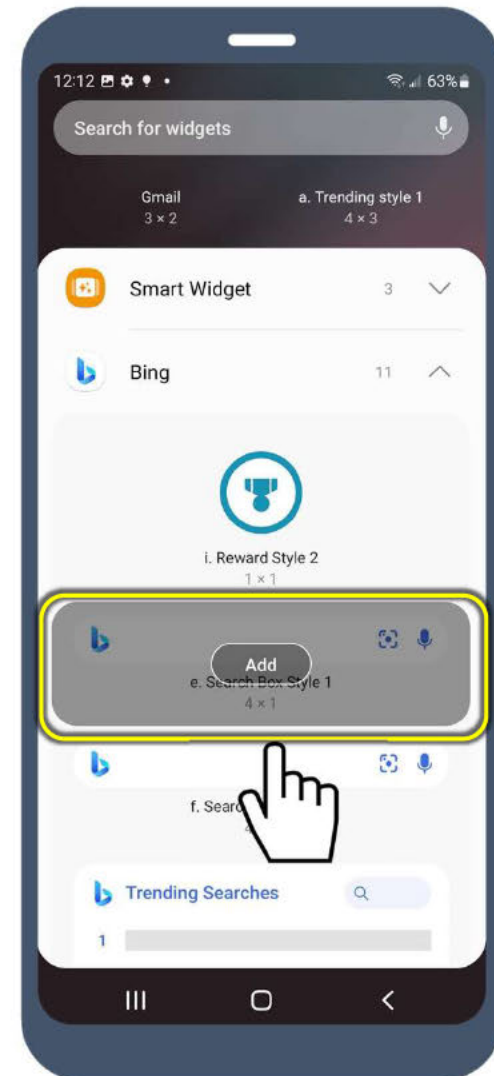

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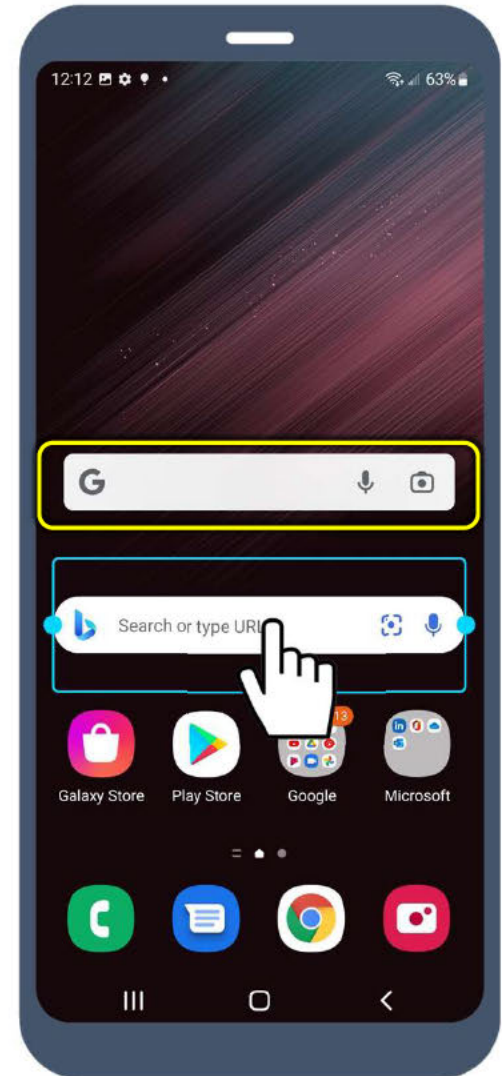| 1 | Launch the Play Store App |
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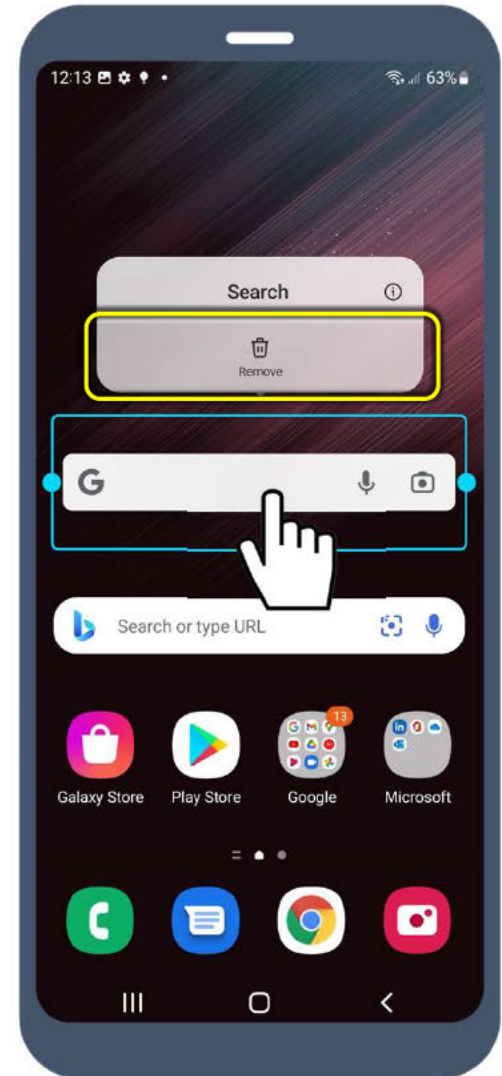
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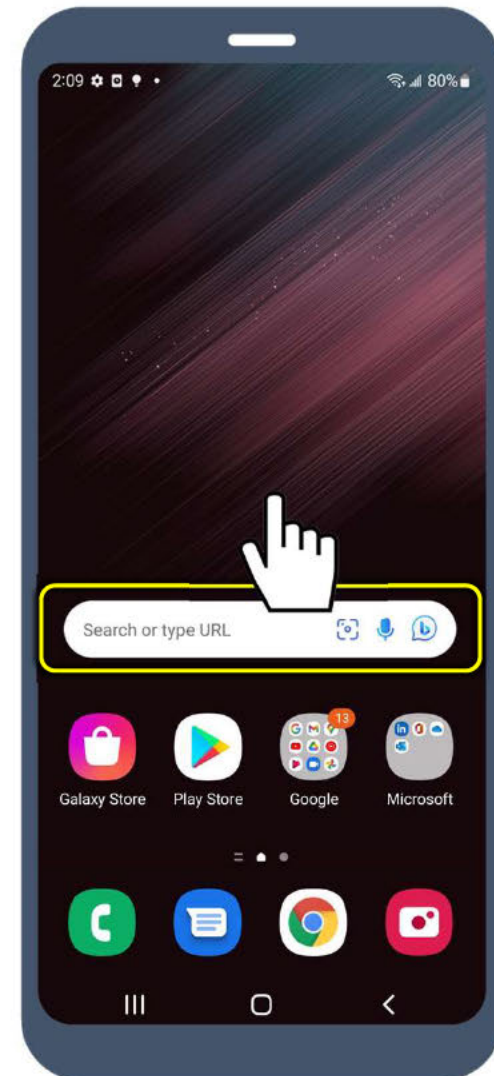
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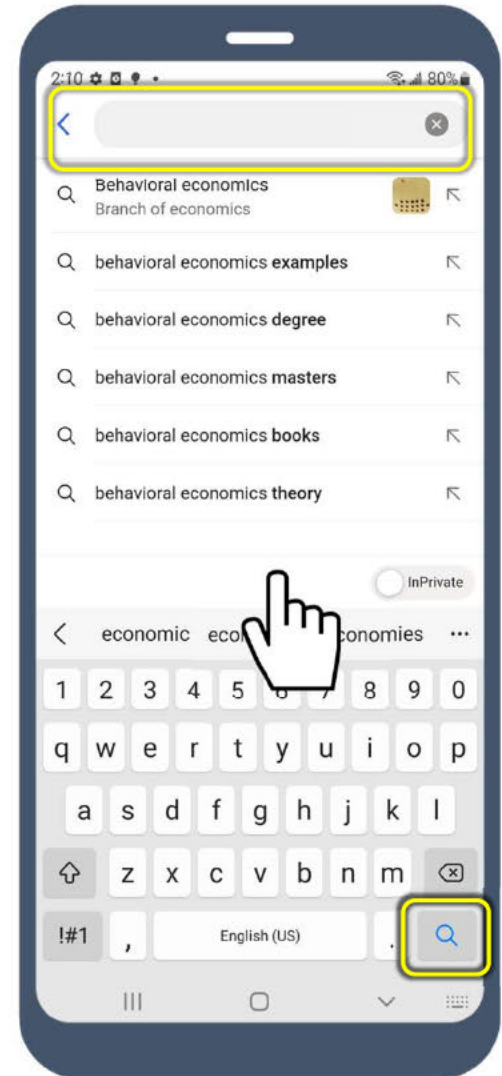
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android 🤖   *Searching with Bing*

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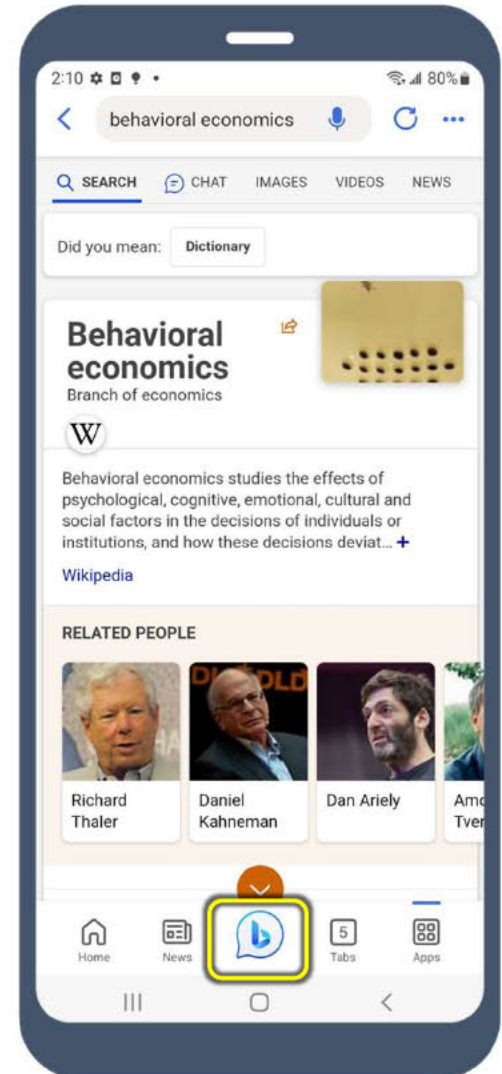10 ▷ Tap Remove

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Market Evidence: Mobile

Mobile device examples of sizeable default effects:

	Apple Maps Default Switch
	U.S. Tablet Comparison
	Russian Choice Screen

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Mobile (iOS): 2012 Apple Maps Default Switch

Based on GMM Usage Loss Following Apple Maps Launch (2012):

Redacted

Redacted
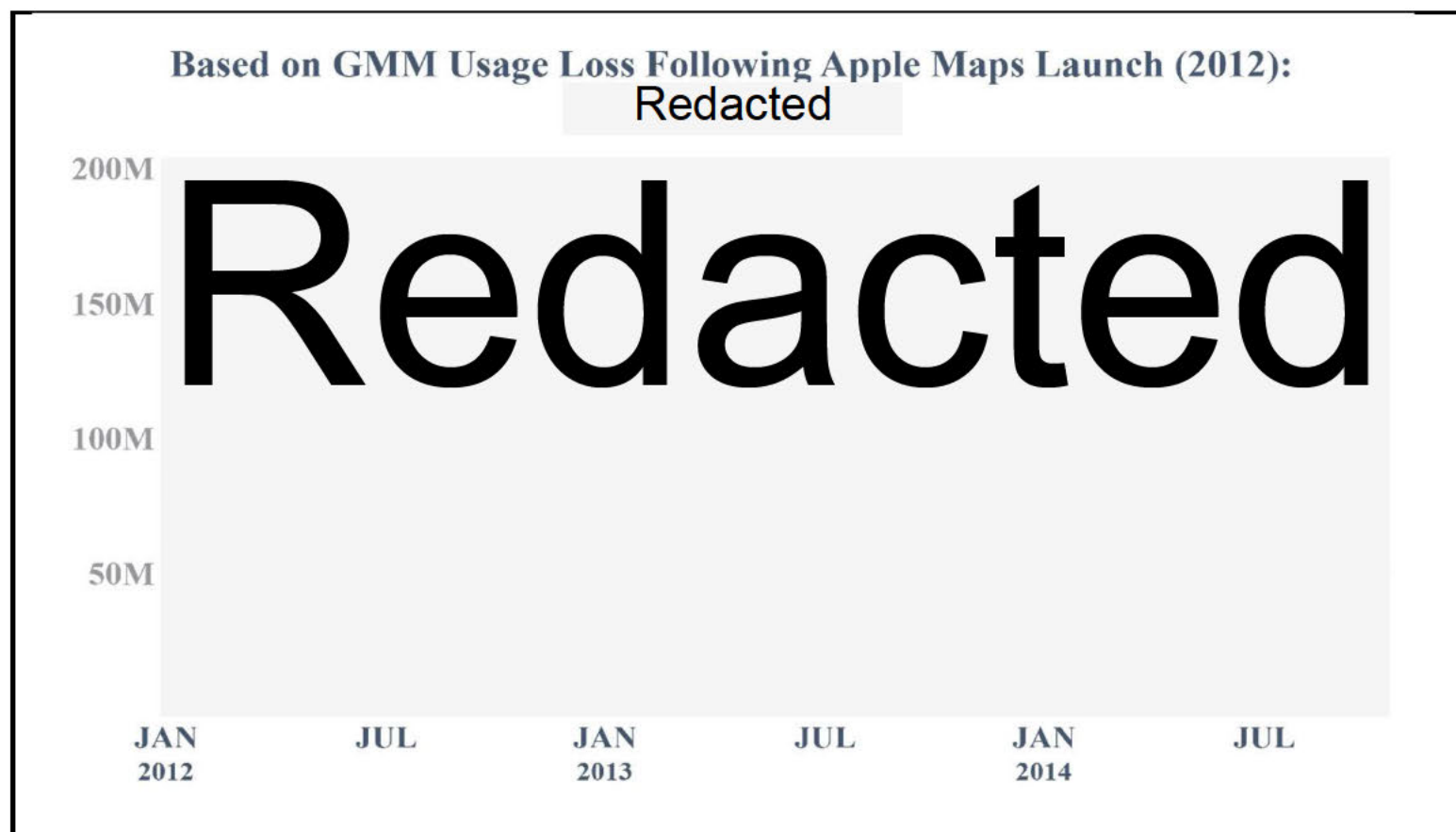
Mobile (iOS): 2012 Apple Maps Default Switch

- Apple Maps default became the dominant iPhone maps application despite quality problems.

  "Google Maps illustrates how even a superior product with great brand recognition can struggle to gain market share" against default option.

- Google uses the Apple Maps episode to model expected revenue loss on iPhones and iPads, in the event Apple were to switch the Safari search default.

Mobile (iOS): Google "Code Red" Projections

Redacted

Redacted

ATTORNEY CLIENT PRIVILEGED

Google

What Would Apple Do?

Search & Ads Perspective

January 2021

PRIVILEGED & CONFIDENTIAL

Redacted

Mobile: U.S. Tablet Comparison

amazon fire

Default in **Silk** Browser: **b Bing**

Redacted

Redacted **Google**

Redacted

b Bing

iPad

Default in **Safari** Browser: **Google**

Redacted

b Bing Redacted

Redacted

Google

2017 Russia Choice Screen: Android Mobile Phones

Google's Russia Search Share on Android Devices

Russian Choice Screen Introduced

Redacted

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%

2015   2016   2017   2018   2019   2020   2021

Source: Yandex Radar
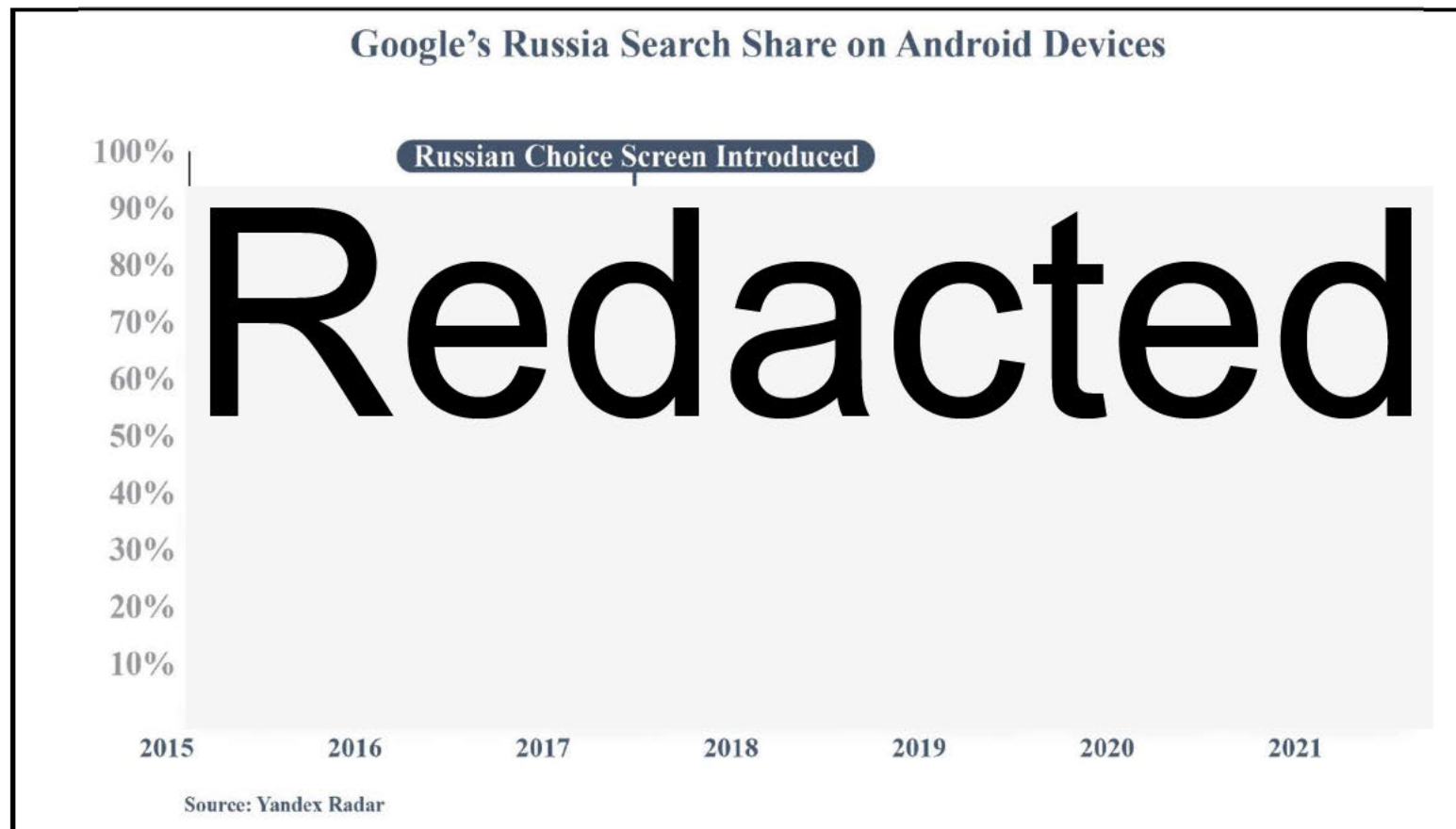
2017 Russia Choice Screen: Across Devices
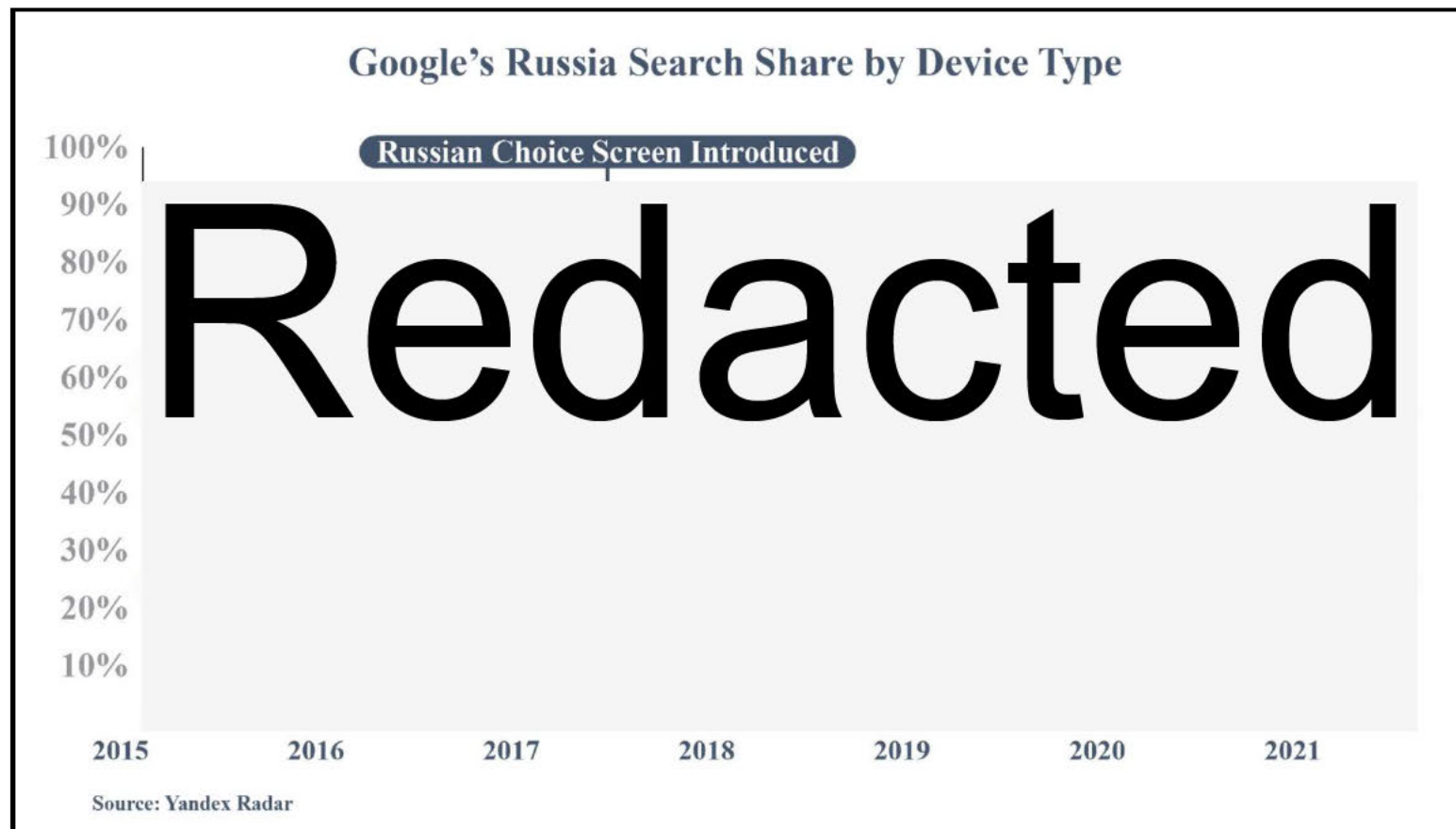
Google's Russia Search Share by Device Type

Russian Choice Screen Introduced

Redacted

	100%						
90%							
80%							
70%							
60%							
50%							
40%							
30%							
20%							
10%							

| 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |

Source: Yandex Radar

Behavioral Economics of Defaults

Status-quo bias

"Defaults: People tend to stick with the status quo, as it takes more effort to make changes. Given this, set the default option wisely."

"When the decision is unclear, people go with the default."

Loss Aversion

"When making decisions big and small, people tend to overwhelmingly pick the default option. . . . Deviating from the default induces loss aversion . . ."

App Stores – Google Documents

Redacted search is "antithetical" to how people think about apps --- people don't necessarily want to go back and open a separate thing to search

Led by famed economist Redacted our team of behavior experts work to transform Google's product & marketing strategy by applying the principles of behavioral economics (BE) like...

Anchoring
Building Trust
Choice Overload
Concreteness
Deadlines
Decoy
Defaults
Effort
Endowment Effect
Extrinsic Motivation
Financial Norms
Forced Choice
Framing
Free
Fresh Start
Friction
Goal Gradient Effect
Hyperbolic Discounting
Identifiable Victim
IKEA Effect
Incentives
Incompleteness
Information Avoidance
Intrinsic Motivation
Loss Aversion
Mental Accounting
Negative Social Proof
Pain of Paying
Peak-End Rule
Pre-Commitment
Pricing
Progress
Relativity
Social Norms
Social Proof
Sunk Costs

Google Irrational Lab
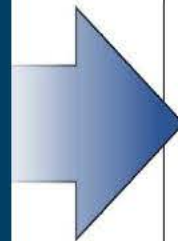
- cross functional engineers/product marketing/business team
- fast iteration of experimentation
- search app on iOS is a priority
- general goal: grow mobile at google

Redac search is "antithetical" to how people think about apps --- people don't necessarily want to go back and open a separate thing to search

Redacte experience as new iPhone user
- no google apps pre-installed
  - all apple apps, covering most needs
- many things you can do with google apps don't require sign-in
  - gmail may be an exception to this
- 81% of safari search is coming from the safari omnibox
  - Redac wants to know: from people who use safari, how many do anything except search via the safari omnibox?
  - switching away from that will be very difficult
  - 17% use the google homepage
  - possibly some of this is "bookmarking" google via an icon

Redacted google docs forcefully sent her to the google docs app, got her to download

Approaches to promotion
- push-up banner: promote google app or chrome app on google.com
  - do it for people who use chrome on desktop, and don't already have the app

Redac two approaches
- content
  - loss aversion, social proof, etc.
- context
  - possibly more promising: moment of new phone, etc.

Redac
- nice to create better messages, essentially just trying to hit the value prop of the google app
  - best case, lots of people won't want it
  - needs a different app to really work
- what is the non-mobile use that will promote the mobile use?
  - if you just fight apple on mobile, you will lose
  - what is laptop use that reinforces mobile use?
    - do things in the browser on gmail that makes you feel your mobile experience is subpar

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App Stores – Third Party Testimony

Mitchell Baker
CEO, Mozilla

"[M]erely having an app in the app store is a very difficult way to compete with the preloaded defaults . . . . Because each person who gets that phone has to make a conscious decision to go through a lot of work to get to your product."

Mobile (Android): European Choice Screen

	Google's Pre-Choice Screen Android Market Share	Google's Choice Screen Selection Share (Sept–Dec. 2021)	Difference
United Kingdom	Redacted	Redacted	Redacted
France	Redacted	Redacted	Redacted
Germany	Redacted	Redacted	Redacted
Switzerland	Redacted	Redacted	Redacted
Spain	Redacted	Redacted	Redacted

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European Choice Screen & Brand Recognition

October 2019 email
Re: Choice Screen in Search Forecasts

Redacted The reason the financial impact is not shifting based on the placement of Google in the choice screen is because the assumptions we used in the model are based on brand recognition (using queries as a proxy) - considering this is what the assumption is meant to capture, the position wouldn't matter as much as the recognition would. There could be benefits to having it show up first (first thing a user sees) or possibly last (so it's easier to click from where your thumb normally is) but we've given this a bit of thought and, given the unknowns, the current assumption is likely unchanged by position.

Separately for RU, there was a choice screen there. However, we think this would not be a good comparable because Yandex has a much higher presence in RU than Non-Google search engines have in the EEA. Ultimately, it's a similar choice screen process, but in an extremely different competitive landscape that would not be close to EEA.

Conclusion #2

Search engine defaults have stronger effects on mobile devices than on personal computers.

Google Agrees Defaults are More Powerful in Mobile

G	**2016**	Search Finance Team	Redacted
G	**2016**	Apple scenarios	"Mobile Defaults: Defaults have more prominence in mobile due to screen size and UI."
G	**2018**	iOS Search Strategy	"People are much less likely to change default search engine on mobile."
G	**2021**	What Would Apple Do?	Redacted

Source: UPX 84, at Bates 728; UPX 142, at Bates 886; UPX 139, at Bates 119; UPX 148, at Bates 826

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Third-Party Testimony: Mobile v. PCs

Rik van der Kooi
Corporate VP, Microsoft

"On a mobile platform more than anywhere else, even more than on the PC, default is the only thing that matters."

Market Evidence: Personal Computers

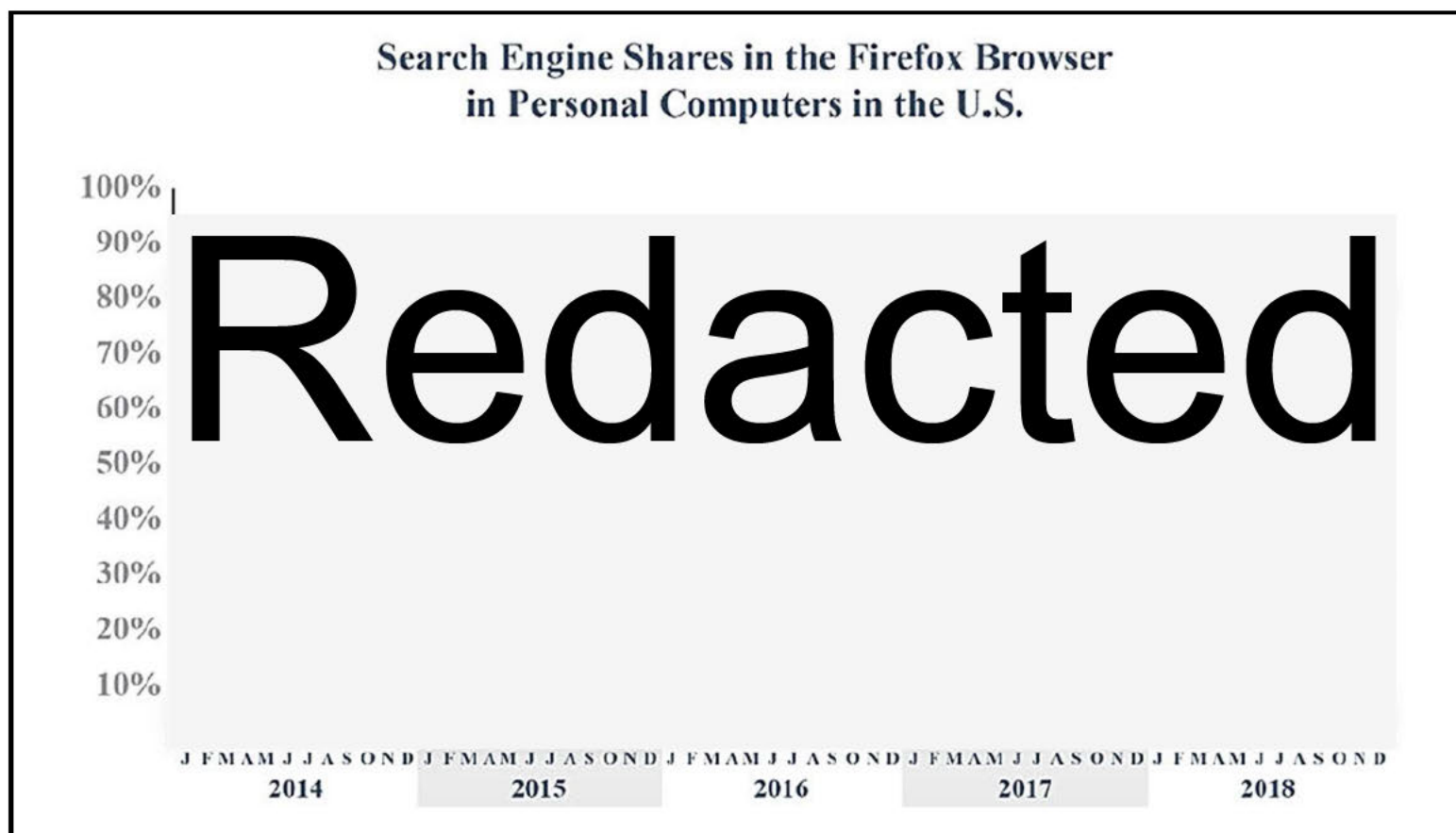**Personal computer examples** of sizeable default effects:
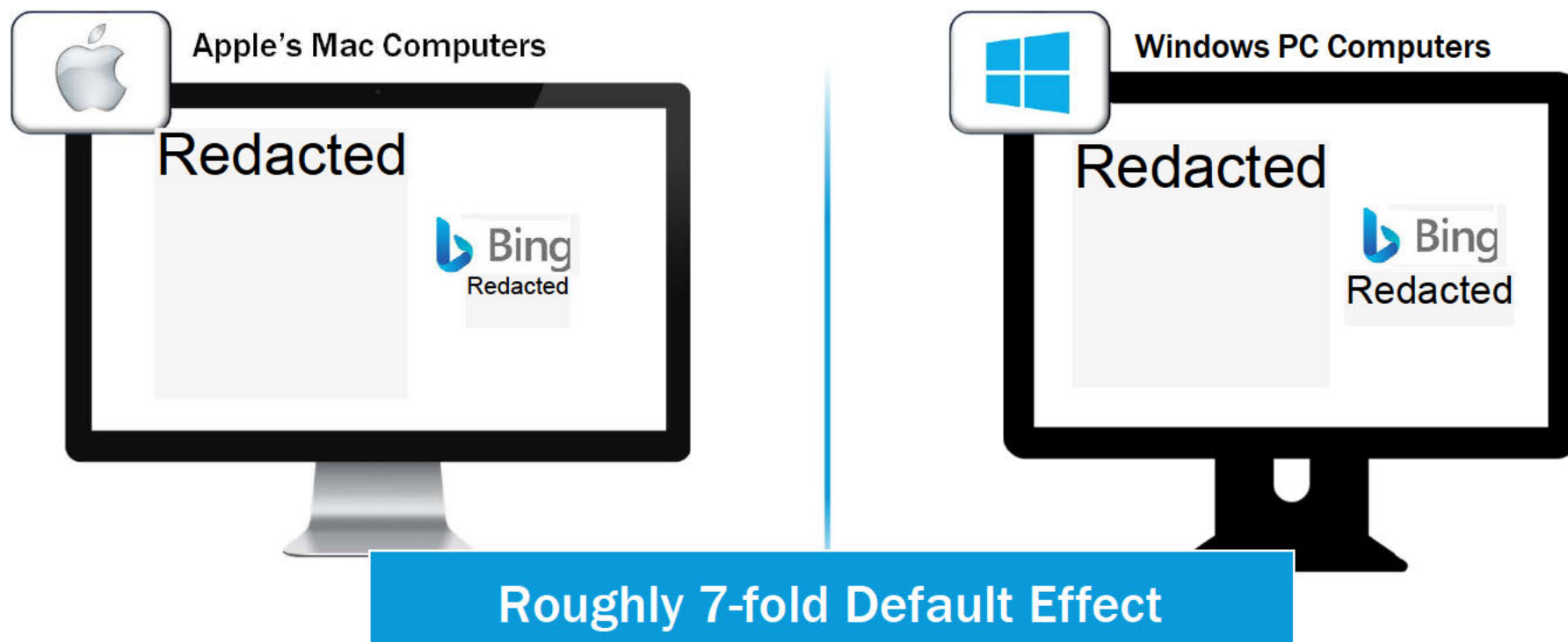
Firefox Browser Default Switch

Windows PC Search Shares

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PCs: 2014 & 2017 Firefox Default Switches

Search Engine Shares in the Firefox Browser
in Personal Computers in the U.S.

PCs: Default Effects Across Operating Systems

Apple's Mac Computers

Redacted

Bing
Redacted

Windows PC Computers

Redacted

Bing
Redacted

Roughly 7-fold Default Effect

Conclusion #3

- Defaults bias consumers' privacy decisions in search.

- Google's default privacy settings present significant choice friction for users who may prefer less data collection.

Privacy-Focused Search Engines & Defaults

Redacted

DuckDuckGo

July 2020 email from Brave Browser VP (Jan Piotrowski) to Yahoo Search VP (Nate Weinstein):

As for DDG, it's currently default in 4 geos: Germany, Ireland, Australia, and New Zealand. Although we don't track/identify our users, we have recently started anonymously sampling browsers so that we have some limited aggregated data to analyze. The data is very clear: default is sticky and very powerful. From these anonymous data sets, we see that the default (DDG in these geos) remains default on at least [Redacted] of machines (in some of those geos, significantly higher). This data is corroborated by what we're seeing with Qwant, which we have set as default in France and is seeing similarly high usage. We'd love to go to market with a strong message of partnership between Yahoo/OneSearch & Brave with Yahoo/OneSearch as default and see what we can do.

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Apple App-Tracking Prompts

- In April 2021, Apple introduced choice screen for data tracking by applications.

- "Don't Allow" selected by 80%+ after one year.

- Removal of tracking default cost Facebook roughly $10 billion.

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Choice Friction & Google Privacy Settings

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Choice Friction & Google Privacy Settings

Attorney-client product

Private Searching on Google

Prep for product council, June 2019

Redacted

Redacted

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Key Conclusions

Conclusion 1: Search engine defaults generate a sizable and robust bias towards the default.

Conclusion 2: Search engine default effects have stronger effects on mobile devices than on personal computers.

Conclusion 3: Power of defaults also affects consumers' privacy decisions in search.