

Buttons & Gestures

A study to better understand how people use touch interfaces

Beginning

System navigation



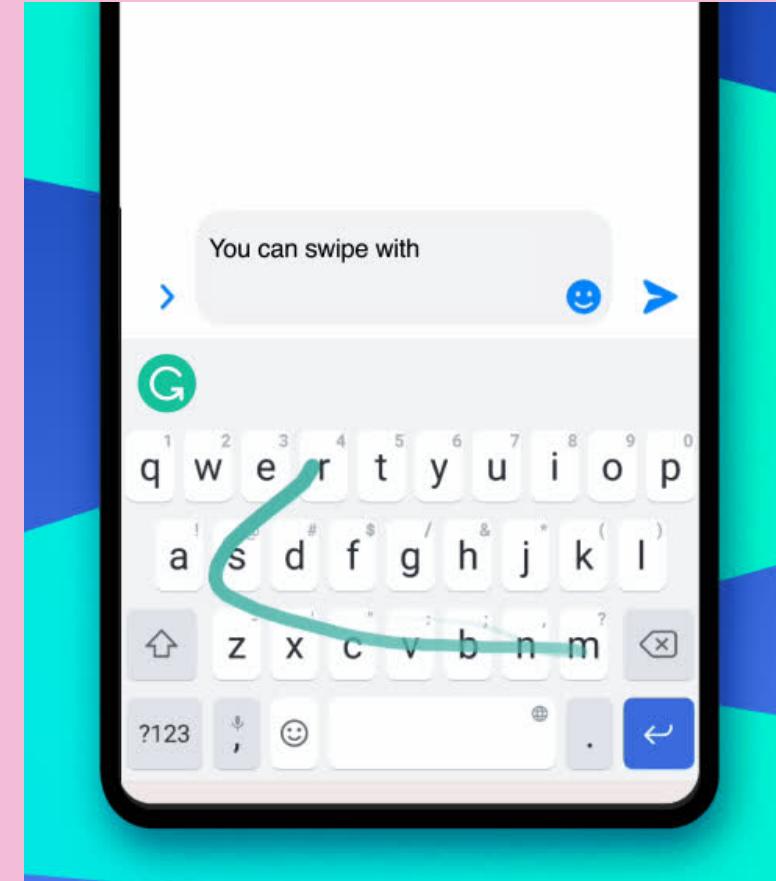
Gesture navigation

To go Home, swipe up from the bottom of the screen. To switch apps, swipe up from the bottom, hold, then release. To go back, swipe from either the left or right edge.



3-button navigation

Go back, Home, and switch apps with buttons at the bottom of your screen.

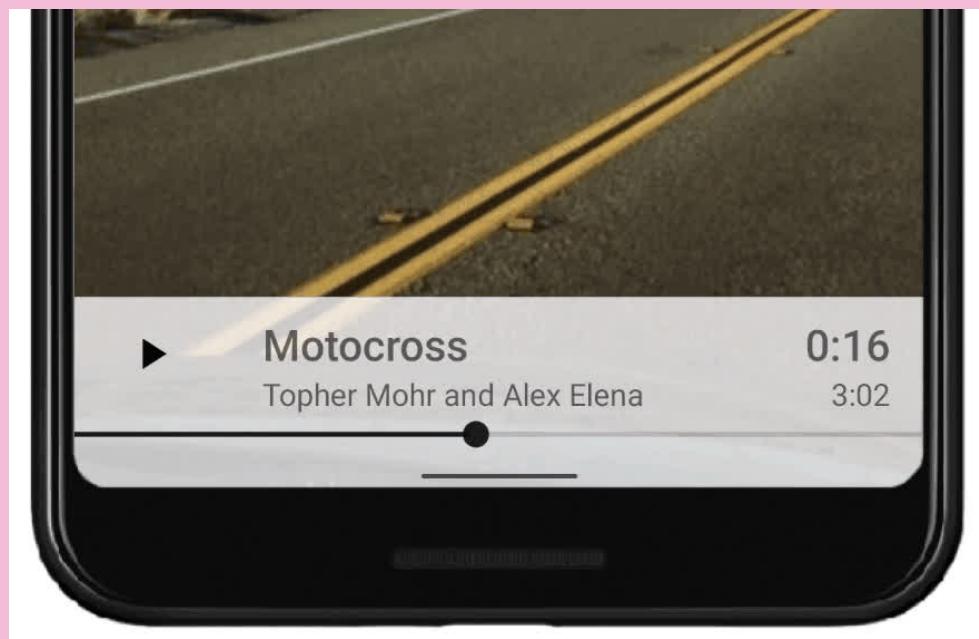


PALM SWIPE TO CAPTURE

ON

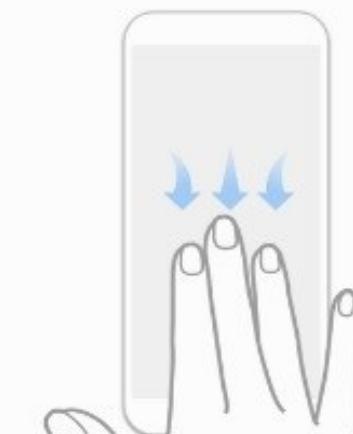


Take a screenshot by swiping the edge of your hand across the screen while keeping in contact with it.



Three-finger screenshot

Swipe down on the screen with three fingers to capture a screenshot



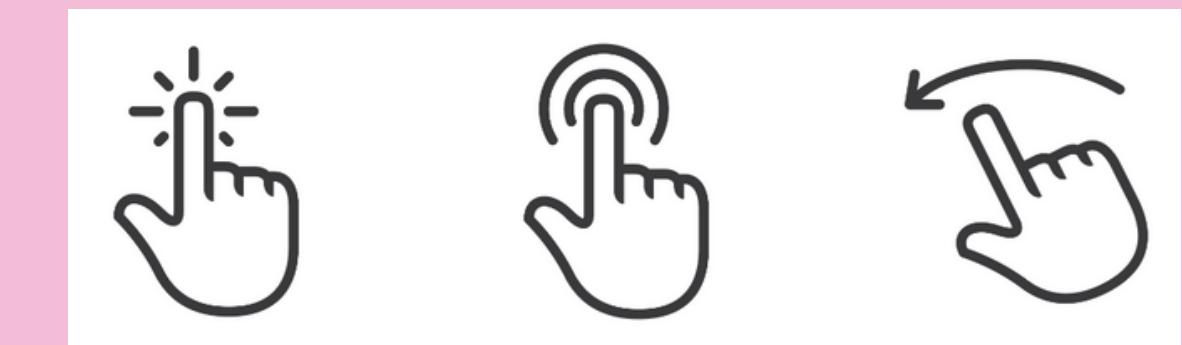
 Barnesy
@barnesyy22 · Follow

Can someone explain how when you get a call on an iPhone sometimes you can slide to answer and others you can hit red or green????

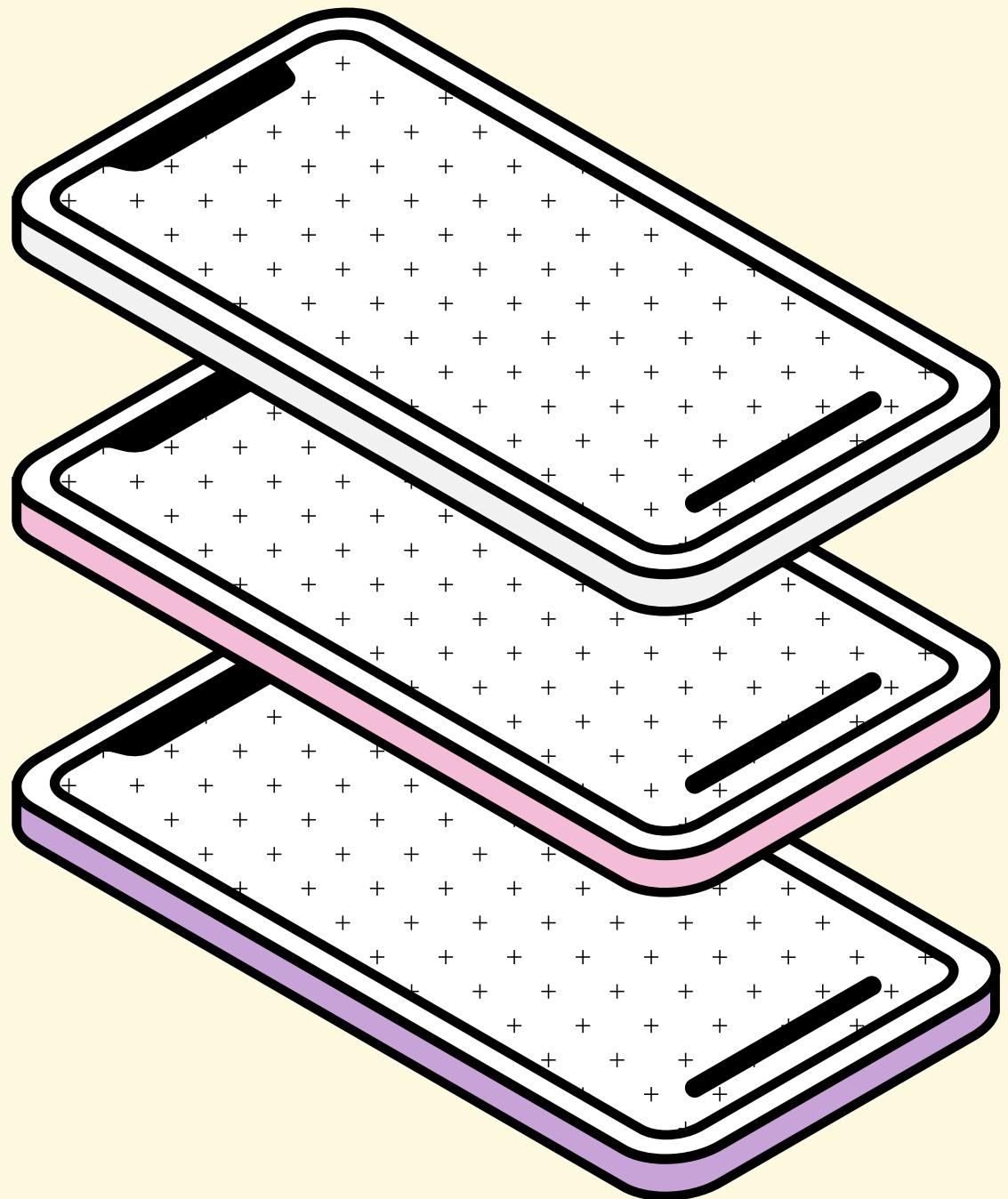
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Motivation

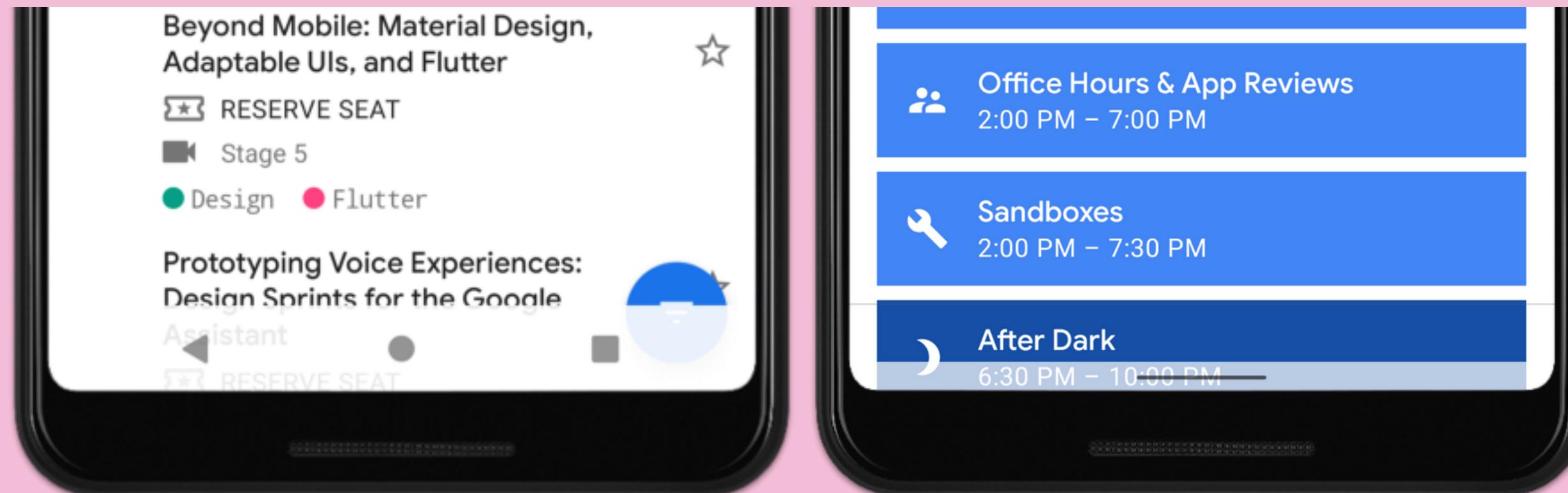


- One of the biggest changes in this decade is the rise of gesture-based controls and navigations.
- Want to comprehend the benefits of these designs' comfort and ergonomics.
- Our objective is to analyze the evolution in this industry and to determine how HCI played a factor.

Three-button setup vs Navigation gestures

Android Q - Google's attempt to standardise gestures on Android phones. According to Product Managers on the Android UI, gestures are a “faster, more natural and ergonomic way to navigate your phone.”

But gestures are harder to learn and can take some adjustment. **Gestures are great for one-handed navigation** because, in theory, you don't have to move your hands from the resting position. Edge-to-edge display but loses simplicity of use.



● Keynote

12:45 Developer Keynote

PM Amphitheatre

● Keynote

2:00 What's New in Gaming at Google

PM RESERVE SEAT

Stage 2

● Gaming

Beyond Mobile: Material Design,
Adaptable UIs, and Flutter

RESERVE SEAT

Stage 5

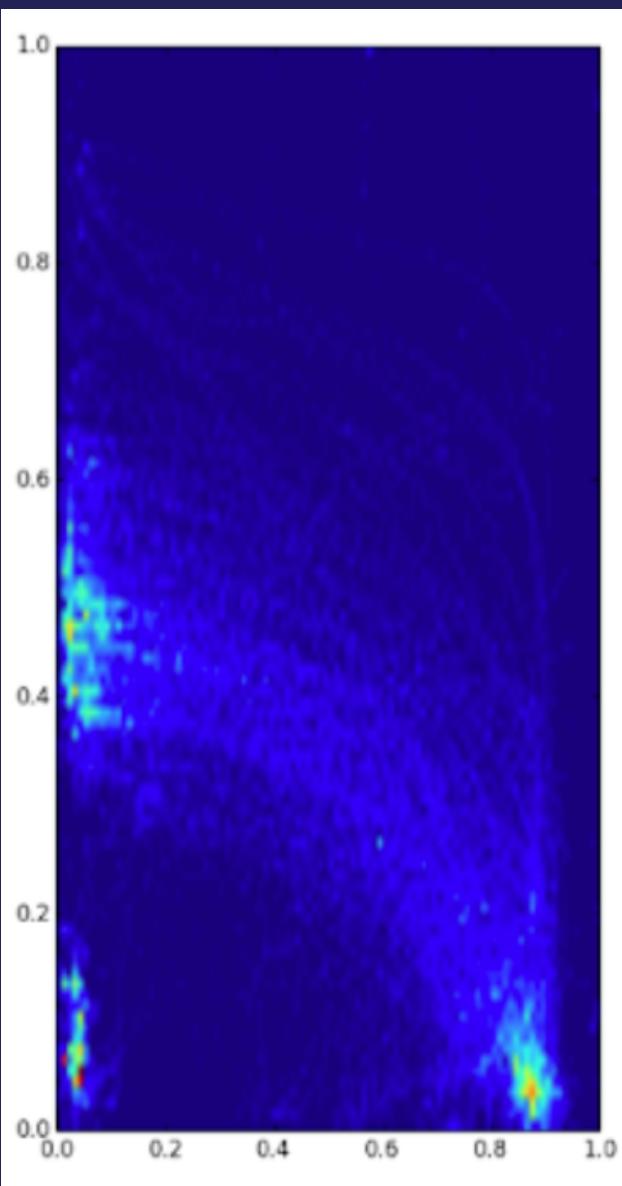
● Design ● Flutter

Prototyping Voice Experiences: Design
Sprints for the Google Assistant

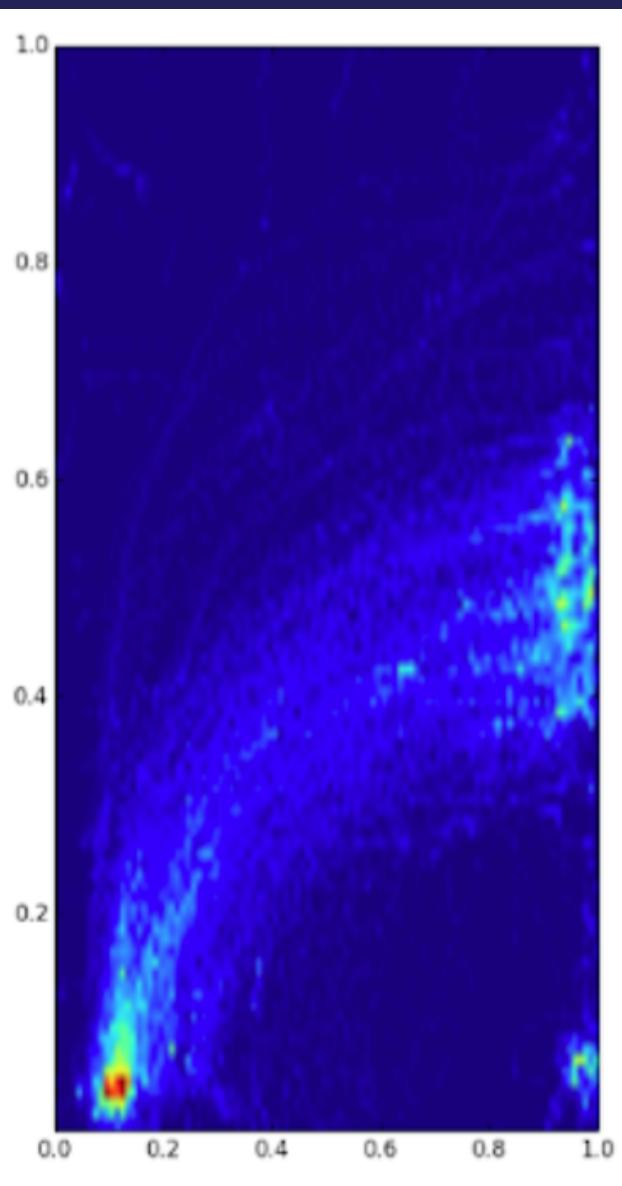
RESERVE SEAT

Stage 7



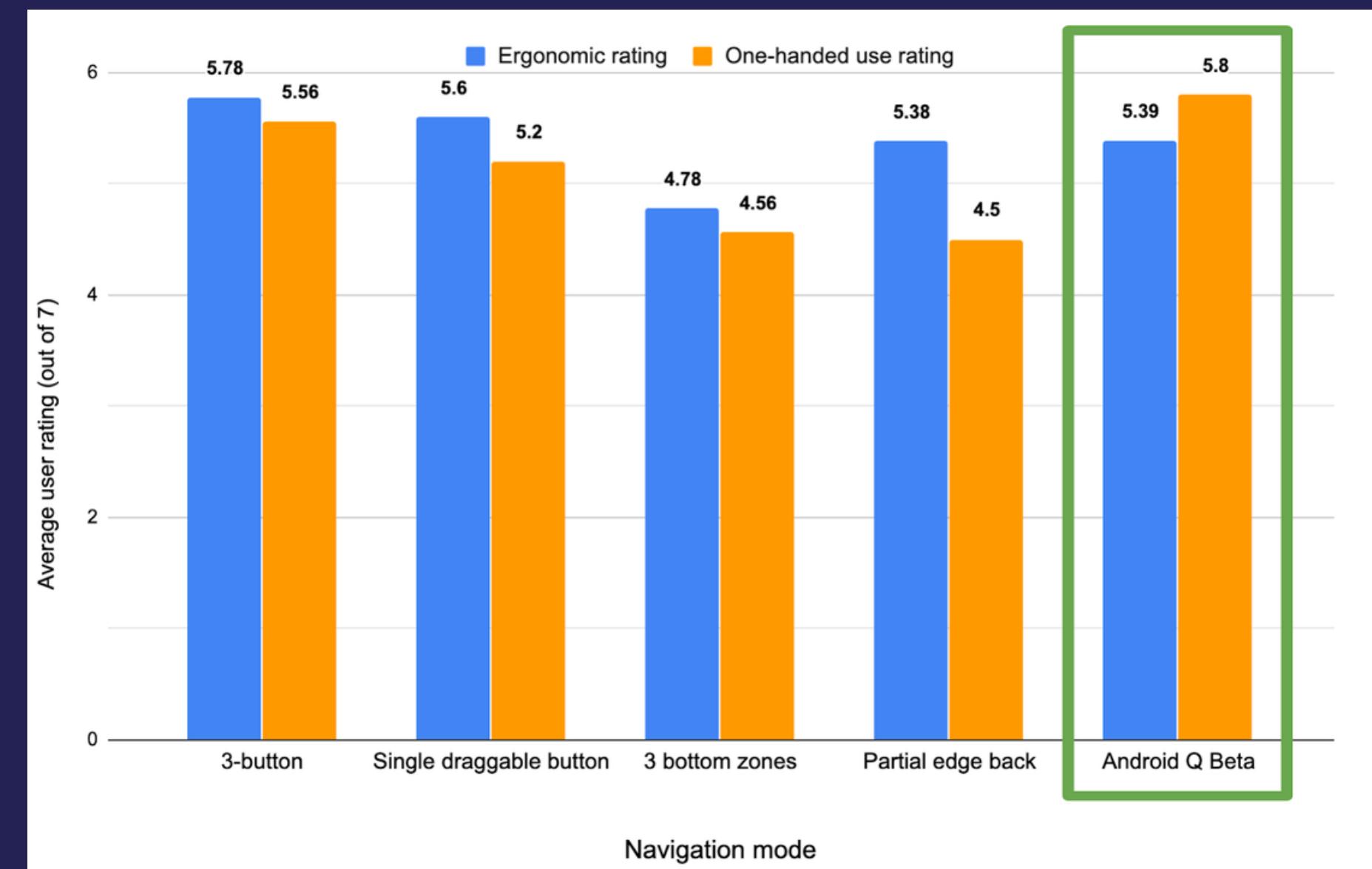


Left thumb
reach



Right thumb
reach

Reachability charts
Two core gestures (Back and Home) were designed to coincide with the most reachable areas and comfortable movement for thumbs

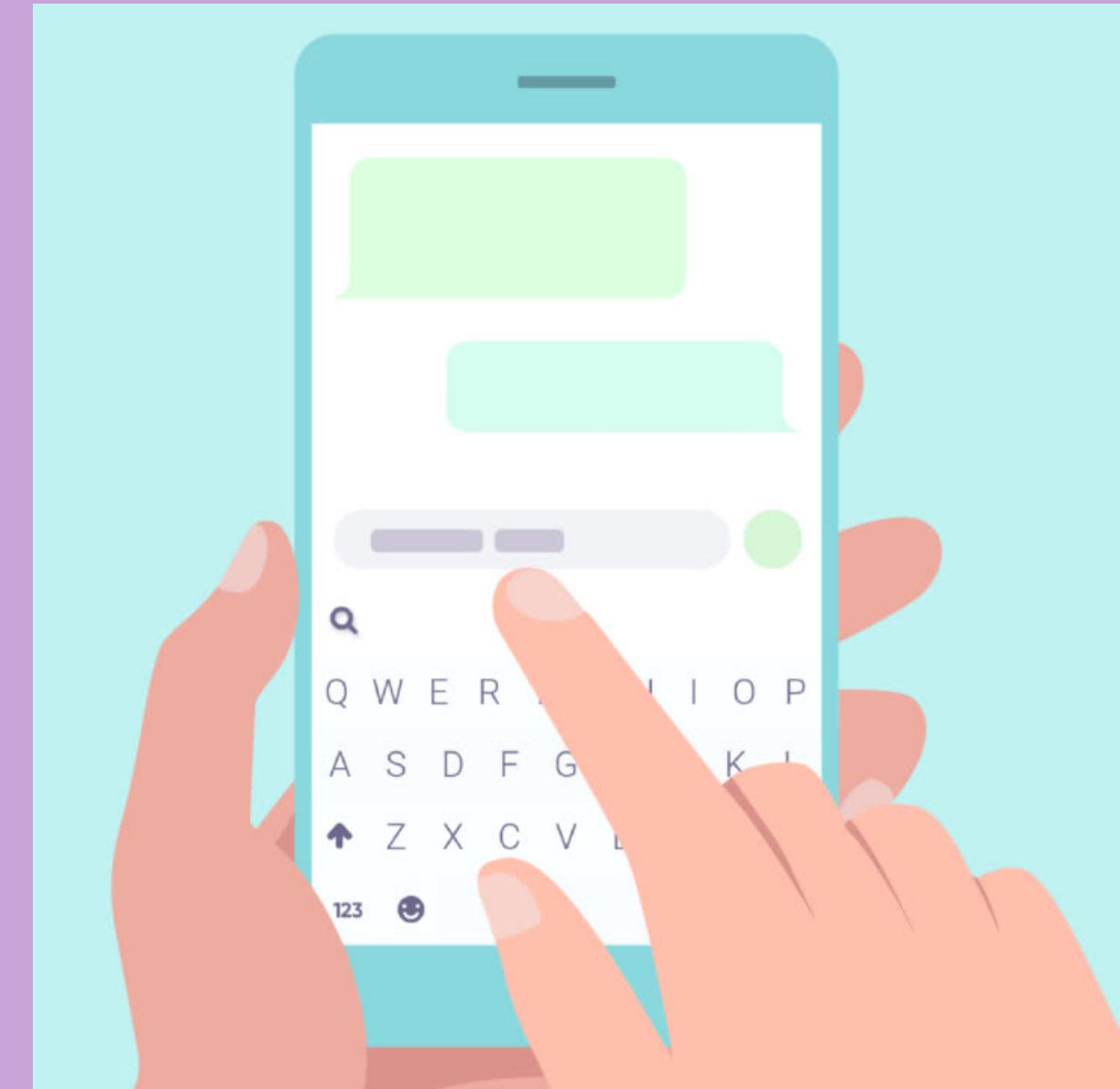


Average users performed Home and Back gestures more quickly with navigation gestures than most other models.

Gesture-based typing

Slide your finger across the letters to spell the word you want. This feature saves time.

Humans are incredibly predictable when it comes to typing, and AI uses just that. Autocompletion + Suggestions + Gestures make typing a seamless intelligent experience for the user.



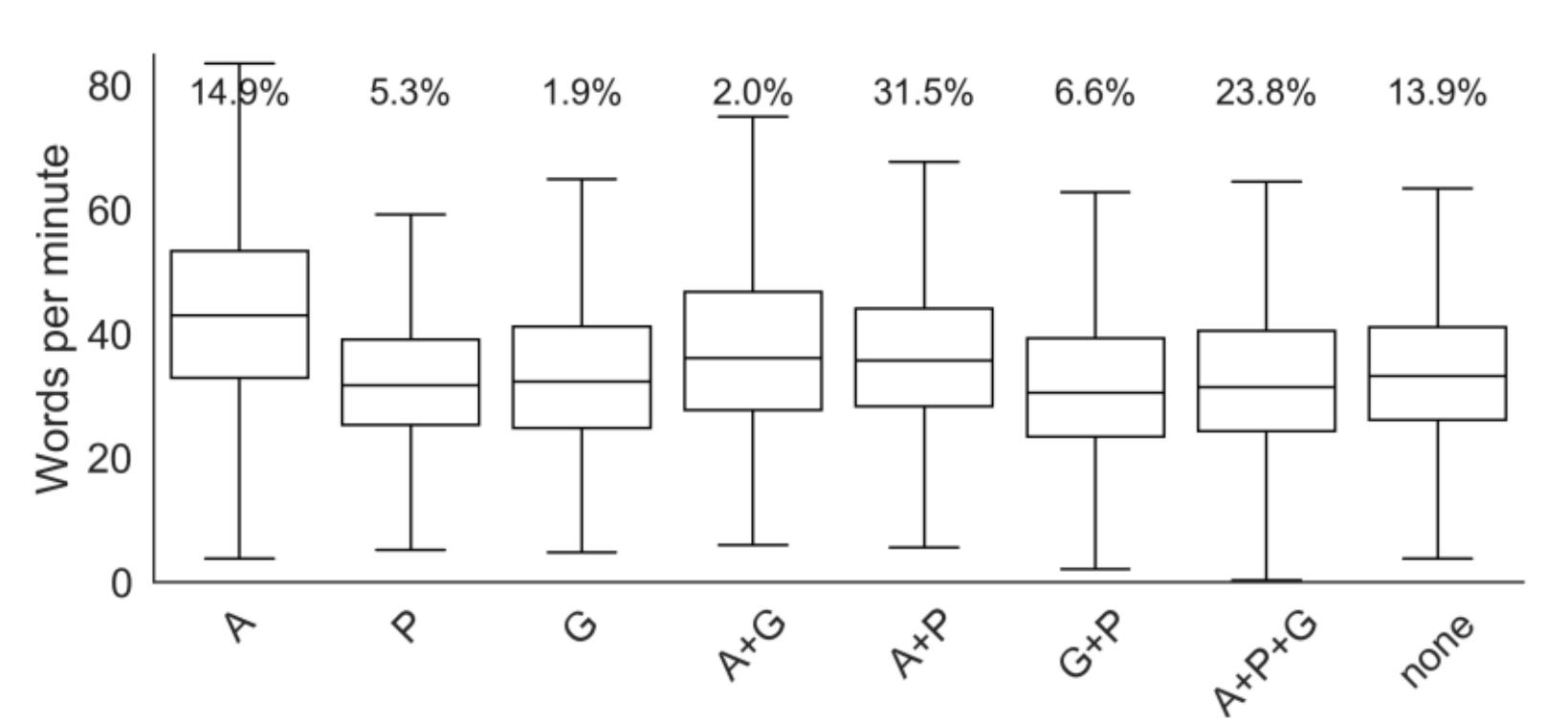
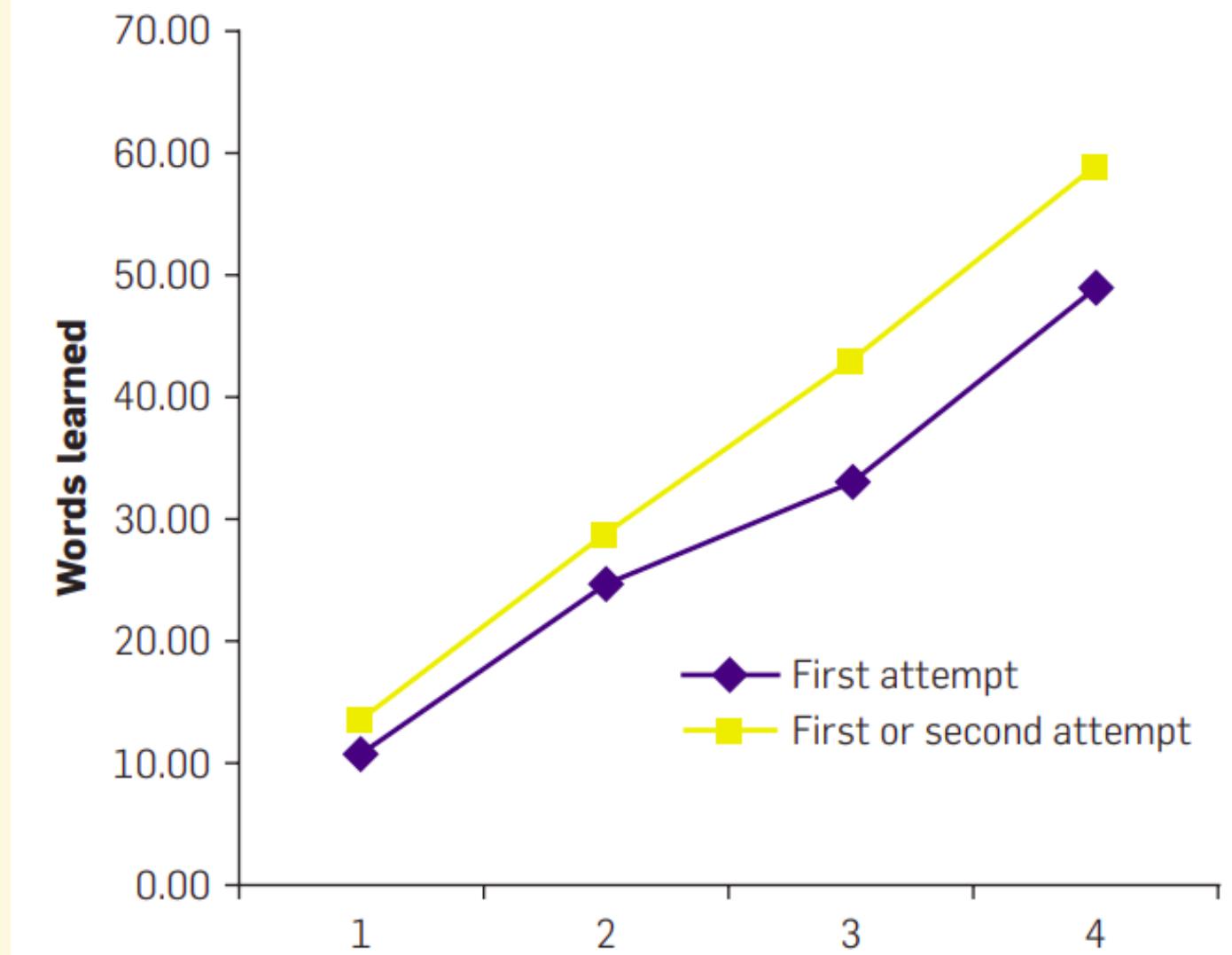


Figure 5: ITE method versus typing speed with 95% confidence intervals and percentage of participants in each group.
P = Prediction; A = Autocorrection; G = Gesture.

Figure 7. The number of word gestures successfully reproduced without looking at a keyboard after each session of practice.



Gesture memory and learning

Where is HCI?

- Designing for Complexity
- Interface Design and Usability
- AI and data HCI: Gesture memory and learning
- Personalization: Gesture shortcuts
- HCI design for age groups



Literature Review

- Tapping and swiping gestures (esafety.gov.au)
- How Do Users Interact With Mobile Devices? An Analysis of Handheld Positions for Different Technology Generations (researchgate.net)
- Android Developers Blog: Gesture Navigation: A Backstory (googleblog.com)
- The word-gesture keyboard: reimagining keyboard interaction (googleusercontent.com)
- (PDF) Understanding Shortcut Gestures on Mobile Touch Devices (researchgate.net)
- Sensors | Free Full-Text | Analysing Touchscreen Gestures: A Study Based on Individuals with Down Syndrome Centred on Design for All | HTML (mdpi.com)



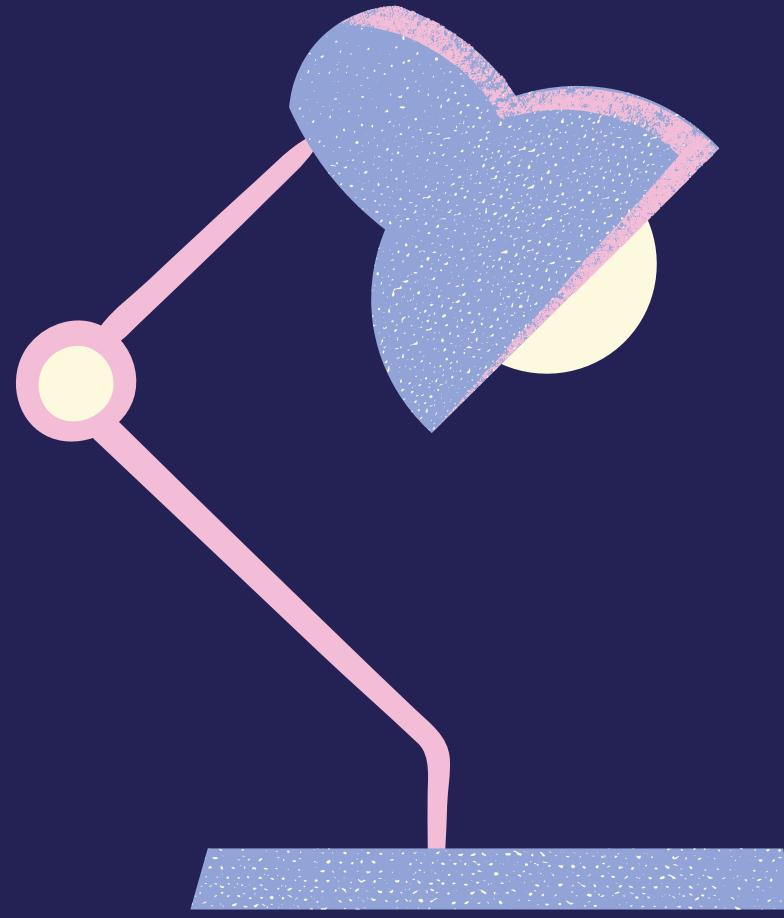
Future work

- Research on different age groups' adaption to the new gesture-based systems.
- Compare different navigation systems from different periods in time and from different designers/companies.
- Understanding the learning process of gesture-based keyboards.





- More gesture shortcuts
 - Double tap to sleep or wake up the screen
 - Shift from button combinations to gestures to take screenshots etc.
- Trackpad finger combinations to replace mouse and keyboard-based navigation



**Thank you for your
time.**

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