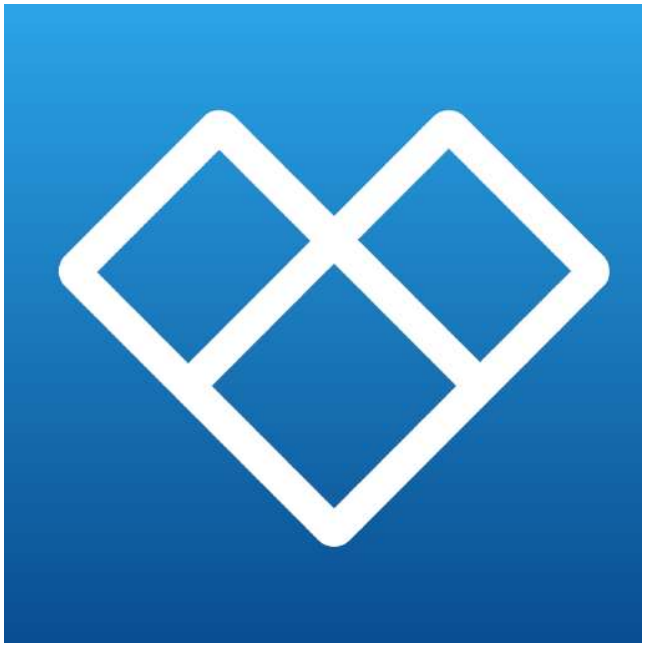

HeartSteps: A JITAI for Supporting Physical Activity in Daily Life

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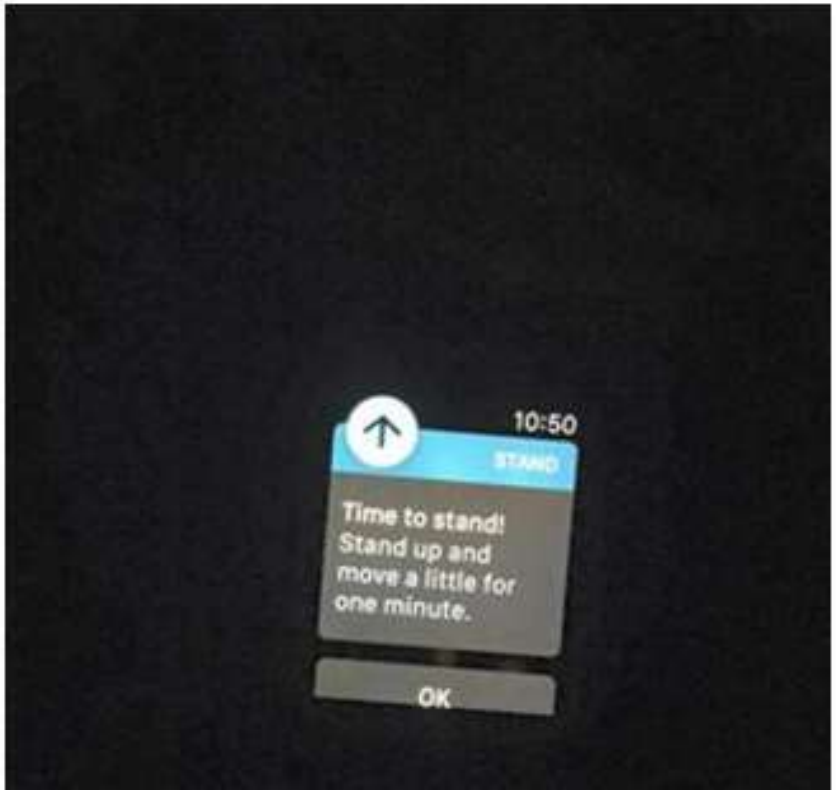
Susan Murphy

[redacted]

6 hrs · [redacted] ·

When I was tucking myself to sleep, my new apple watch suddenly shook itself and told me this. #applewatchnoslackphysicalactivity



JITAI Design Goals

We should aim to develop JITAIs that…

- Contain effective intervention components
- For each person, deliver right components at the right times and in the right context
  - Deliver components when they are likely to be effective
  - Deliver components when the user is receptive
- Adapt to an individual's changing goals, capabilities, and circumstances

JITAI Design Heuristics

- If a feature can be used any time—and it could be useful whenever it's accessed—make it into a pull component. Examples:
  - Self-monitoring graphs
  - Educational materials, etc.
- If there are questions about usefulness of potential push components, optimize package via a baseline factorial experiment
- If you know exactly when a push component should be delivered *and* how it should work, just specify its decision rules
- If usefulness of a push component is unknown, or if effectiveness may vary by context or based on component design (e.g., message framing), specify…
  - (1) provisional decision rules and/or
  - (2) interesting design options

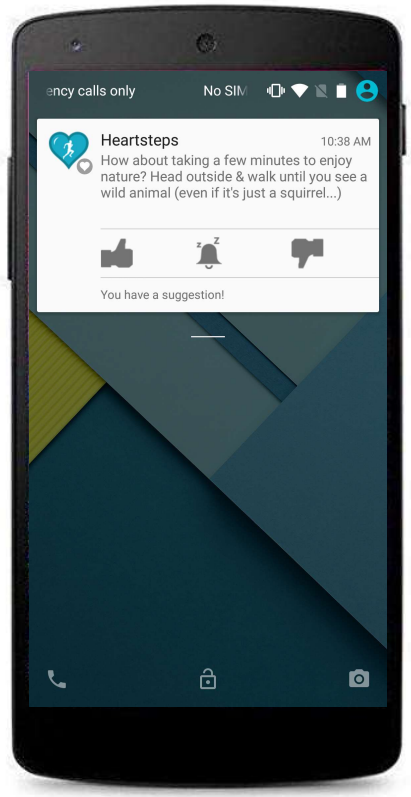
  and test the component and optimize it via an MRT

Heartsteps

V.1

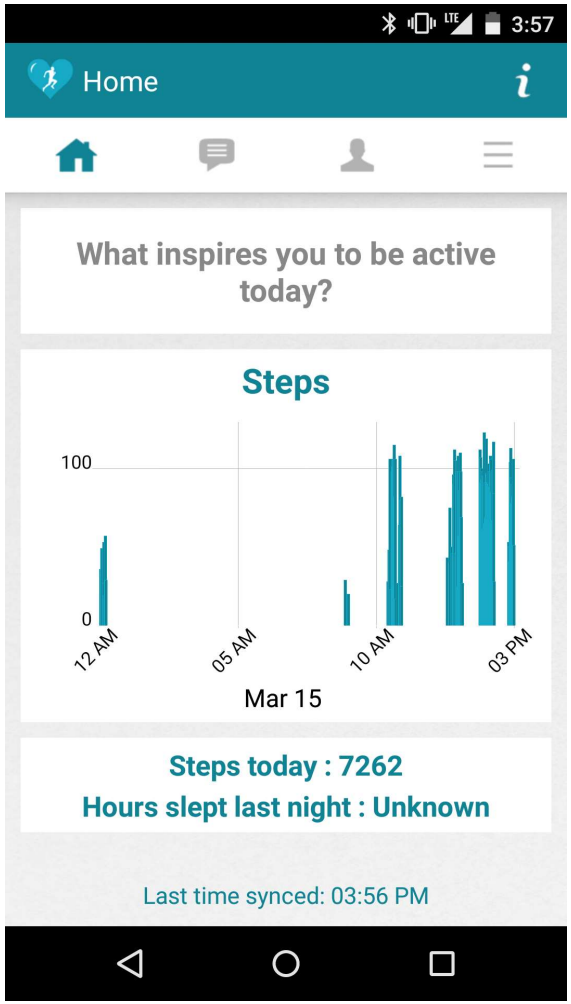
HeartSteps v1 Goals

- Develop a JITAI to help sedentary adults increase physical activity through walking
- Support getting activity throughout the day
- Pilot MRT methods



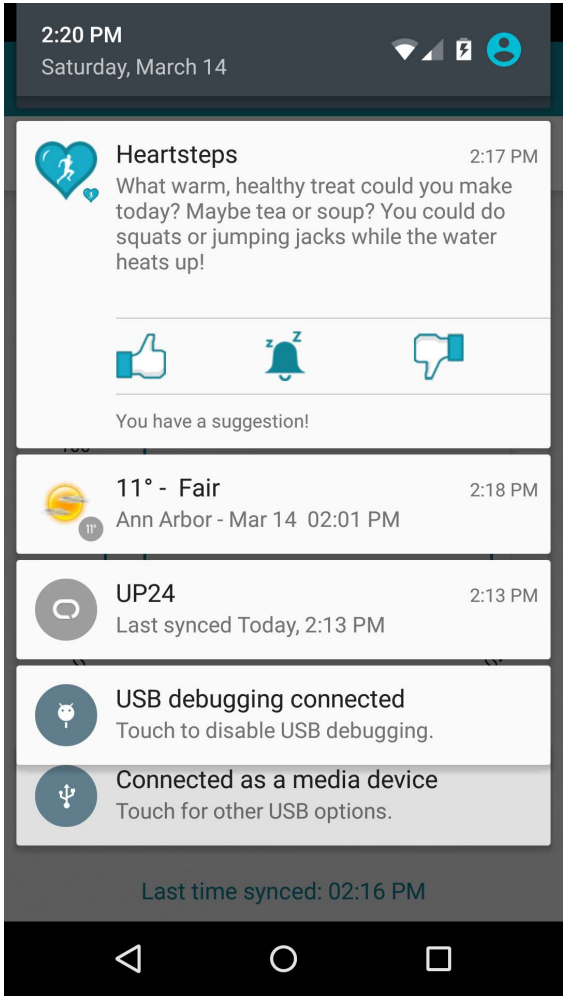
Pull Intervention Components

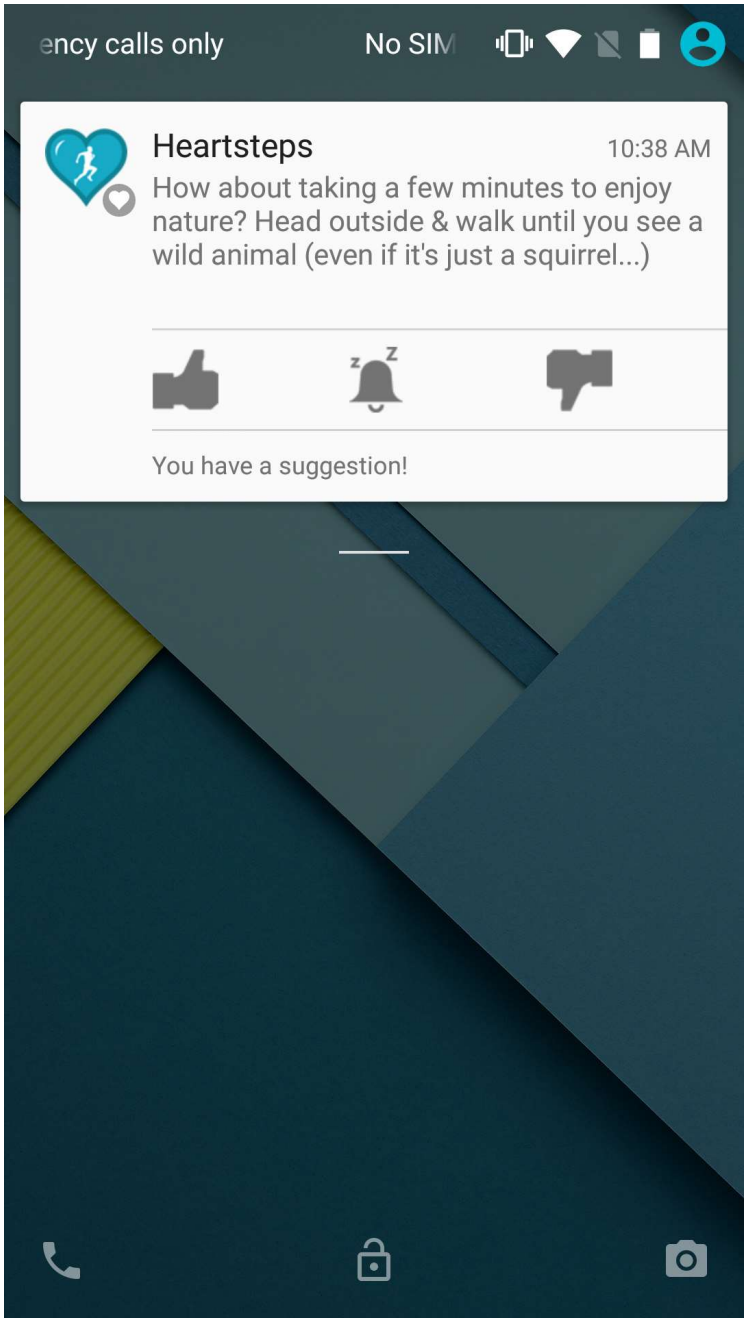
- Feedback on daily steps for self-monitoring
- A library of previously received activity suggestions



Push Intervention Components

- Actionable, context-aware activity suggestions
- Planning of when, how, and where one will be active the next day





Activity suggestions

Goal: Encourage bouts of activity throughout the day.

Suggestions tailored on:

- time of day
- weekday vs. weekend
- location
- weather

Provisional Decision Points for Activity Suggestions

- Plausible times to intervene during the day:
  - Morning commute
  - Lunch time
  - Mid-afternoon
  - Afternoon commute
  - After dinner
- Decision times based on Jawbone data showing high intra-person variability in activity
  - Are all these times opportunities to walk?
  - Does it matter where the person is?

Suggestion Types

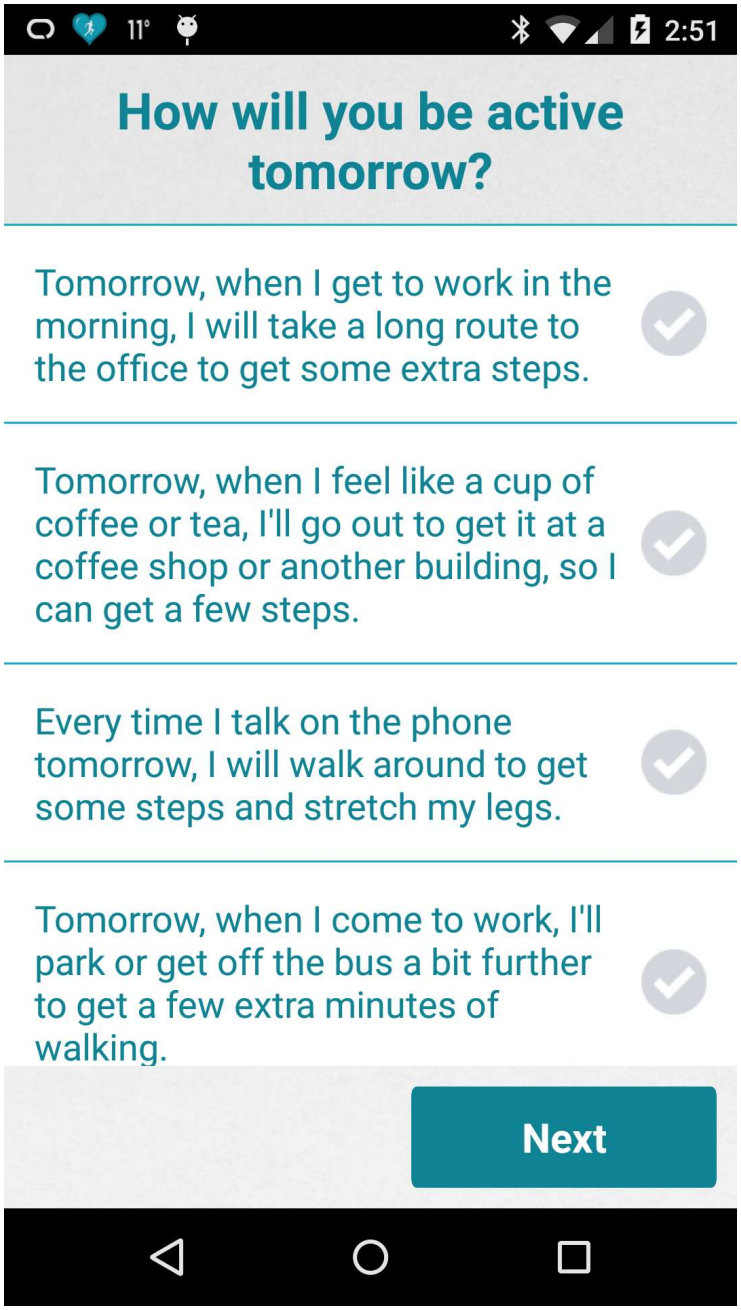
Potential forms of suggestion content:

- Explicit suggestions to walk
  - Pro: Encourage clinically-meaningful bouts of activity
  - Pro: Can be easily tailored to the decision points
  - Cons: Boring
- Suggestions to move around/disrupt sitting
  - Pro: Can be made much more interesting (engagement!)
  - Pro: Lower perceived difficulty
  - Con: May not add meaningful number of steps

Availability

Suggestions only delivered when the user is available to receive treatment:

- Not driving (safety)
- Not currently walking or running (annoyance)



Planning

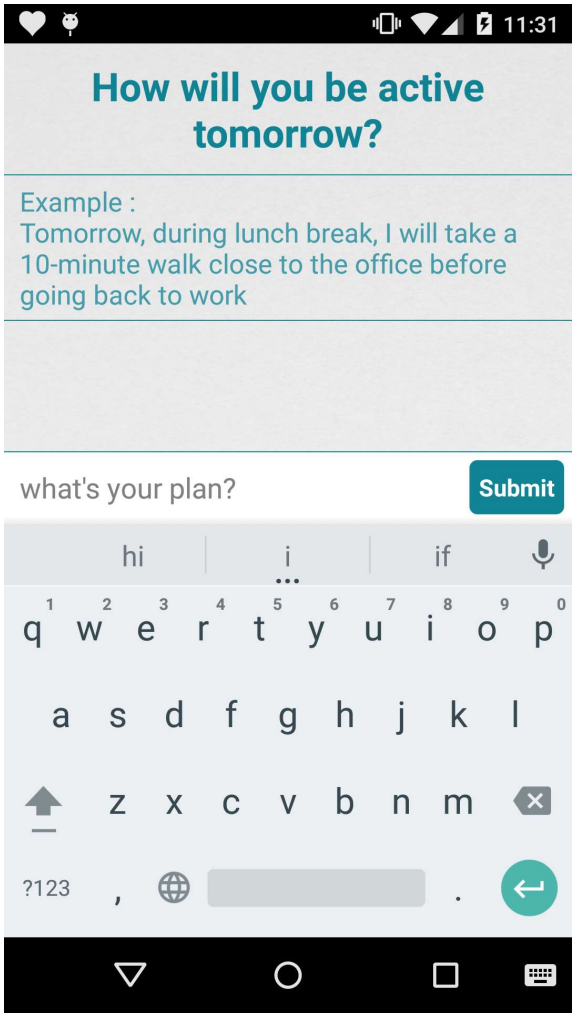
Goal: Increase likelihood of longer activity bouts by creating concrete plans for their execution.

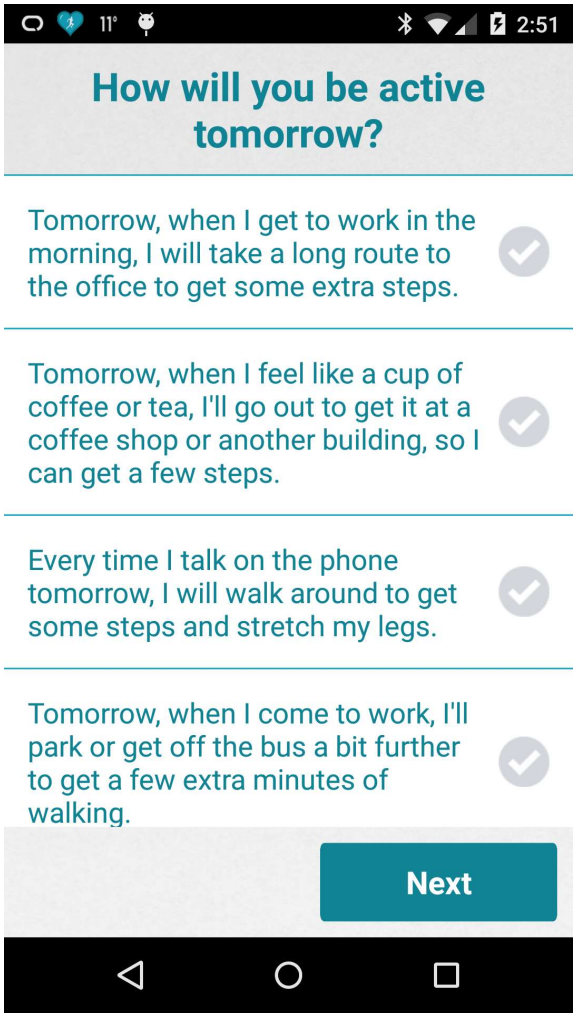
Based on implementation intentions.

Planning Decision Points

- Planning is done in the evening for the following day
- Since planning is not extremely time-sensitive, no availability considerations for planning

Potential Designs for Planning





Planning Design Trade-Offs

- Open-Ended Planning
  - Pro: High-fidelity instantiation of implementation intentions
  - Con: Laborious
  - Con: Doesn’t take into account daily routines
- Choosing from a list
  - Pro: Much faster and less laborious
  - Pro: Allows people to choose appropriate plans they have already made
  - Cons: Different than how implementation intentions are typically done—unclear if they may be effective

HeartSteps v1 Design Summary

- Even with two push components, there are a number of design decisions that we could not make with high degree of confidence
- Open questions related both to timing of intervention delivery and about their design
- The more timely the component is intended to be, the more open questions about timing are likely to come up

Back to Your JITAIs

- Iterate on your plans for the intervention components you want to include
- Focus on:
  - Questions about timing:
    - When should the component be delivered?
    - Is the user's context (e.g., location, weather) likely to matter?
    - Is the user's state (e.g., stress, energy level) likely to matter?
  - Questions about intervention design:
    - Are there interesting questions about user experience?
    - Are there interesting questions about intervention content?