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Irrational Interaction Design

Tobias Stockinger

Supervisor: Prof. Dr. Matthias Kranz

29.07.2014

Doctoral Colloquium, University of Munich
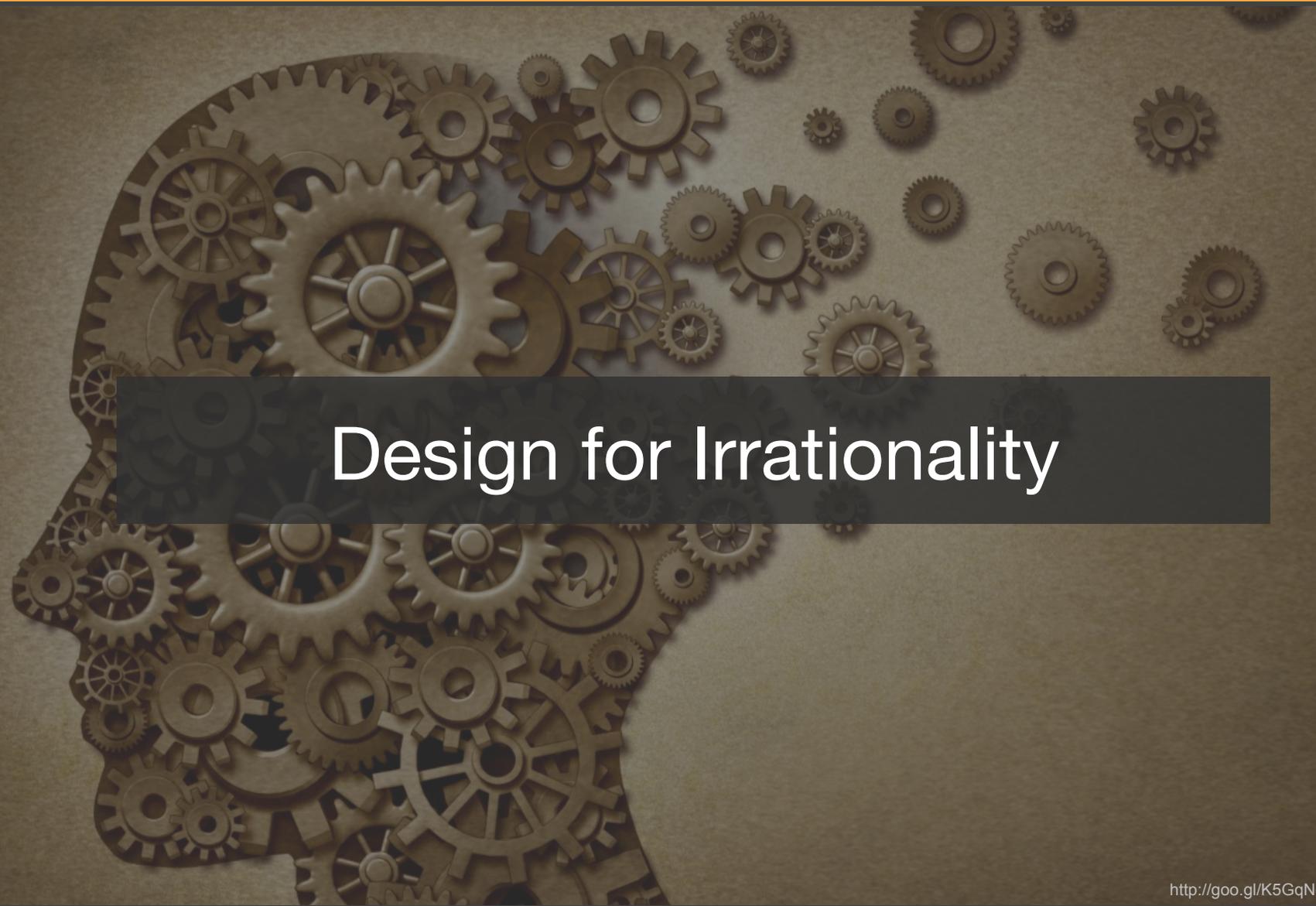
Design for Irrationality

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http://goo.gl/K5GqNo

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Agenda

- Background

- Prior Work
    - SmartPiggy
    - SocialRide

- Research Ideas
    - Irrationality: Gamification of SSL Usage
    - Persuasion & Sustainability: Recycling
    - Persuasion & Finances: Smart Credit Card
    - Misc:
   - Meta Studies
        - "Old Monitor Study"

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per·sua·sion

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Classical Definition

"I define persuasive technology as any interactive computing system designed to change people's attitudes or behaviors."

B.J. Fogg

Persuasive Technology: Using Computers to Change What We Think and Do (2003)

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Massive body of (recent) literature!

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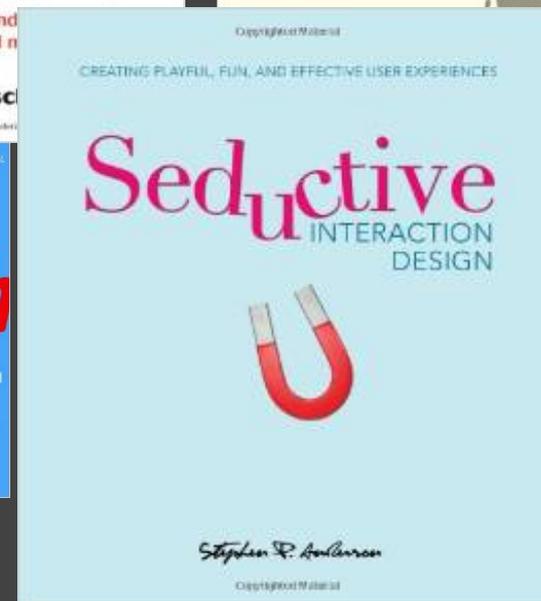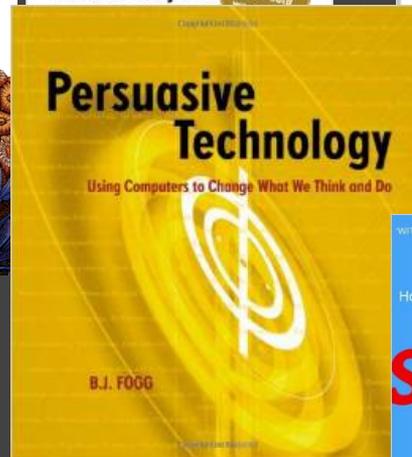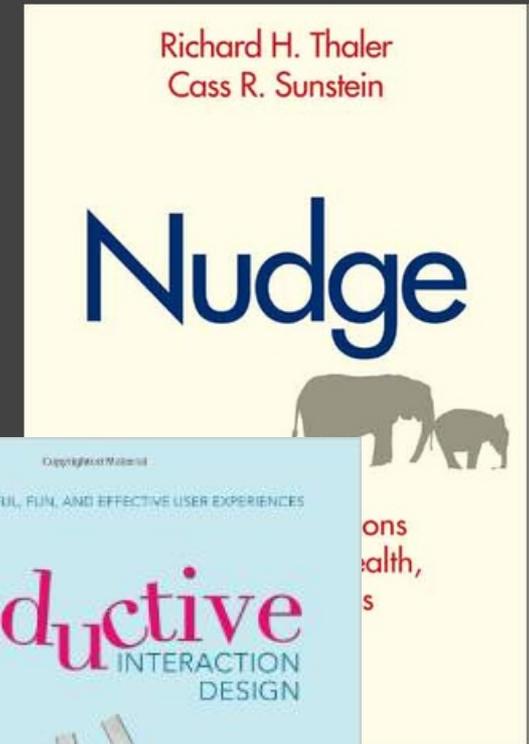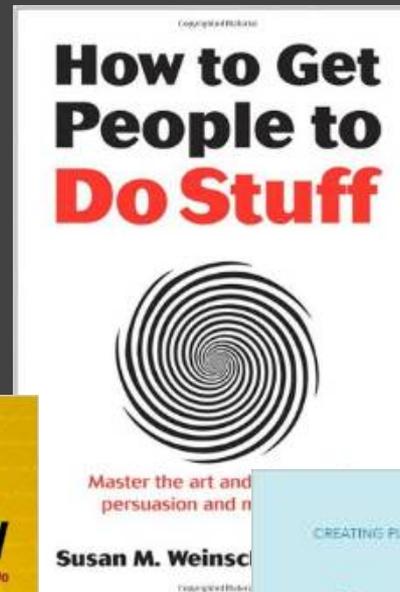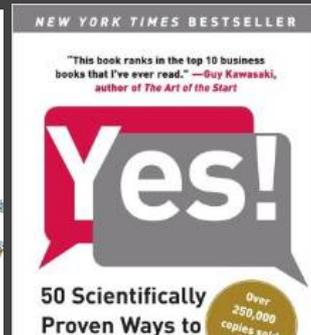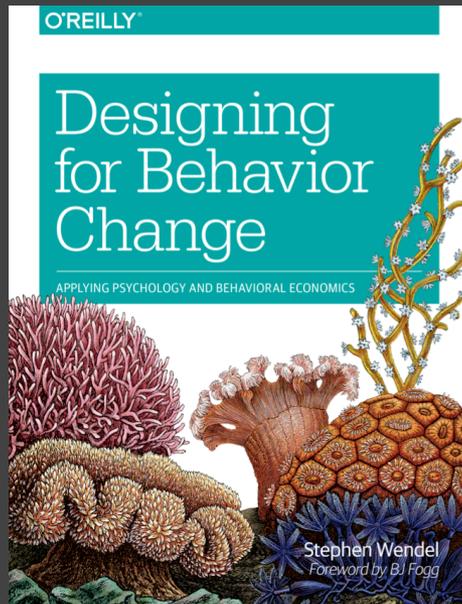
Irrationality

Irrational:
Non-optimal, voluntary, intentional decisions,
that are made despite knowing better.

Nach S. Sutherland. "Irrationality", Pinter and Martin (2013)
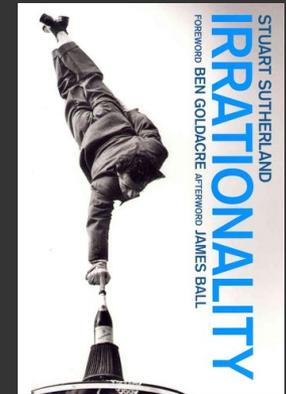
- Not often addressed in interaction design
- "Emotional Design" encompasses parts of it (D. Norman)
- Behavioral Economics produced many theories towards irrationality

- How can interaction design profit from irrationality?

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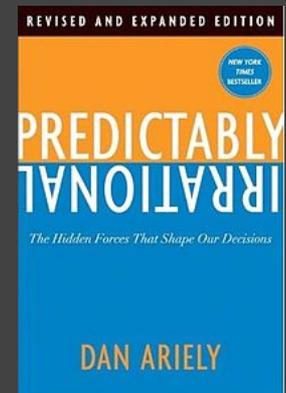
List of cognitive biases

From Wikipedia, the free encyclopedia

Cognitive biases are tendencies to think in certain ways. Cognitive biases can lead to systematic deviations from a standard of rationality or good judgment, and are often studied in psychology and behavioral economics.

Although the reality of these biases is confirmed by replicable research, there are often controversies about how to classify these biases or how to explain them.[1] Some are effects of information-processing rules (i.e. mental s produce decisions or judgments. Such effects are called *cognitive biases*.[2][3] Biases in judgment or decision-making can also result from motivation, such as when beliefs are distorted by wishful thinking. Some biases have a explanations. Both effects can be present at the same time.[4][5]

There are also controversies as to whether some of these biases count as truly irrational or whether they result in useful attitudes or behavior. For example, when getting to know others, people tend to ask leading questions whi assumptions about the person. This kind of confirmation bias has been argued to be an example of social skill: a way to establish a connection with the other person.[6]

The research on these biases overwhelmingly involves human subjects. However, some of the findings have appeared in non-human animals as well. For example, hyperbolic discounting has also been observed in rats, pigeons,

Decision-making, belief, and behavioral biases   [edit]

Many of these biases affect belief formation, business and economic decisions, and human behavior in general. They arise as a replicable result to a specific condition: when confronted with a specific situation, the deviation fro by:

Name	Description
Ambiguity effect	The tendency to avoid options for which missing information makes the probability seem "unknown."[8]
Anchoring or focalism	The tendency to rely too heavily, or "anchor," on one trait or piece of information when making decisions (usually the first piece of information that we acquire on that subject)[9][10]
Attentional bias	The tendency of our perception to be affected by our recurring thoughts.[11]
Availability heuristic	The tendency to overestimate the likelihood of events with greater "availability" in memory, which can be influenced by how recent the memories are or how unusual or emotionally charged they may be.[12
Availability cascade	A self-reinforcing process in which a collective belief gains more and more plausibility through its increasing repetition in public discourse (or "repeat something long enough and it will become true").[13]
Backfire effect	When people react to disconfirming evidence by strengthening their beliefs.[14]
Bandwagon effect	The tendency to do (or believe) things because many other people do (or believe) the same. Related to groupthink and herd behavior.[15]
Base rate fallacy or base rate neglect	The tendency to ignore base rate information (generic, general information) and focus on specific information (information only pertaining to a certain case).[16]
Belief bias	An effect where someone's evaluation of the logical strength of an argument is biased by the believability of the conclusion.[17]
Bias blind spot	The tendency to see oneself as less biased than other people, or to be able to identify more cognitive biases in others than in oneself.[18]

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The Decoy Effect

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The Decoy Effect

A

A-

B

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Is George W. Bush's IQ higher or lower than **91**?

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Anchoring

Is George W. Bush's IQ higher or lower than **159**?

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So far…

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SmartPiggy

- The piggy bank that talks to your smartphone

- Counts the money and encourages you to save

- Design inspired and informed by theories from behavioral economics
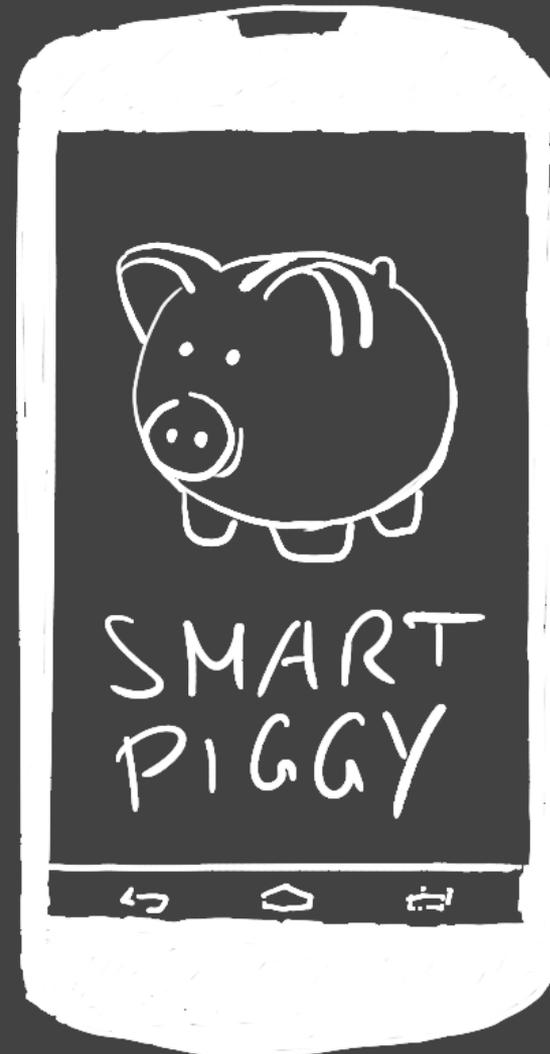
Stockinger, T., Koelle, M., Lindemann, P., Witzani, L., & Kranz, M. (2013, December). SmartPiggy: A Piggy Bank that talks to your Smartphone. In Proceedings of the 12th International Conference on Mobile and Ubiquitous Multimedia (p. 42). ACM.

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Anchoring

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http://mashable.com/2013/11/21/public-transportation-gif/

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Ride Sharing – Case Study

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Why do you share rides (with strangers)?

- Financial Reasons
- Social Reasons
- Environmental Protection
- Alternative to Trains
- Alternative to Busses

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Why do you share rides (with strangers)?

- ■ Financial Reasons
- ■ Social Reasons
- ■ Environmental Protection
- ■ Alternative to Trains
- ■ Alternative to Busses

"It's cheap and I really hate taking the train."

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Ride sharing and social networks

- Rides are more and more offered on Facebook

- Amplify behavior (instead of changing it):
  – Visualize monetary savings and earnings
  – Compare savings to other means of public transport
  – Illustrate CO_2 savings comprehensively

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Ridesharing with "SocialRide"

- Parses offers and requests in Facebook group posts

- Collects and analyzes driving data (start, end, fellow passengers, punctuality)

- Evaluation still running, field study after publication in fall of 2014

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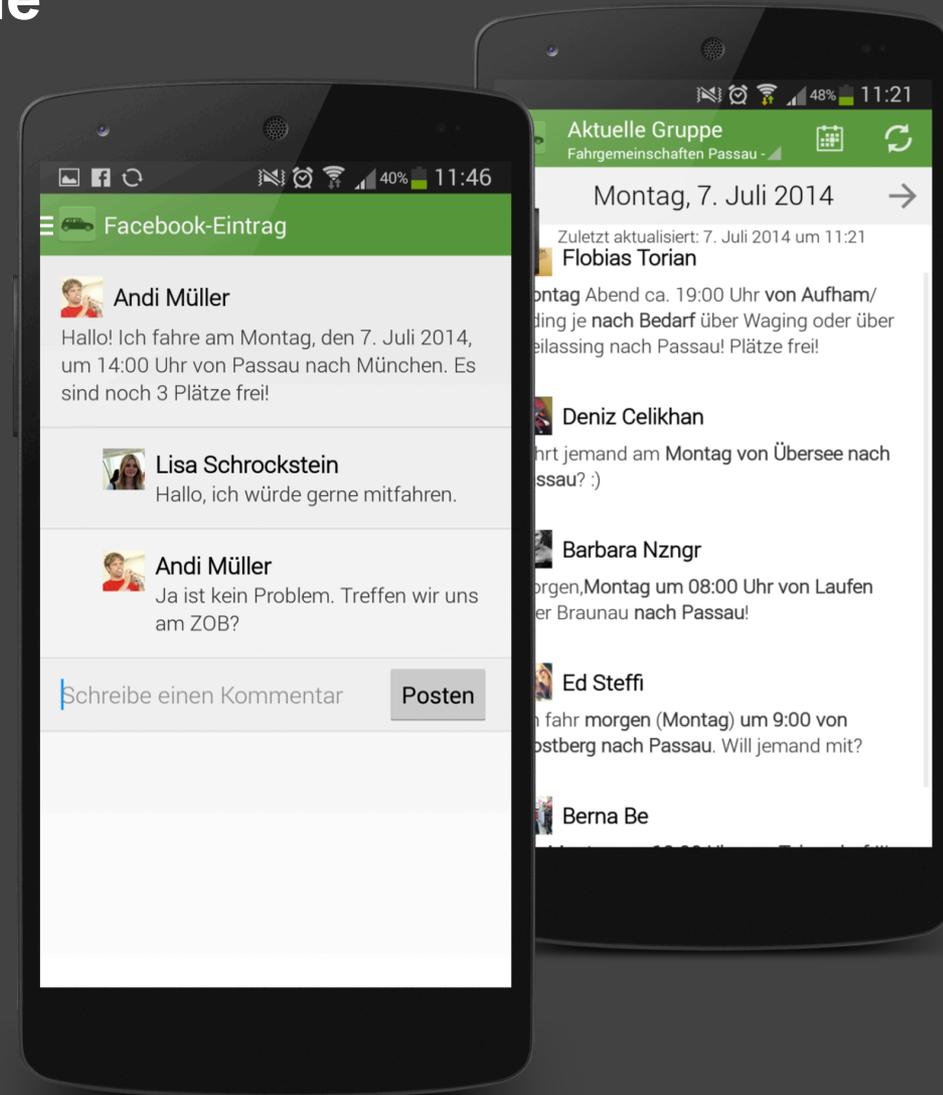
Preliminary results

- Gamification impacts intrinsic motivation (negatively)

- 83% of subjects use Facebook for ride-sharing

- GPS Feature / statistics critical because people showed fear of being tracked

http://goo.gl/fKQmiE

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A propos Tracking…

- Online Survey (June / July 2014) –
  Which WiFi settings do you regularly use?

- I enable WiFi all the time, even if I don't need it
- I always deactivate WiFi
- I regularly turn off WiFi.
- I'm not sure
- Other...

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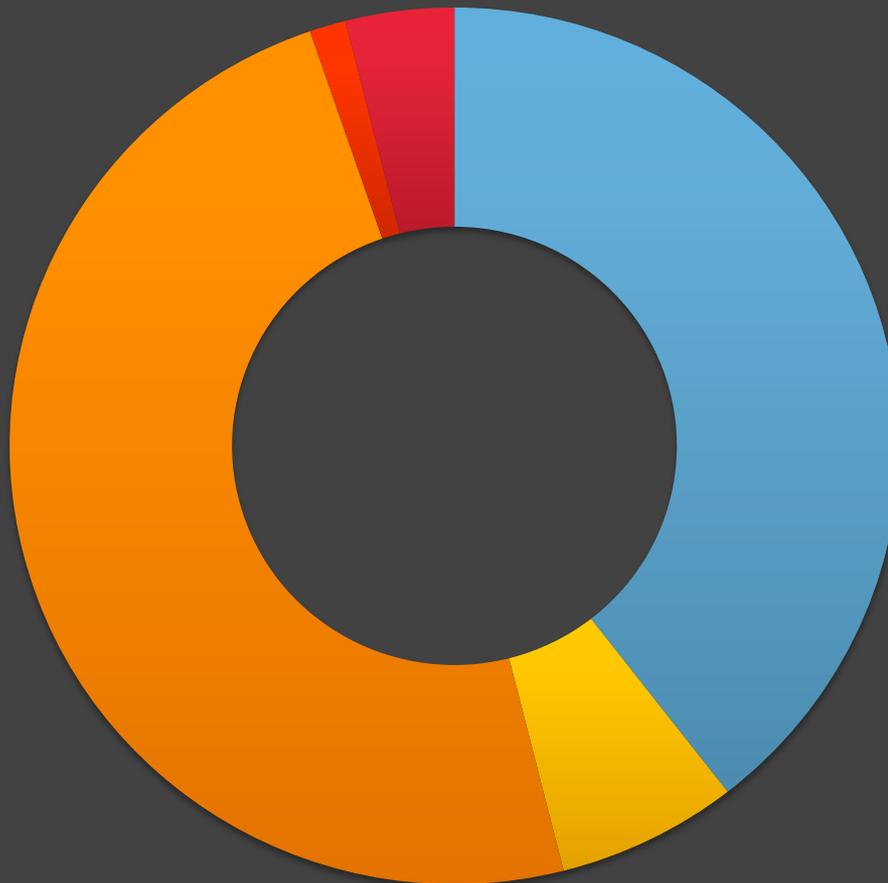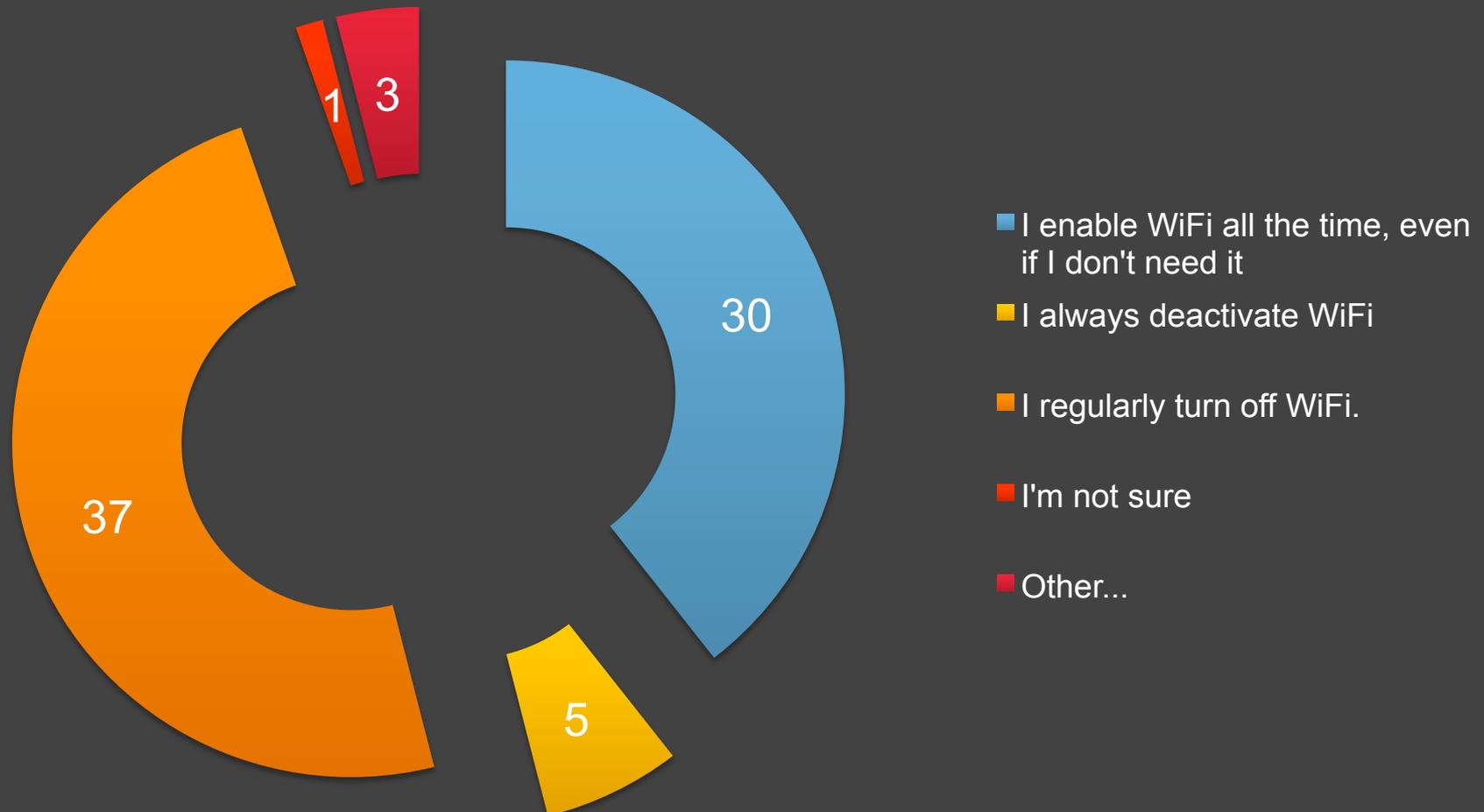
How iOS Communicates Location Services

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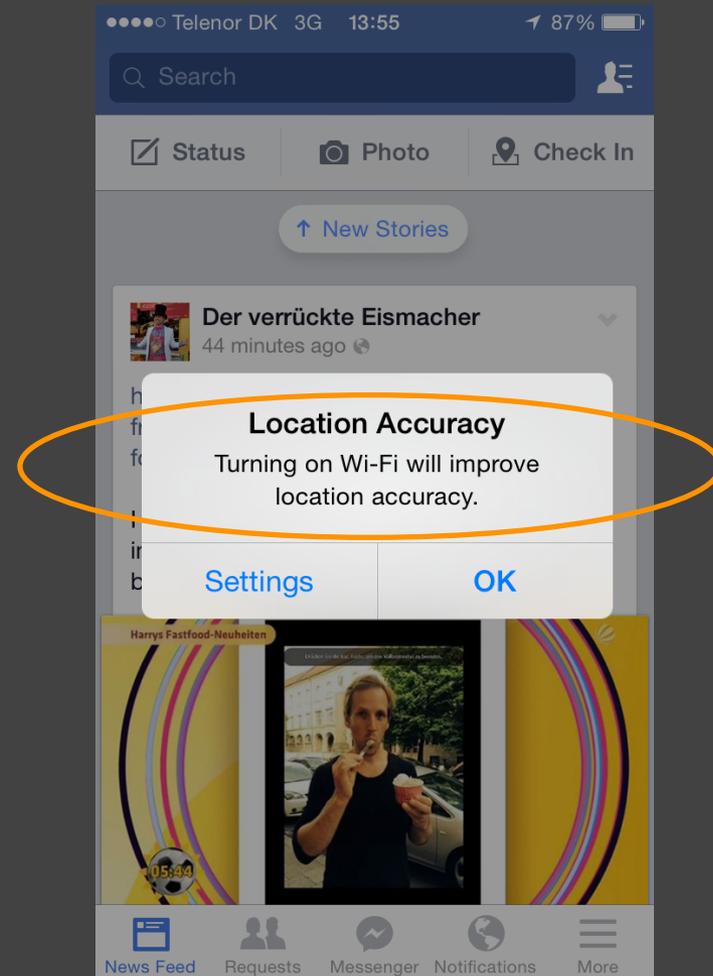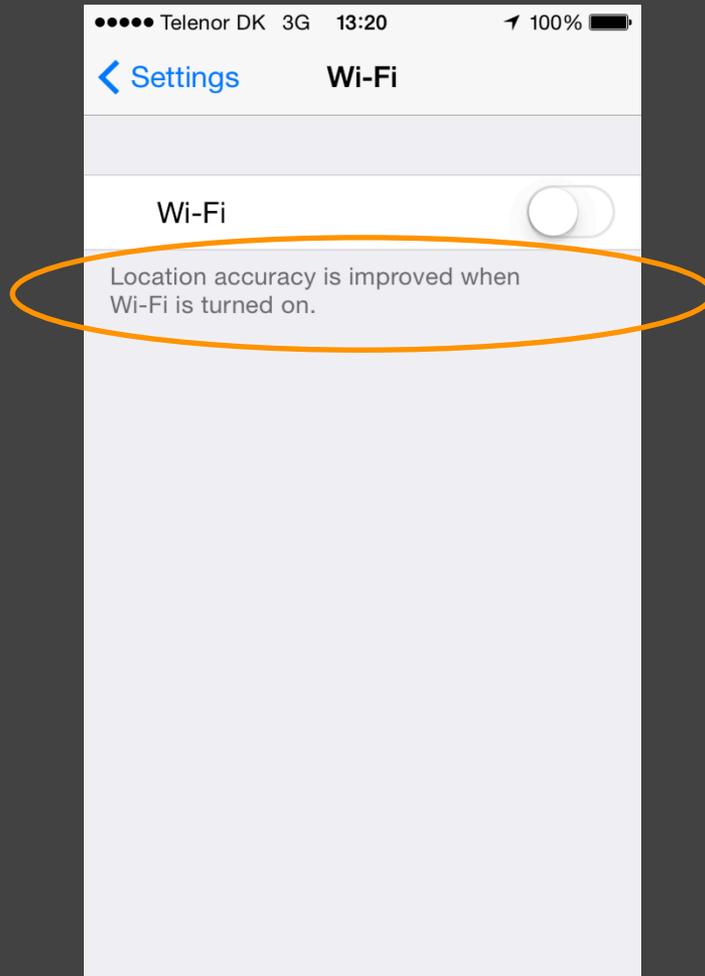
How Android communicates Location Services

- High Accuracy
  = GPS, WLAN, 3G/4G

- Energy Saving Mode
  = WLAN, 3G / 4G

- Device-Only
  = GPS

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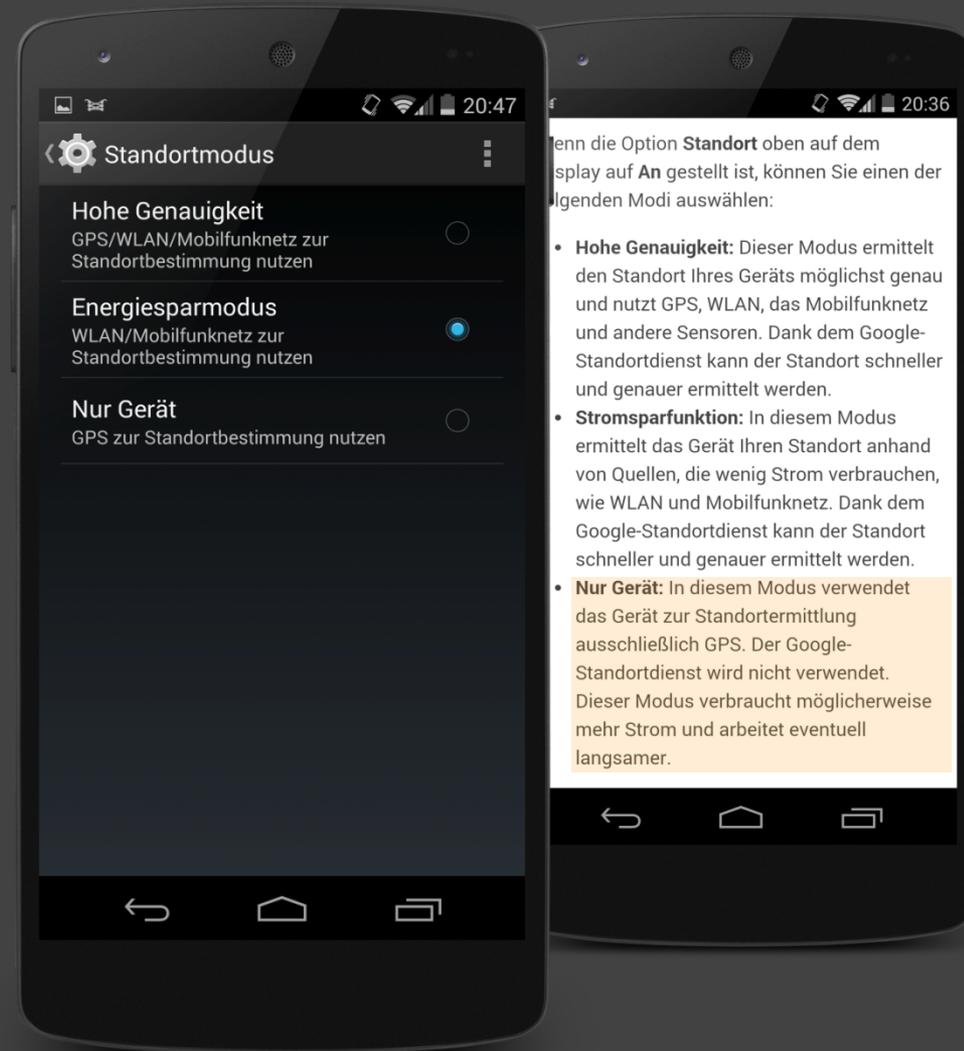
How Android communicates Location Services

- High Accuracy
  = GPS, WLAN, 3G/4G

  A-

- Energy Saving Mode
  = WLAN, 3G / 4G

  A

- Device-Only
  = GPS

  B

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What's next?

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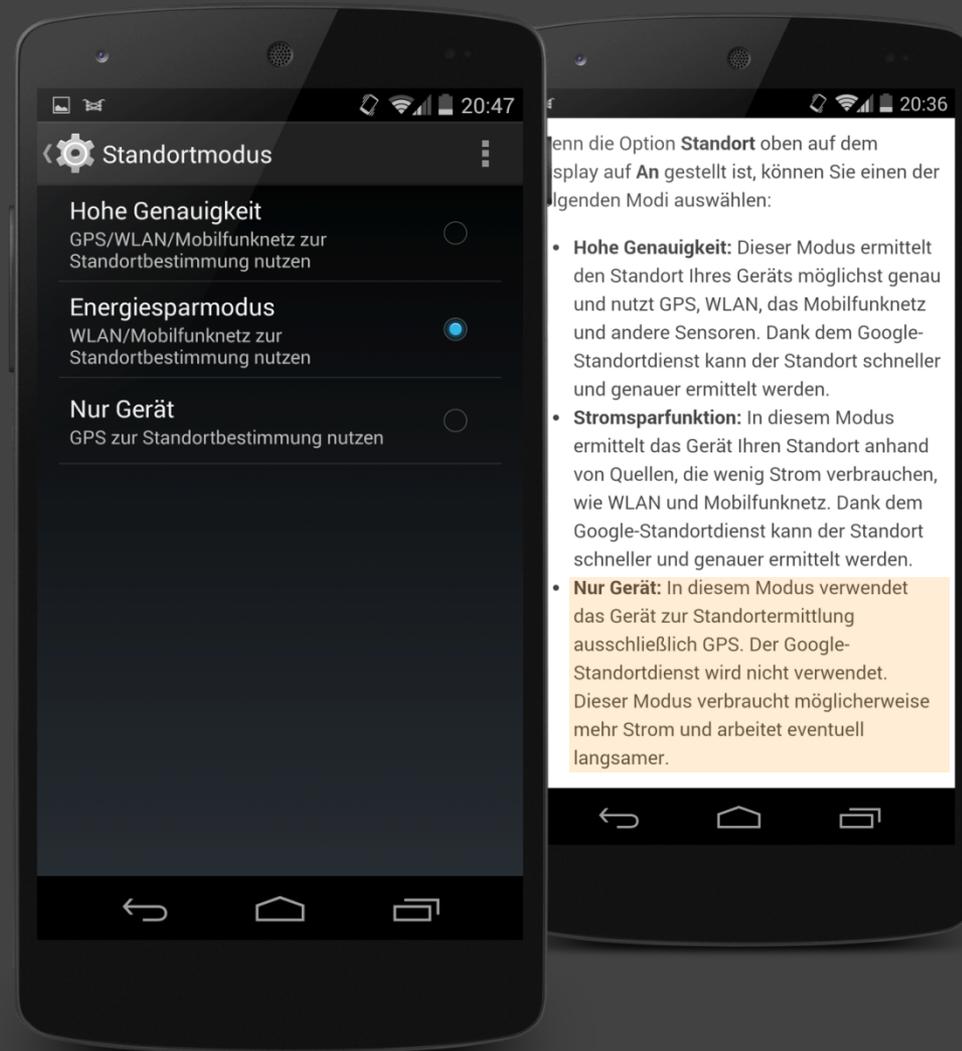
Irrationality: Gamification of SSL Usage

- **Problem**: Encryption status goes unnoticed, phishing
- **Idea**: Reward users for using SSL connections
- **Solution**: Browser-Plugin (Desktop & Mobile)

- **Research Questions & Goals**:
  – What happens if you reward users for something they cannot control?
  → Find evidence for „Illusion of Control" (Cognitive Fallacy) in technical context

  – How does this cater to the user's intrinsic need for security?

  – Do users start caring about SSL?

http://goo.gl/4ygp8r

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Persuasion: Recycling

- **Problem**: Effort in going to recycling yard
- **Idea**: "Ride Sharing" or favors for people
- **Solution**: Platform similar to ride sharing, with a specific purpose

- **Research Questions & Goals**:
  - How can we increase and measure intrinsic motivation to recycle?

  - Track current recycling behavior

  - To what degree is it possible to motivate recycling extrinsically?

http://goo.gl/sMhf1W

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Persuasion: Smart Credit Card

- **Problem**: Saving is difficult for many
- **Idea**: Remind of saving while spending money
- **Solution**: Context-sensite framework + push messages on smartphones (informed by behavioral economics)

- **Research Questions & Goals**:
  - Provide quantitative evidence for behavioral economics theories in a novel context

  - Do people actually save more?

  - Qualitative feedback

http://consciousanima.net/projects/spendtrend/

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Miscellaneous

- „Old Monitor" Study:
  - Hypothesis: Systems start to „feel slow" just because the I/O devices are old or damaged.
  - Evaluation using an A/B study with new and old monitors & keyboards

- Meta studies:
  - Does asking questions in usability tests impact behavior later on?
  - Is it valid and representative to recruit study participants via Facebook?

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Thank you for your attention & suggestions!

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