My goal…

- … is to make your experience better
- … to make you smarter, more capable, wiser

How can we get there?

- Integrate the beauty of analytical data with hardnosed design
I am not the hardcore hammerheaded Harpy of analytics over design.

I am a pragmatist.

I just want to make the experience better.
Intuitions are terrible.

In particular, your intuitions are terrible.

That’s why we do studies.

Fallacy #1: “I do it this way”

Fallacy #2: “My Mom does it that way”

Deep truth: you are statistically insignificant

Deeper truth: you’re a couple sigma away from the norm

… so are your friends
Our intuitions fail us...

- No matter what *Blink* claims, our intuitions about web-app design suck...

Here’s why:
- Confirmation bias
- Sampling bias
- “Natural statistics” errors
- Sample sizes too small
- … many other causes…

- Invisibility of aggregated end-user behaviors
Why do all analysis?

- To understand what our searchers are doing…
  - Trials and tribulations
  - Emotional reactions—both positive and negative
  - Root factors driving behaviors
  - In situ understanding of intent
  - Mental models of what they’re doing…
  - … and whether or not they’re happy with what Google does
Multiple views of data

- **Micro:** lowest level details—milliseconds
- **Meso:** mid-level observations—minutes to days
- **Macro:** millions of observations—days to months
How we approach the problem

1. Eyetracking studies
   Studies in the microscopic

2. Field studies
   Getting out to see what meso-reality is

3. Sessions analysis
   What are people doing macro in logs, bring outside behavior back to where we can see the signals
Eyetracking & usability studies at Google

~10-20 / week – typically 3 – 5 observers

- Testing new, specific features of UI

**Typical studies:**
- How users perceive a UI change
- Eyetracking to get at deeper understanding
2 Lies, Truth & Videotape — Field studies

- Interviews held *in situ*…
  - Workplace, home, coffee shop ….any place… must be search-place
  - Place + context cueing effects
  - Interested in natural use phenomena (ads, distractions, multiple tasks…)

*How does a search engine work?*
So this is celebrity with most Oscars...
Actor... ah... most...
I’m just going to try that...most Oscars... don’t know...

(reading) “News results for ‘actors most Oscars’...”

Oh, then that would be currently “Brokeback”... “prior voices”... “truth in Oscar’s relevance”...

...now I know...
...you get a lot of weird things...hold on...
“Are Filipinos ready for gay flicks?”
How does that have to do with what I just...did...?
Ummm...
So that’s where you can get surprised... you’re like, where is this... how does this relate...umm...
Bond...I would think...
So I don’t know, it’s interesting...

Dan: Did you realize you were in the News section?
Oh, no I didn’t. How did I get that?...

Oooh... no I didn’t.
Understanding the behavior of the many

- We have a lot of data: many TB weekly in logs

- How to analyze it?

- How does this drive design?
  - When we run experiments, what’s the effect?
What is the world thinking today?

A regular Sunday:

A special Sunday: Football World Cup final
4 years... many changes
In the UX, you live with a lack of knowledge:

- Often don’t know what caused the effect we see:
  - Was it the UI change?
  - Was it a seasonal effect?
  - Interaction with another experiment?
  - Is it due to content changing? (web content, ads…)

But with analytics, at least we have a chance!

But…
Run experiment… then...

- Some metrics up, some down…
- Things move together, things don’t move
- Analytics data interpretation is still far from a science
Sources of lossage

- Cookie churn causes loss of individuals
- Same cookie can represent multiple people
- Each individual can have multiple cookies!
  - How many cookies have you searched with today?
    - (In this crowd, probably 5 or so…)
All the stuff that changes…

- Underlying logging infrastructure changes all the time too

- Often can’t re-run an experiment because the web has changed, the logging has changed, the UI has changed…

  … so where’s your control?
“This scares me…..”

80% bounce rate
85% page visits < 5 seconds
80% → 43% bounce rate

50% page visits > 5 seconds

Successful queries 10X
Testing copy text variations

1. Advertise your business on Google
2. Get new customers with Google
3. Connect with new customers
4. Attract more customers
5. Reach new customers
N = 250K trials, period = 2 weeks

<table>
<thead>
<tr>
<th>Activity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertise your business on Google</td>
<td>0.0% (original)</td>
</tr>
<tr>
<td>Get new customers with Google</td>
<td>-0.37%</td>
</tr>
<tr>
<td>Connect with new customers</td>
<td>+0.55%</td>
</tr>
<tr>
<td>Attract more customers</td>
<td>+0.67%</td>
</tr>
<tr>
<td>Reach new customers on Google</td>
<td>+0.75%</td>
</tr>
</tbody>
</table>
Six variations on a text label
(n = 100K trials / variation; t = 1 week)

1. Sign up now » (original)
2. Begin »
3. Let's get started »
4. Click to start »
5. Start now »
6. Click to begin »

0.0% (original)
+21.3%
+14.9%
+23.7%
+15.4%
+24.4%
Which UI performs better in terms of conversion rate?

What matters here?

- **Big lesson:** **EVERYTHING** matters

- **Color choice**
- **Visual complexity**
- **Text choice**
- **Vertical position**
- **Horizontal position**
- **Iconography**
- **Form, balance…**
Biggest counterintuitive surprise:

**Not speed kills, but SLOW kills:**

- 500 millisecond delay causes 20% drop in clicks
- 400 ms delay causes 0.6% drop in searches / user / day
- Effect is profound even for 100 ms
Role of design?

- **What it’s always been:**
  - To help guide the design of the user experience
  - We can’t test everything, so we still need to make choices
  - Skill of design is to make choices

Role of analytics?

- **Newly emerging:**
  - To help guide the design of the user experience
  - Test the variations that we don’t understand
  - Discover the counterintuitive
  - Skill of analytics is to create a deeper understanding about why people act as they do