

What are they thinking?

Searching for the mind of the searcher

Joint Conference on Digital Libraries

Vancouver, British Columbia

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June 27, 2007

Title: What are they thinking? Searching for the mind of the searcher

Abstract: We are in a new age of being able to understand what people are doing when trying to search. With internet search engines in common and constant use, we also have a new challenge to understand what people are really searching for, and what it is they want to do. Whatever people are doing, it's certainly not the same as the older models of search. How are people searching on Google? What are they thinking when they make certain queries? What is their intent? How can we discern what that intent really is?

In this talk I'll describe some of the ways we're working to understand what people are really doing, and why they're doing it that way. The goal of this work is to vastly improve the searcher use-experience by understands the minds of millions of searchers.

Bio: Daniel M. Russell is an Über Tech Lead for Search Quality & User Happiness at Google. In this job, Dan studies Google searcher behavior using a variety of methods to get closer to the real experience of searching. Most recently, Dan was a senior scientist and senior manager at the IBM Almaden Research Center in San Jose, California. He is best known for his work on IBM's Blueboard system (a large shoulder-to-shoulder collaboration system) and for establishing the basis of sensemaking theory while at Xerox PARC (work with Stu Card, Mark Stefik and Peter Pirolli). In addition to IBM and PARC, Dan has also worked in Apple's Advanced Technology Group, and taught at both Stanford and Santa Clara Universities. He enjoys word play, music, and long distance running, becoming disgruntled when all three can't be in one day.



[jaguar]

[iraq]

[latest release Thinkpad drivers touchpad]

[ebay]

[first]

[google]

[brittttteny spirs]

- How can we figure out what you're trying to do?
- The information signal is sometimes weak:

00:12 [actor most oscars]

00:10 So this is celebrity with most Oscars...
00:11 Actor... ah... most...
00:13 I'm just going to try that...most Oscars...
don't know...
00:19 (reading) "News results for 'actors most Oscars' ... "
huh..
00:25 Oh, then that would be currently
"Brokeback" ... "prior voices" ... "truth in
Oscar's relevance"...
00:32 ...now I know...
00:35 ... you get a lot of weird things..hold on...
00:38 "Are Filipinos ready for gay flicks?"
00:40 How does that have to do with what
I just....did...?
00:43 Ummm...
00:44 So that's where you can get surprised...
you're like, where is this... how does
this relate...umm...
00:45 Bond...I would think...
00:46 So I don't know, it's interesting...
01:08 **Dan:** Did you realize you were in
the News section?
01:09 Oh, no I didn't. How did I get that? ...
01:10 Oooh... no I didn't.

1:15 [actor most oscars Academy]

How to be literate user of a UI?

- How does one make sense of a user interface?
 - What's interactive? What's live?
 - What do various actions do?
 - What model does user have of UI?
 - Groups / Functions / Overall operation / Gestalt

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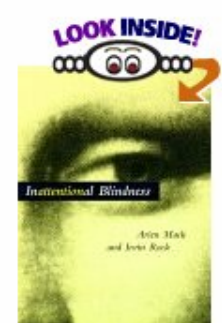
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Daniel M. Russell
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- ☐ Two Day Shipping (2 business days)
- ☐ One Day Shipping (1 business day)

The following items will arrive in 1 shipment:

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Estimated ship date for this item: January 18, 2003 - January 20, 2003

Order Summary

Items:	\$60.00
Shipping & Handling:	\$3.99
Total Before Tax:	\$63.99
Estimated Tax:	\$0.00

Order Total: \$63.99

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Payment Method:

[Change](#)

Mastercard: ***-12347

Search on:	Search for:	Directory:
Name	soders*, c	ALL



Name	Tie Line	Email Address	Job Responsibility
------	----------	---------------	--------------------

No matches found.

Please check the [Help](#) page to make sure you entered the search string properly.

Search on:	Search for:	Directory:
Name	soders*, c	ALL

Name	Tie Line	Email Address	Job Responsibility
------	----------	---------------	--------------------

No matches found.

Please check the [Help](#) page to make sure you entered the search string properly.

Invisible UI elements



[Web](#) [Images](#) [Video](#) [News](#) [Maps](#) [more »](#)

library database ui

Search

[Advanced Scholar Search](#)
[Scholar Preferences](#)
[Scholar Help](#)

Scholar All articles - [Recent articles](#)

All Results

[H Korth](#)

[A Silberschatz](#)

[V Basili](#)

[I Bruno](#)

[V Ogle](#)

[User interface modeling in UMLi](#) - [all 10 versions »](#)

PP da Silva, NW Paton - Software, IEEE, 2003 - [ieeexplore.ieee.org](#)

... This article examines some of UML's **user interface** modeling facilities. ... can provide a combination of a book's properties for querying a **library database**. ...

[Cited by 43](#) - [Related Articles](#) - [Web Search](#) - [BL Direct](#)

[book] **Database** Design - [all 2 versions »](#)

GC Wiederhold - 1977 - McGraw-Hill, Inc. New York, NY, USA

[Cited by 163](#) - [Related Articles](#) - [Web Search](#) - [Library Search](#)

[book] **Database** system concepts - [all 2 versions »](#)

HF Korth, A Silberschatz - 1986 - McGraw-Hill, Inc. New York, NY, USA

[Cited by 461](#) - [Related Articles](#) - [Web Search](#) - [Library Search](#)

[A digital library for geographically referenced materials](#) - [all 6 versions »](#)

TR Smith - Computer, 1996 - [ieeexplore.ieee.org](#)

... **library** services; and the ingest facility, for storing and processing data from new holdings. CUI means graphical **user interface**. ODBC means Open **DataBase** ...

[Cited by 97](#) - [Related Articles](#) - [Web Search](#) - [BL Direct](#)

Why is chron sort so hard? Compare...

```
@article{gross96dec,  
  title={{Demonstrating the Electronic Cocktail Napkin}},  
  author={Gross, M.D. and Do, E.Y.L.},  
  journal={ACM Human Factors in Computing-CHI},  
  volume={96},  
  pages={5--6} }
```

```
@article{mueller2005hod,  
  title={{Hug over a distance}},  
  author={Mueller, F. and Vetere, F. and Gibbs, MR and Kjeldskov,  
    J. and Pedell, S. and Howard, S.},  
  journal={Proc. CHI},  
  volume={5},  
  pages={1673--1676},  
  year={2005} }
```


So... what do we do?

- How do we understand what people are doing?
- Between inattention and low-signal density...

- **3M points-of-view:**

Micro: *lowest level details—milliseconds*

Meso: *mid-level observations—minutes to days*

Macro: *millions of observations—days to months*

WHAT are people doing?

① Field studies (meso)

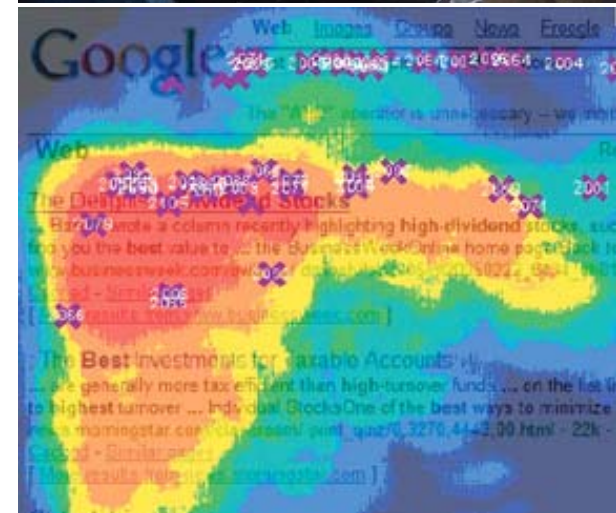
Getting out to see what reality is

② Eyetracking studies (micro)

Studies in the microscopic

③ Sessions analysis (macro)

What are people doing in logs,
bring outside behavior back to
where we can see the signals

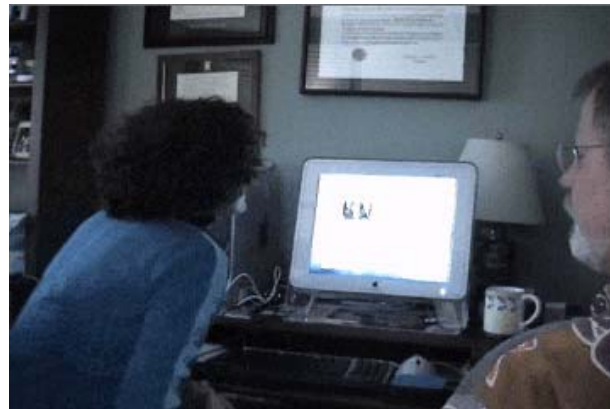
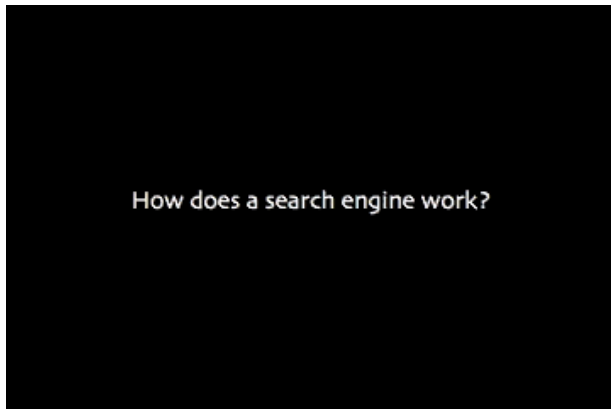


'URL
<http://www.google.com/ig?hl=en>
<http://127.0.0.1:4664/search?q=wardrobe+in+NBC&num=2&sz=po>
<http://www.google.com/search?hl=en&q=wardrobe+in+NBC>
<http://ad.doubleclick.net/adi/N339.cbshealthwatch/B1809262>
<http://adopt.specificclick.net/adopt.sm?i=1013290775&sz=po>
<http://www.cbsnews.com/stories/2004/07/01/entertainment/m>
<http://127.0.0.1:4664/search?q=wardrobe+in+NBC&num=2&sz=po>
<http://www.google.com/search?hl=en&q=wardrobe+in+NBC>
http://www.nbc.com/nbc/Will_&_Grace/wardrobe/frames/sear
http://www.nbc.com/nbc/Will_&_Grace/wardrobe/frames/si
http://www.nbc.com/nbc/Will_&_Grace/wardrobe/index.shtml
<http://127.0.0.1:4664/search?q=wardrobe+in+NBC&num=2&sz=po>
<http://www.google.com/search?hl=en&q=wardrobe+in+NBC>
<http://127.0.0.1:4664/search?q=will+and+grace+wardrobe+in+NBC>
<http://www.google.com/search?hl=en&lr=&safe=off&q=will+ar>
<http://www.nbc.com/nbc/footer/FAQ.shtml>
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http://www.nbc.com/nbc/Will_&_Grace/wardrobe/

1 Lies, Truth & Videotape — Field studies (meso)

- **Interviews held *in situ*...**

- Workplace, home, coffee shopany place... must be search-place
- Place + context cueing effects
- Interested in natural use phenomena (ads, distractions, multiple tasks...)



What we learn from field studies...

- How people think...
- Mental models
- Qualitative approaches
- Emotional reactions
- Expectations (and violations)
- WHY we're getting certain behaviors:
 - Example: why are 50% of clicks to Advanced Search page short?

② 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







3 Google Users video

The screenshot shows a Microsoft Internet Explorer browser window with the title "school backpacks - Google Search - Microsoft Internet Explorer". The address bar displays "http://www.google.com/search?q=school+backpacks". The search bar contains "school backpacks" and the "Search" button is visible. The results page shows "Results 1 - 10 of about 2,580,000 for school backpacks (0.19 seconds)".

Web

School Backpacks
www.eBags.com Get ready for school with the perfect bag! Free shipping.

Product search results for school backpacks

- Hello Kitty School Backpacks kbr102 - \$23.95 - Characterisland
- Obus Forme Ergonomic Kid's School Backpacks - \$49.99 - ComfortChairs.com
- Jansport Bivouac Backpacks (3000/3200 Cubic Inches) - \$139.99 - The Sports Authority

Best Back to School Backpacks and Daypacks
The best school backpacks and daypacks for children and teenagers. Find the best school backpacks designed with padded straps and to distribute the weight ...
walking.about.com/cs/backtoschool/tp/schoolpack.htm - 26k - [Cached](#) - [Similar pages](#)

The Best School Backpacks (August 2003)
Kids want hip styles. Parents want practical features. Check out these GH Institute-picked backpacks -- they offer something for everyone.
magazines.1village.com/goodhousekeeping/consumer/beauty/articles/0,,284522_585147_00.html - 70k - [Cached](#) - [Similar pages](#)

Lesson Tutor: Back Pack Troubles From Back-to-School Backpacks
You may want to think twice before putting on your child's backpack. New research reveals an alarming danger associated with improper childhood backpack ...
www.lesstutor.com/ss1.html - 18k - [Cached](#) - [Similar pages](#)

National School Backpack Awareness Day 2005 - Sept 21st
The American Occupational Therapy Association is a national professional society that advances the quality, availability, use and support of occupational ...
www.promoteot.org/AI_BackpackAwareness.html - 14k - [Cached](#) - [Similar pages](#)

school backpack

Sponsored Links

- School Backpacks**
Thousands of stores in one place. Find your school needs with Froogle
froogle.google.com
- L.L. Bean Backpacks**
Find backpacks, lunch boxes and messenger bags for every student.
www.llbean.com
- Office Depot Supplies**
Shop for School Supplies at Office Depot - Save When You Buy Online!
www.OfficeDepot.com
- Backpacks (Summer Sale)**
Jansport®, North Face, Dakine & More. Free Shipping. Save up to 60%
Backpacks.RockyMountainTrail.com
- the Backpacks warehouse**
Fine selection of backpacks from imported materials. Why pay retail?
www.a1aLeatherCases.com
- Backpacks at REI**
Find a Huge Selection of Backpacks. Free Shipping to REI Stores!
www.rei.com



So.. Did you notice the FTD official site?

To be honest, I didn't even look at that.

At first I saw "from \$20" and \$20 is what I was looking for.

To be honest, 1800-flowers is what I'm familiar with and why I went there next even though I kind of assumed they wouldn't have \$20 flowers

And you knew they were expensive?

I knew they were expensive but I thought "hey, maybe they've got some flowers for under \$20 here..."

But you didn't notice the FTD?

No I didn't, actually... that's really funny.

Interview video

Rapidly scanning the results

Note scan pattern:

Page 3:

Result 1
Result 2
Result 3
Result 4
Result 3
Result 2
Result 4
Result 5
Result 6 <click>

Q: Why do this?

A: What's learned later influences judgment of earlier content.

The screenshot shows a Google search results page for the query "children's unicycle". The search bar at the top contains the text "children's unicycle" and the Google logo is visible. Below the search bar, there are tabs for "Web", "Images", "Video", "News", "Maps", and "more »". The "Web" tab is selected, and the search results are displayed. A red arrow indicates a scanning pattern that starts at the top of the page, moves down to the first result, then zig-zags between the first and second results, then moves down to the third result, then zig-zags between the third and fourth results, then moves down to the fifth result, then zig-zags between the fifth and sixth results, and finally moves down to the sixth result. The results are numbered 1 through 6 in red circles on the left side of the page.

1 **Unicycle UK.com - F.A.Q. - What size?**
12" wheel **unicycle**: this is a small **children's unicycle** size. It's good for **children** who are too small to ride a 16" **unicycle**, but it needs smooth ground ...
www.unicycle.uk.com/FAQ.asp?iCategory=53 - 23k - [Cached](#) - [Similar pages](#)

2 **Selecting a unicycle: Unicycle.com NZ : buy a unicycle or learn ...**
16" wheel **unicycle**: this is a **children's unicycle**, the small wheel makes it only suitable for smooth areas. Best used indoors or on smooth ground; ...
www.unicycle.co.nz/View.php?action=Page&Name=Selecting_a_unicycle - 22k - [Cached](#) - [Similar pages](#)

3 **100 Miles for Kids - The Goal**
"The Afghan Mobile Mini Circus for **Children** is an established ... attempt to break the GUINNESS WORLD RECORD for the ONE HOUR UNICYCLE DISTANCE RECORD. ...
www.unicycle4kids.org/ - 9k - [Cached](#) - [Similar pages](#)

4 **Unicycles page at Juggling World**
This is a **children's unicycle**, the small wheel makes it only suitable for very smooth areas. Best used indoors or on smooth ground; not so good outdoors ...
www.jugglingworld.biz/shop/products_unicycles.html - 100k - [Cached](#) - [Similar pages](#)

5 **Buy a Unicycle: Unicycle.com AU : buy a unicycle or learn unicycling**
Check out a **Unicycle** Learners Pack for an easy and economical way to take your first steps into the One Wheeled World ... Suitable as a **Children's Unicycle**. ...
www.unicycle.au.com/View.php?action=Page&Name=Unicycles - 10k - [Cached](#) - [Similar pages](#)

6 **Article - News - A unicycle ride for children**
Adam Brody, 21, of San Juan Capistrano, led a charity event Saturday that benefits the Orangewood **Children's** Foundation. The **Unicycle** Club of Southern ...
www.ocregister.com/ocregister/news/homepage/article_1293785.php - 31k - [Cached](#) - [Similar pages](#)

How do users behave in search?

- Experiment conducted at Cornell [Gay, Granka, et al., 2004]
- *Users:*
 - Searched freely with any queries
 - Script removed all ad content
 - 5 info & 5 nav tasks given to participants
- *Subjects (Phase I)*
 - 36 undergraduate students
 - Familiar with Google

“zones” created around each result → eye-movements analyzed specific to the rankings



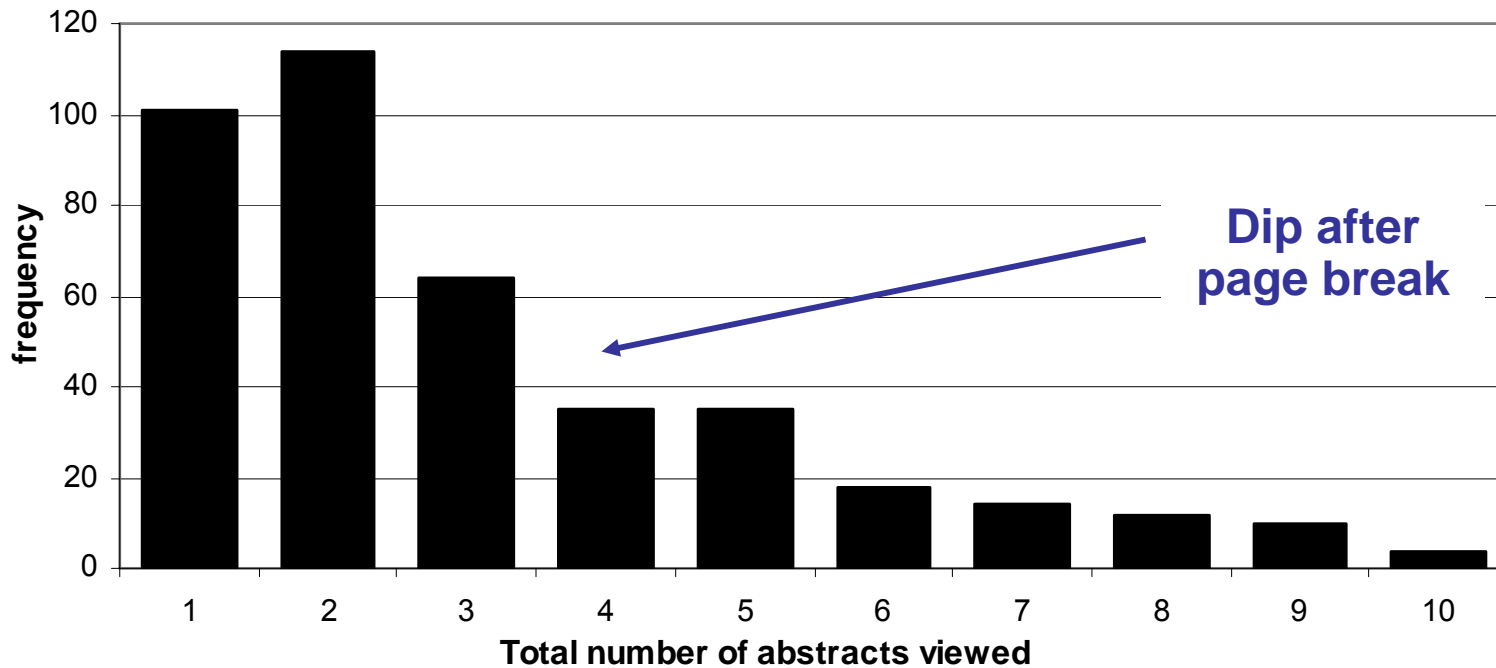
Skill of reading a SERP (search engine results page)

- How many results are viewed before clicking?
- Do users select the first relevant-looking result they see?
- How much time is spent viewing results page?



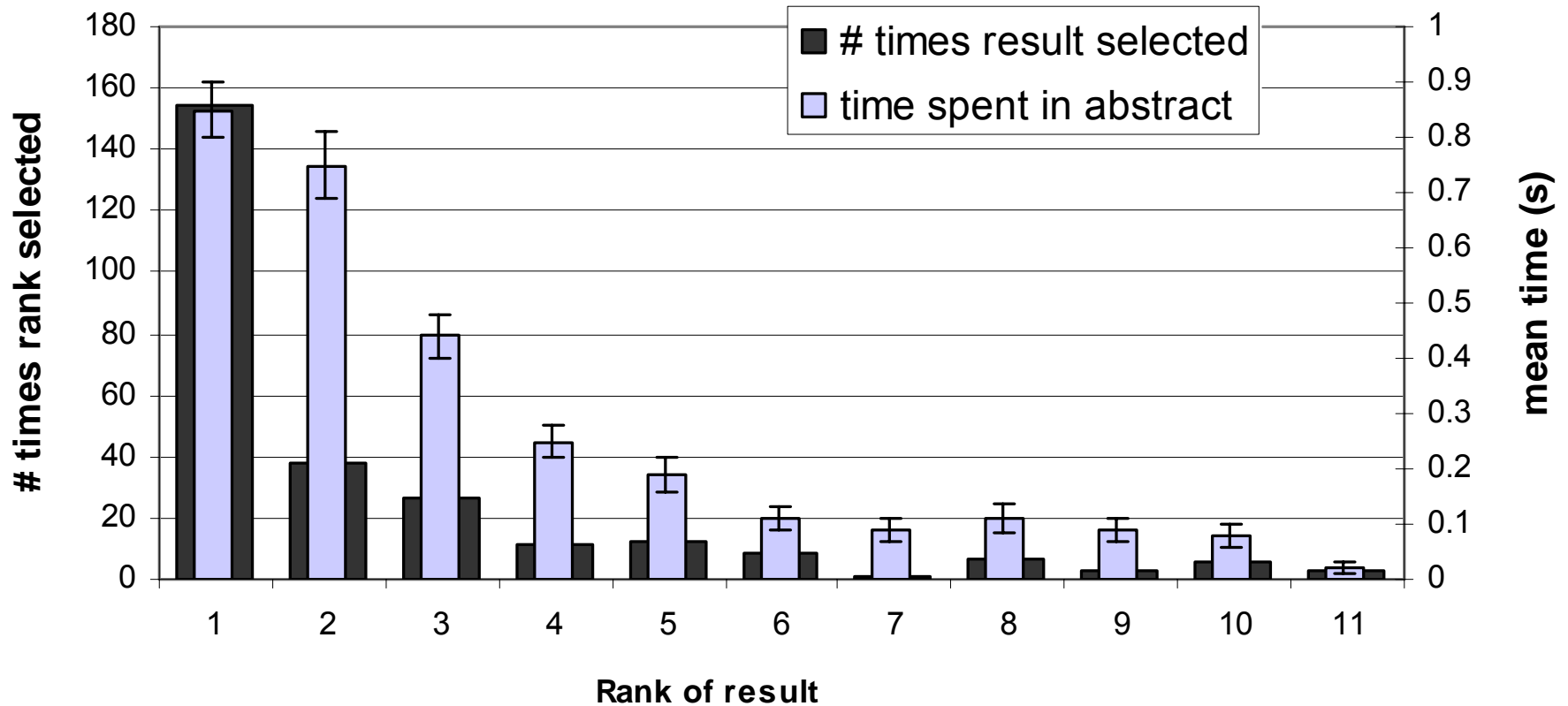
How many links do users view?

Total number of abstracts viewed per page



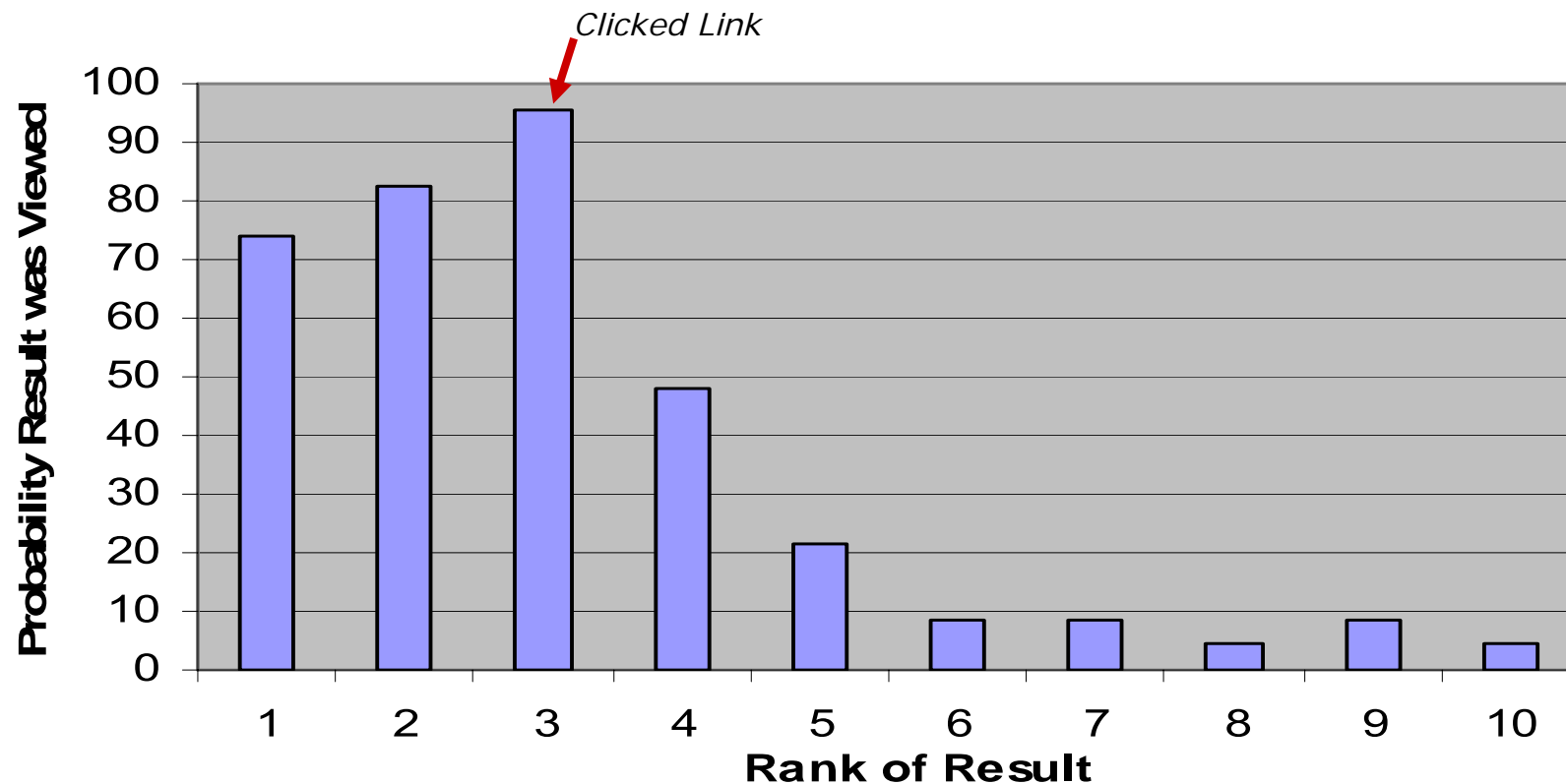
Mean: 3.07 Median/Mode: 2.00

Looking vs. Clicking



- Users view results one and two more often / thoroughly
- Users click most frequently on result one

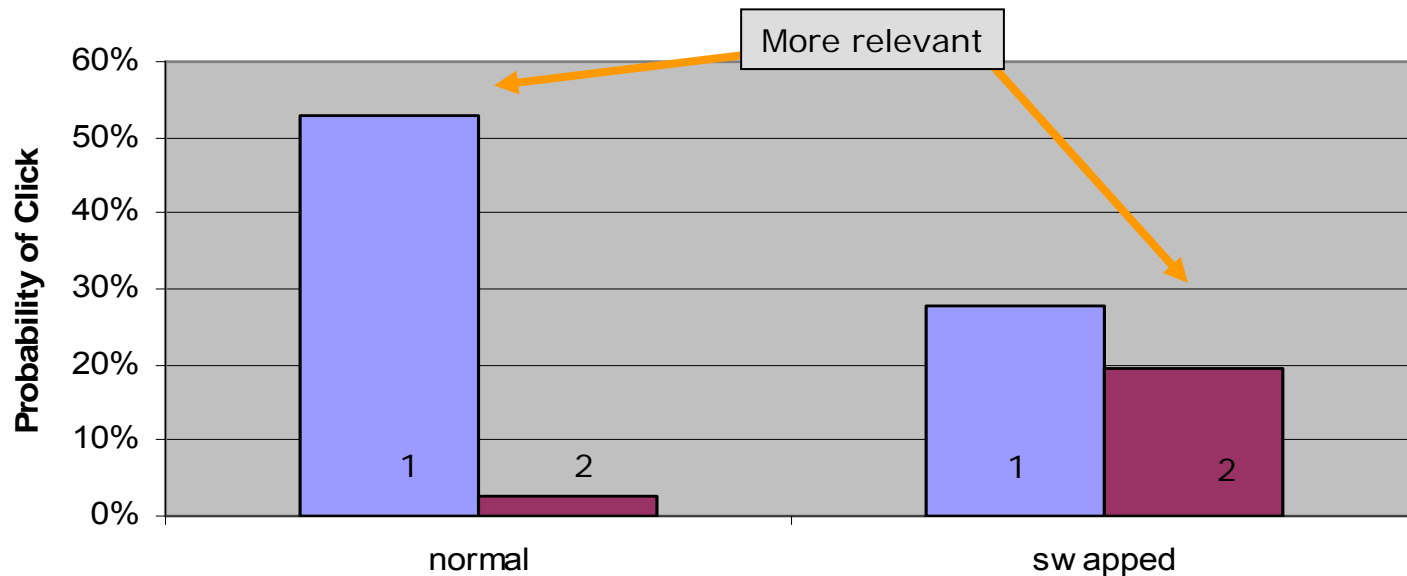
Which results are viewed before clicking?



- Users typically do not look at lower results before they click (except maybe the next result)

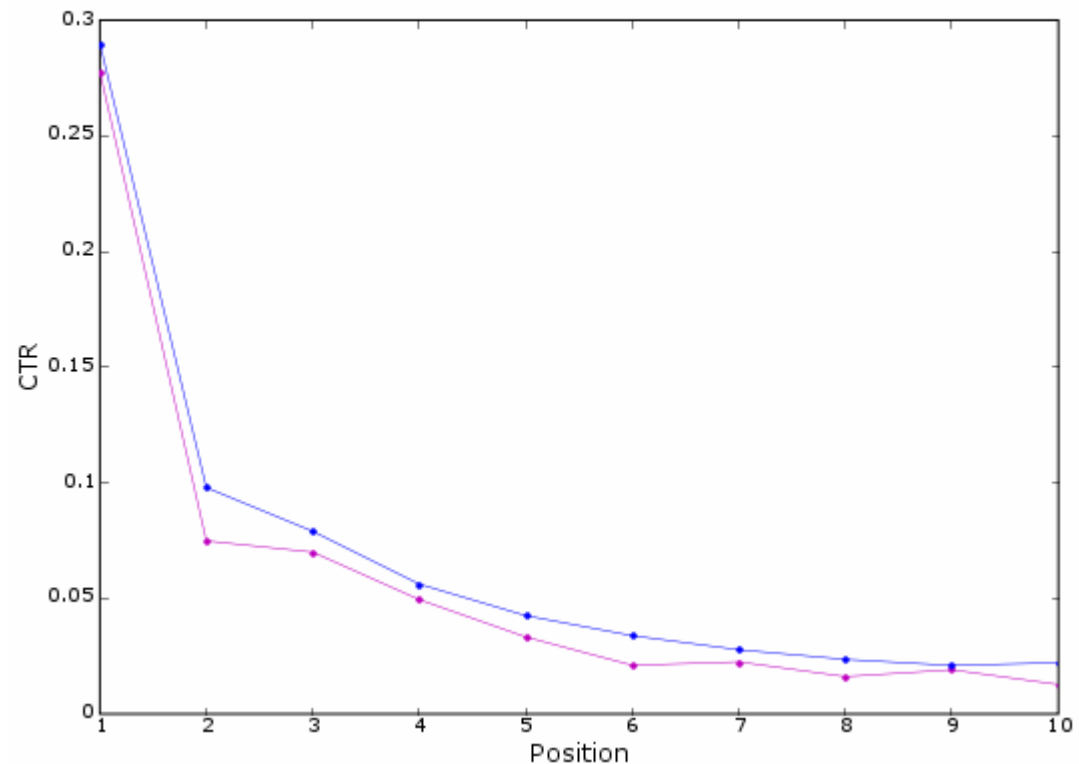
Presentation bias – reversed results

- Order of presentation influences where users look **AND** where they click



Strong implicit behavior...

- Users **strongly** believe that the search engine rank order matters



③ Macro: Understanding the behavior of the many

- **We have a lot of data: many GB weekly in logs**
- **How to analyze it?**
- **How to reduce it?**
 - What do you choose to forget?

A typical (long) session

- 31: Google Search [irish lotto] (4s)
- 33: Google Result 1 www.lotto.ie/ (7s)
- 34: Google Result 1 www.lotto.ie/ (4s) (DUPE) (p=31)
- 36: Nav (back/fwd) www.google.com/search (1s)
- 37: Google Result 2 www.irishlotto.net/ (2s) (p=31)
- 39: Nav (back/fwd) www.google.com/search (1s)
- 40: Google Result 3 www.irishlotto.net/main-results/2005.htm (1s) (p=31)
- 42: Nav (back/fwd) www.google.com/search (0s)
- 43: Google Result 4 www.irish-lottery.net/ (4s) (p=31)
- 44: Google Result 4 www.irish-lottery.net/ (5s) (DUPE) (p=31)
- 45: Google Result 4 www.irish-lottery.net/ (3s) (DUPE) (p=31)
- 48: Nav (back/fwd) www.google.com/search (6s)
- 49: Google Result 8 www.interlotto.com/irish/ (6s) (p=31)
- 51: Nav (back/fwd) www.google.com/search (1s)
- 52: Google Result 9 lottery.loquax.co.uk/irish-lottery.htm (21s) (p=31)
- 54: Nav casino.loquax.co.uk/ (29s)
- 55: Nav casino.loquax.co.uk/offers/173/Virgin-Casino.htm (4s)
- 56: Nav (new window) casino.loquax.co.uk/offers/173/Virgin-Casino.htm (0s)
- 57: Nav (new window) clkuk.tradedoubler.com/click (7s)
- 58: Nav (back/fwd) casino.loquax.co.uk/ (10s) (p=56)
- 59: Nav casino.virgingames.com/game/menu.do (15s) (p=57)
- 60: Nav (back/fwd) lottery.loquax.co.uk/irish-lottery.htm (0s) (p=58)
- 61: Google Search [irish lotto] (3s) (DUPE) (p=31)
- 63: Google Result 10 online.casinocity.com/lotteries/irish-lotto/ (11s)

Non-Google actions: “work” from the user’s pov

31: Google Search [irish lotto] (4s)

33: Google Result 1 www.lotto.ie/ (7s)

34: Google Result 1 www.lotto.ie/ (4s) (DUPE) (p=31)

37: Google Result 2 www.irishlotto.net/ (2s) (p=31)

40: Google Result 3 www.irishlotto.net/main-results/2005.htm (1s) (p=31)

43: Google Result 4 www.irish-lottery.net/ (4s) (p=31)

44: Google Result 4 www.irish-lottery.net/ (5s) (DUPE) (p=31)

45: Google Result 4 www.irish-lottery.net/ (3s) (DUPE) (p=31)

49: Google Result 8 www.interlotto.com/irish/ (6s) (p=31)

52: Google Result 9 lottery.loquax.co.uk/irish-lottery.htm (21s) (p=31)

61: Google Search [irish lotto] (3s) (DUPE) (p=31)

63: Google Result 10 online.casinocity.com/lotteries/irish-lotto/ (11s)

Evidence of multitasking

100: Google Search [free roulette] (4s) (DUPE) (p=78)

102: Google Result 7 www.getlyrical.com/general/free_casino_games/free_online_roulette.html (3s)

103: Google Result 7 www.getlyrical.com/general/free_casino_games/free_online_roulette.html (19s) (DUPE) (p=100)

106: Google Result 8 www.saliu.com/Roulette.htm (56s) (p=100)

112: Google Search [shockwave] (4s)

114: Google Result 3 www.shockwave.com/sw/home/ (10s)

117: Google Result 5 sdc.shockwave.com/shockwave/download/download.cgi (16s) (p=112)

120: Google Search [free roulette] (3s) (DUPE) (p=78)

122: Google Result 1 www.ildado.com/free_roulette.html (15s) (DUPE)

124: Google Search [free professional roulette] (2s)

126: Google Search (spell correct) [free professional roulette] (10s)

128: Google Result 3 imagesculptor.com/Roulette/free-roulette-professional-system.php (5s)

129: Google Result 3 imagesculptor.com/Roulette/free-roulette-professional-system.php (8s) (DUPE) (p=126)

133: Google Result 7 www.amazon.com/exec/obidos/tg/detail/-/B0007XRSQ4?v=glance (2s) (p=126)

User: 16925

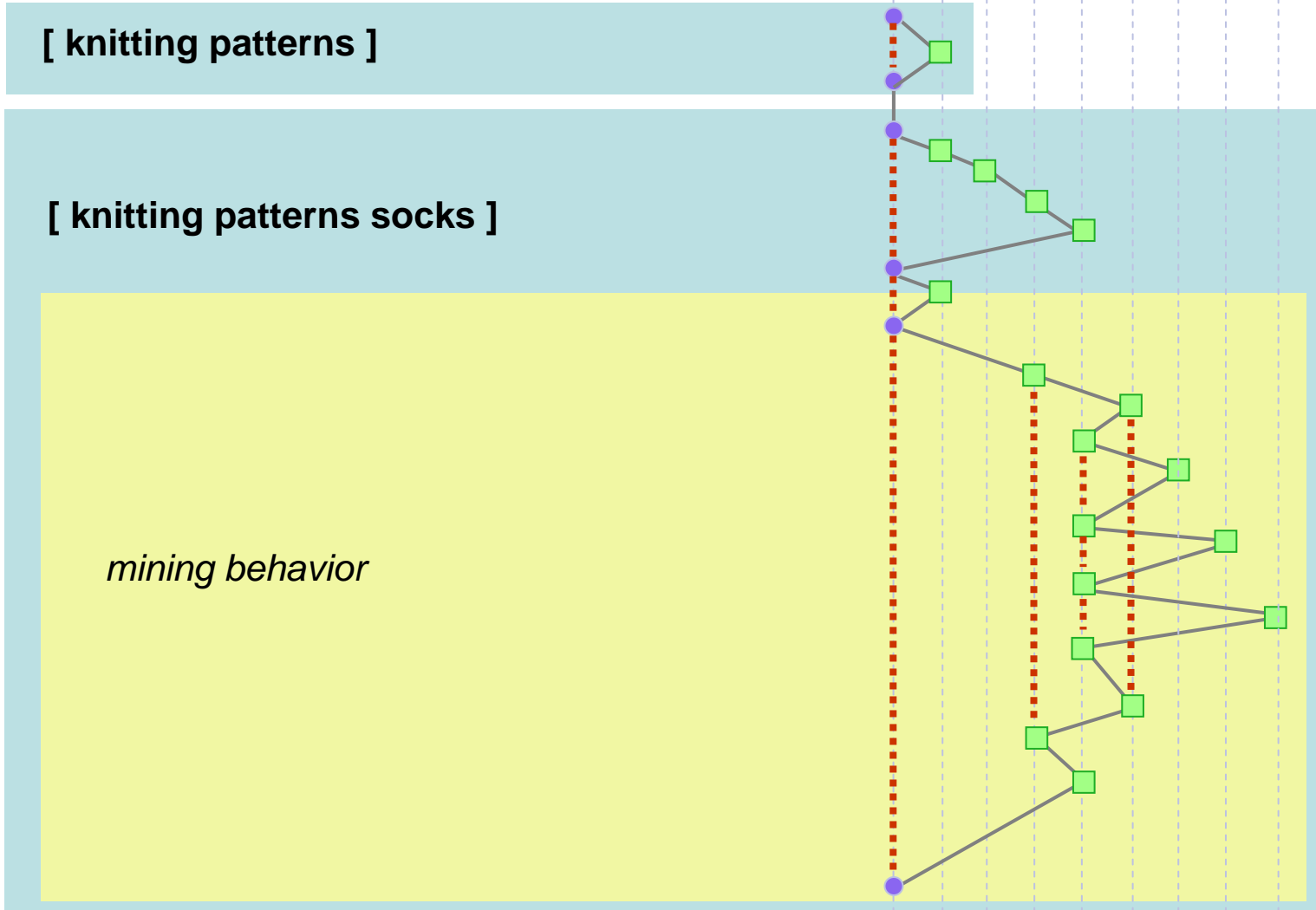
[knitting patterns]

[knitting patterns socks]

mining behavior

Time

- site page
- SERP
- same page



Kinds of behaviors we see in the data

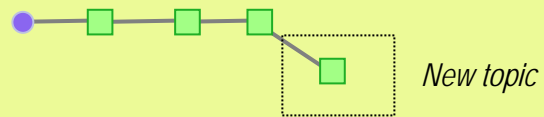
Short / Nav



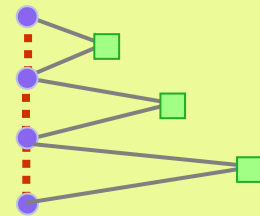
Topic exploration



Topic switch



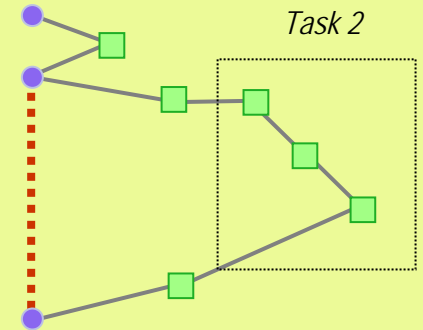
Methodical results exploration



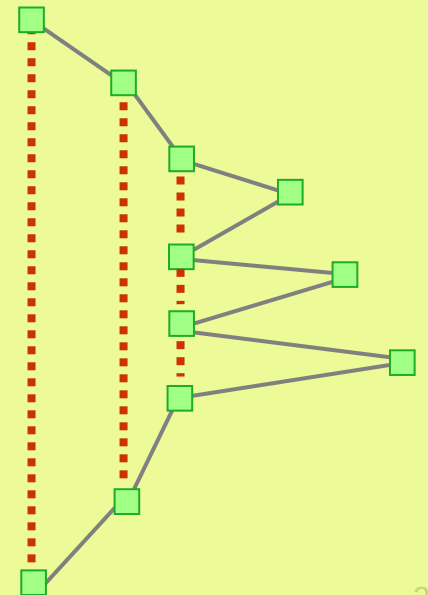
Query reform



Multitasking



Stacking behavior



Session patterns

- **Search is often a two-step process:**
 1. find or navigate to a good site (“orienteering”)
 2. browse for the answer there

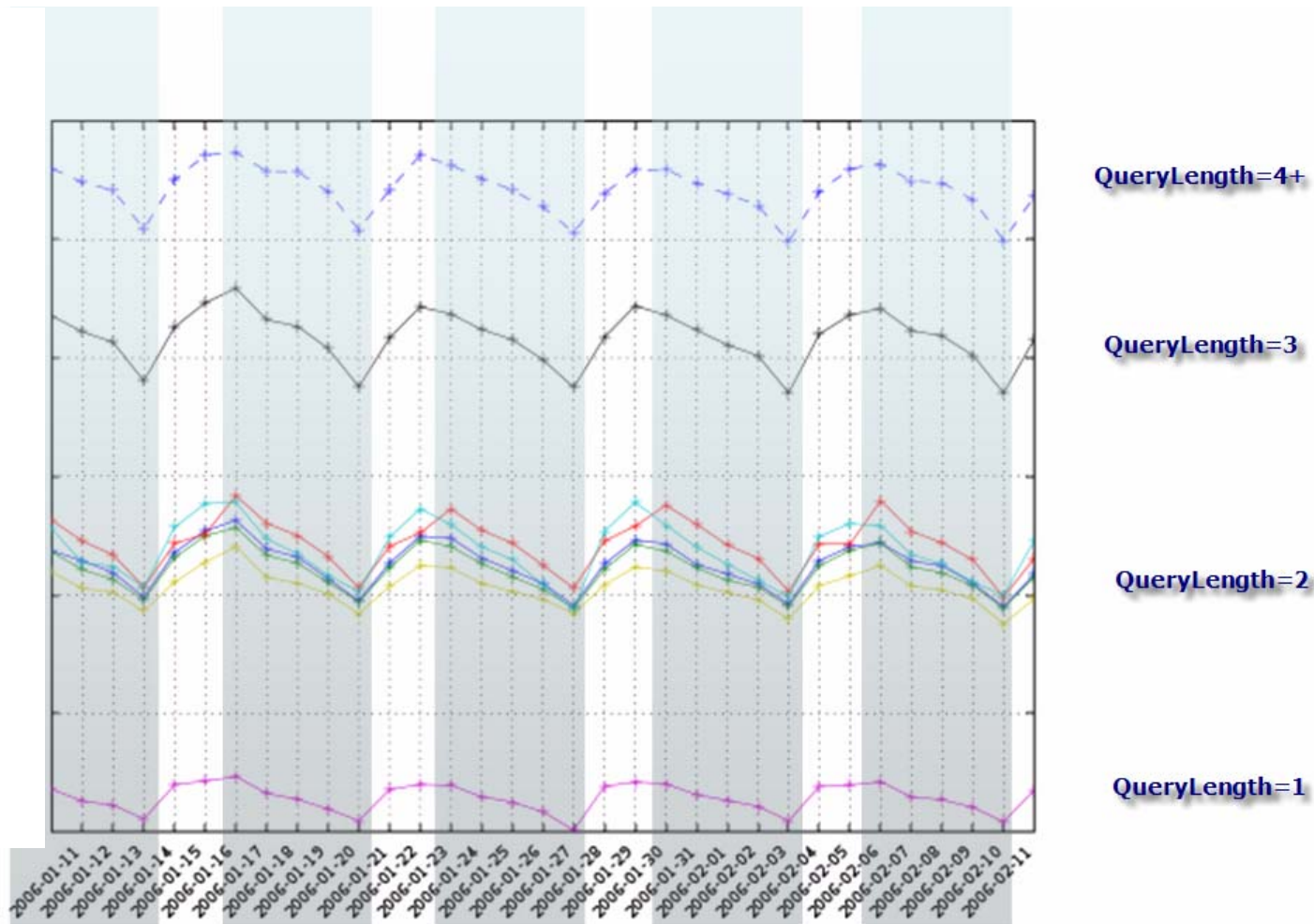
[actor most oscars] vs. [oscars]

- **Teleporting (the other strategy)**
 - “I wouldn’t use Google for this, I would just go to...”
- **Possible reasons:**
 - don’t realize that they can search for the information directly
 - formulating the query seems too hard
 - user trusts the source, rather than Google intermediary

To be a strong user...

- **Need to have fairly deep knowledge...**
 - What sites are possible
 - What's in a given site (what's likely to be there)
 - Authority of source / site
 - Index structure (time, place, person, ...) ➔ what kinds of searches?
 - *How to read a SERP critically*

Average session duration by query length over time



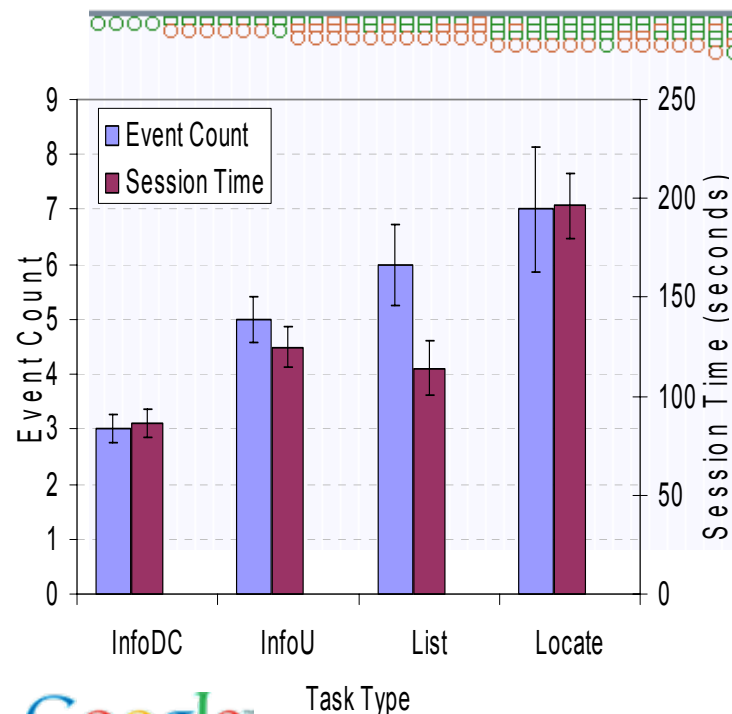
Measurable differences between different task types?

Informational/Directed/Closed

"Find a painting by Georges Seurat called 'La Grande Jatte'"

Informational/Locate

"Search for a man's watch that is water resistant to 100 meters and under \$100"



Main effect of task type on:

- **Event count**
(Kruskal-Wallis: $\chi^2(3)=368.3$; $p<.001$) and
- **Session time**
(Kruskal-Wallis: $\chi^2(3)=368.7$; $p<.001$)

Info Direct-Closed < Info Undirected <= List < Locate

► Mental models

- How **DO** people think about what a search engine does?
 - Completely keyword search?
 - Full-text indexing?
 - Partial-text indexing?
 - Link anchors?
- What **DOES** one need to know to use search effectively?
 - Relevance?
 - Keyword term frequency?
 - Layered index?
 - Spider / crawling?

Mental models 1

1. Predictable behavior
2. What content is indexed?
3. How does Google look it up?
4. How are the results ranked?
5. What's in the index? (different kinds of content)

Looking for an image

Google Web Images Groups News Froogle Maps

La Grande Jatte by Georges Seurat

Web

Product search results for **La Grande Jatte by Georges Seurat**

 Sunday Afternoon on the Island of La Grande Jatte by ... - \$419.99 - Ta
 Sunday Afternoon on la Grande Jatte by Georges Seurat - \$23.83 - Po
 La Grande Jatte by Georges Seurat Poster/Print - \$12.80 - eBay

WebMuseum: **Seurat, Georges**

Georges-Pierre Seurat was born on Dec. 2, 1859, in Paris. He studied at the E
 More details Un dimanche après-midi à l'Île de la Grande Jatte ...
www.ibiblio.org/wm/paint/auth/seurat/ - 7k - [Cached](#) - [Similar pages](#)

Froogle?

Scholar?

Google Web Images Groups News Froogle Maps Scholar more »

La Grande Jatte by Georges Seurat painting

Search [Advanced Search](#) [Preferences](#)

Web

Scholarly articles for La Grande Jatte by Georges Seurat painting

 On Concurrent Programming - Schneider - Cited by 55
 Chapter 13 Selfobject Theory and the Artistic Process - Rotenberg - Cited by 8

The Art Institute of Chicago: Art Access

The artist visited **La Grande Jatte** many times, making drawings and more than ... With his
 precise method and technique, **Seurat** conceived of his painting as ...
www.artic.edu/artaccess/AA_Impressionist/pages/IMP_7.shtml - 14k - [Cached](#) - [Similar pages](#)

	URL	Title	Search Word(s)
4	525	http://www.google.com/search?hl=en&q=La+Gran...	La Grande Jatte by Georges Seurat - Go...
5	530	http://froogle.google.com/froogle?q=La+Grande+J...	Froogle Search: La Grande Jatte by Geor...
6	542	http://froogle.google.com/froogle_url?q=http://ww...	A Sunday on La Grande Jatte, 1884 Post...
7	553	http://froogle.google.com/froogle?q=La+Grande+J...	Froogle Search: La Grande Jatte by Geor...
8	555	http://www.google.com/search?hl=en&q=La+Gran...	La Grande Jatte by Georges Seurat - Go...
9	560	http://www.google.com/search?hl=en&lr=&q=La+...	La Grande Jatte by Georges Seurat paint...
10	573	http://scholar.google.com/scholar?hl=en&lr=&sa=...	La Grande Jatte by Georges Seurat paint...
11	576	http://www.google.com/search?hl=en&lr=&q=La+...	La Grande Jatte by Georges Seurat paint...
		WebMuseum: Seurat, Georges	
		/gran...	WebMuseum: Seurat, Georges: Un dima...
		/	WebMuseum: Seurat, Georges
		=La+...	La Grande Jatte by Georges Seurat paint...
		atte.jp...	Seurat, A Sunday Afternoon on the Island...
		ml	Georges Seurat
		=0&in...	Special Discounts and Offers
		atte.jp...	Special Discounts and Offers
		=0&in...	Special Discounts and Offers
		=0&in...	Special Discounts and Offers
		atte.jp...	Seurat, A Sunday Afternoon on the Island...

for an image here...

Many ways to ask about a painting... many ways to respond...

Query Terms	OneBox	First Google search result
georges seurat "la grande jatte"	None	The Art Institute of Chicago: Art Access
georges seurat la grande jatte	None	The Art Institute of Chicago: Art Access
"la grande jatte"	None	Seurat, A Sunday Afternoon on the Island of La Grande Jatte
la grand jatte	None	The Art Institute of Chicago: Art Access
george seurat, la grande jatte	None	WebMuseum: Seurat, Georges
george seurat "la grande jatte"	None	The Art Institute of Chicago: Art Access
painting la grand jatte	None	The Art Institute of Chicago: Art Access
"la grande jatte by georges seurat"	None	Sunday Afternoon on the Island of La Grande Jatte Posters by
...		
george seurat la grande jatte	None	Webmuseum: Seurat, Georges
georges seurat painting	None	Webmuseum: Seurat, Georges
la grande jatte	Image	The Art Institute of Chicago: Art Access
la grande jatte georges	Product	The art institute of Chicago
la grande jatte by georges seurat	Product	Webmuseum: Seurat, Georges
georges seurat painting grande jatte	Product	The Art Institute of Chicago: Art Access
la grande jatte painting	Product	Seurat, A Sunday after noon on the island
painting la grand jatte seurat	Product	The Art Institute of Chicago: Art Access
seurat la grande jatte pic	Book	FlickrBlog
la grande jatte by george seurat	Book	Webmuseum: Seurat, Georges
seurat la grande jatte image	Book	Webmuseum: Seurat, Georges
La Grande Jatte by Georges Seurat painting	Scholar	The Art Institute of Chicago: Art Access

...with many OneBoxes...



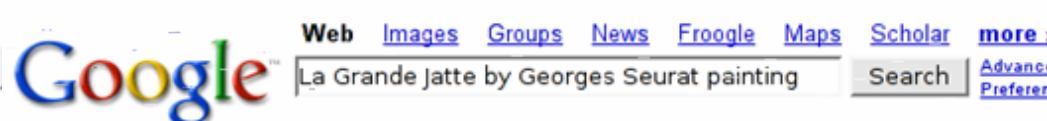
Web

Book results for [la grande jatte by george seurat](#)

 [Enchanted Evenings](#) - by [Geoffrey Block](#) - 410 pages
[Painting and Sculpture in Europe 1880-1940](#) - by [George Heard Hamilton](#)

WebMuseum: [Seurat, Georges](#)

His famous canvas Sunday Afternoon on the Island of the **Grande Jatte** was the of an exhibition in 1886. By then **Seurat** was spending his winters ...
[www.ibiblio.org/wm/paint/auth/seurat/](#) - 7k - [Cached](#) - [Similar pages](#)



Web

Scholarly articles for [La Grande Jatte by Georges Seurat painting](#)

 [On Concurrent Programming](#) - [Schneider](#) - Cited by 55
[Chapter 13 Selfobject Theory and the Artistic Process](#) - [Rotenberg](#) - Cited by 8

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The artist visited **La Grande Jatte** many times, making drawings and more than ... With his precise method and technique, **Seurat** conceived of his painting as ...
[www.artic.edu/artaccess/AA_Impressionist/pages/IMP_7.shtml](#) - 14k - [Cached](#) - [Similar pages](#)



Web

Image results for [la grande jatte](#)



The Art Institute of Chicago: Art Access

A Sunday on **La Grande Jatte**—1884, 1884-86. Oil on canvas. 207.5 x 308 cm ... The artist visited **La Grande Jatte** many times, making drawings and more than 30 ...
[www.artic.edu/artaccess/AA_Impressionist/pages/IMP_7.shtml](#) - 14k - [Cached](#) - [Similar pages](#)



Web

Product search results for [la grande jatte georges](#)

 [Georges Seurat Sunday Afternoon Island La Grande Jatte](#) - \$2.99 - [eBay](#)
["Sunday Afternoon on la Grande Jatte." Georges Seurat ...](#) - \$1.99 - [EaselWeasel.com](#)
[Sunday Afternoon on the Island of La Grande Jatte by ...](#) - \$419.99 - [Target](#)

The Art Institute of Chicago: Art Access

Georges Seurat. French, 1859-1891 ... The artist visited **La Grande Jatte** many times, making drawings and more than 30 oil sketches to prepare for the final ...
[www.artic.edu/artaccess/AA_Impressionist/pages/IMP_7.shtml](#) - 14k - [Cached](#) - [Similar pages](#)

What's the mental model of oneboxen?

- It's magic:

"... I don't know how to make it come back..."

"... why does this... thing... keep being at the top?"



Mental model 2: We are all cargo cultists



Mental model 3

1. Predictable behavior *Can I predict what will happen when I do X?*
2. How is content indexed? *Is it full-text? How are images indexed?.....*
3. How does Google look it up? *Which keywords should I pick?*
4. How are the results ranked? *What does the order mean?*
5. What's in the index? *What kinds of documents can I search?*

► Culture of search 1

- What does it mean to Google something?
"...let me google this on Yahoo..."
- How does always available search change your conversations?



Culture of search 2

- Has ubiquitous search changed expectations about knowledge?

Type 1: **Eternal verities** ($F = ma$; Antarctica is a continent)

Type 2: **Mid-term** (Sacramento is the capital of California; there are 117 elements)

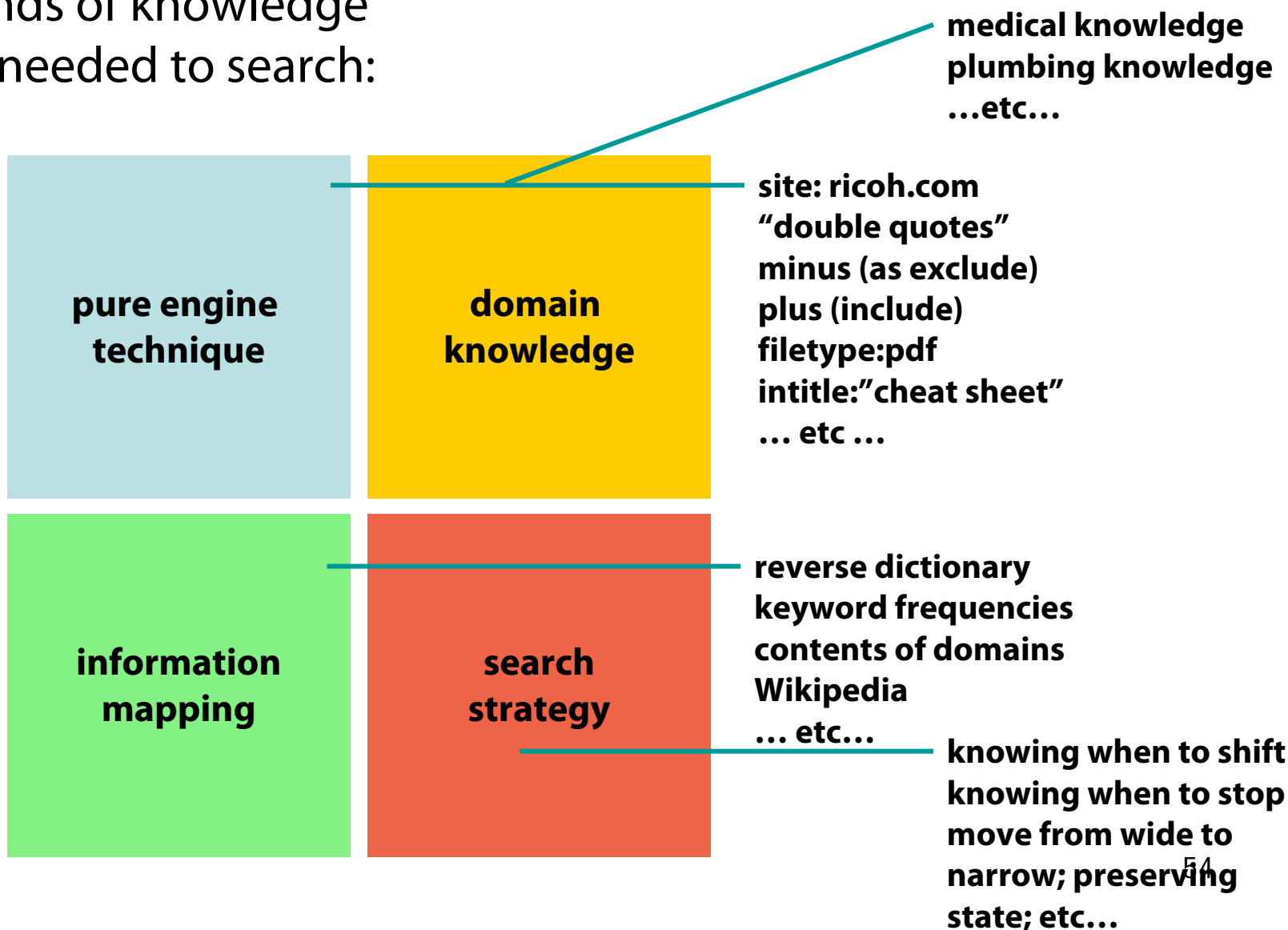
Type 3: **Ephemera** (my IP address is 9.1.2.142; use Muggle.google.com for your proxy)

Culture of search 3

- Key question: What do you *really* need to know?
 - recognition knowledge?
 - contextual knowledge?
- When the cost of discovery and access is low...
does that change your expectation
of others?

► A new literacy

- Four kinds of knowledge & skills needed to search:



- **Search engines will continue to change**
 - change is constant...
new document types, new searches, new possibilities
 - that's the point of all our studies / testing
 - things will continue to change rapidly
- **Search engines need to match capabilities with user expectations and understandable user mental models**
 - need to continually refine understanding of user population's mental models
 - need to detect when a particular model is in play

- **For search engines:**
 - To create a system that behaves predictably
 - To understand expectations of entire breadth of users
- **For our users:**
 - To learn the basics of how search engines work
 - To have a functional mental model

- **For the digital library community:**
 - To educate our users in broadly effective models of

**research
content
organization**

... and how to evolve...

END