



Social Analytics @ Google

David Huffaker, Ed H. Chi



Two Ways of Studying Social Networks

(1) Large scale techniques such as SNA help with understanding broad regularities.

- Network science and surprising regularities on how users behave in social systems.
- Help us understand what statistical models and techniques to use to describe broad user behavior.

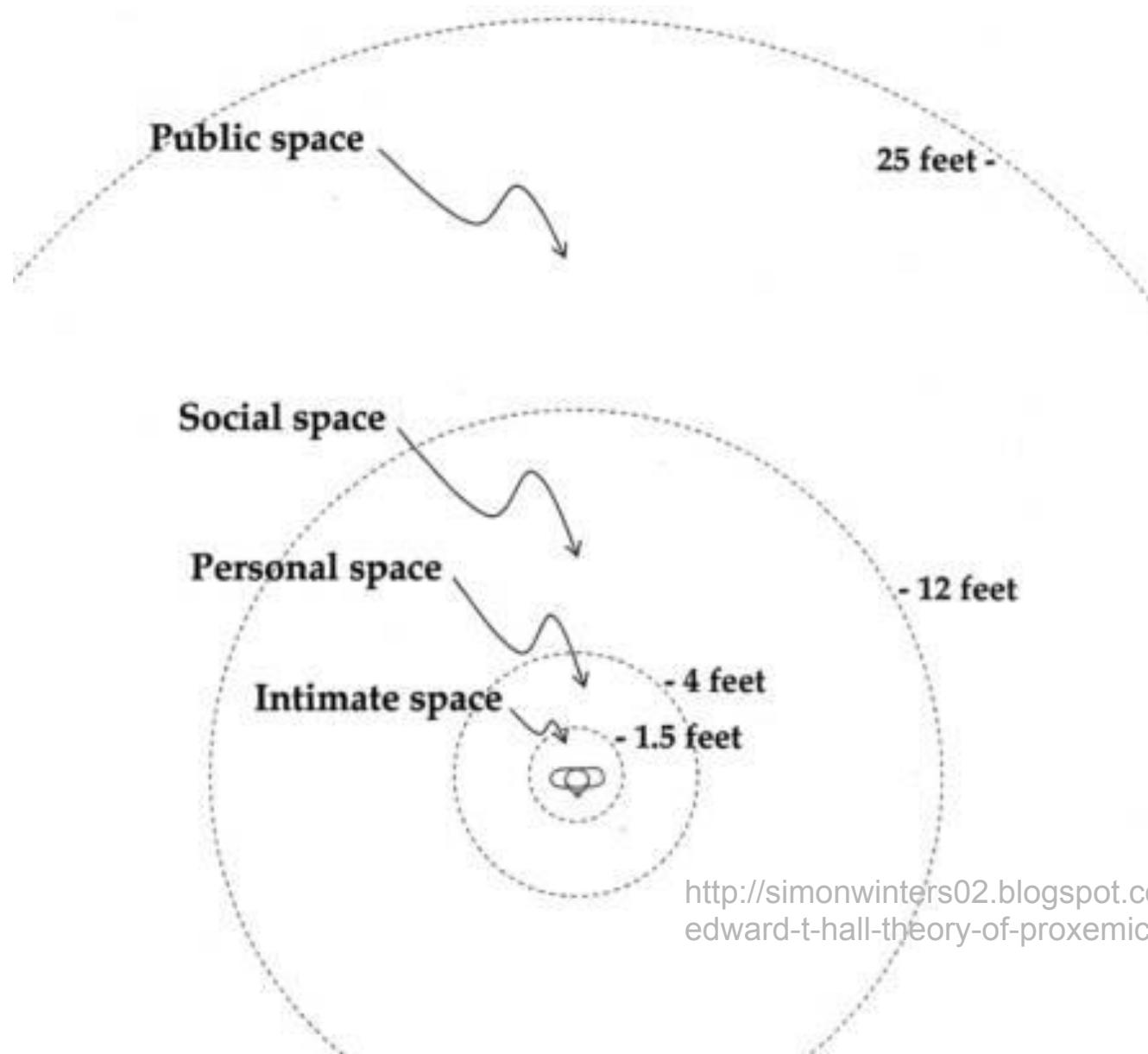


Two Ways of Studying Social Networks

(2) Networks form from millions of user interactions.

- Understanding user interactions at the micro-level helps understand why social relationships form.
 - From perception to cognition to decision making
 - Perception of social information
 - Representation of self to others
 - Decision making under social proof and peer pressure

Edward Hall's Proxemics



<http://simonwinters02.blogspot.com/2009/11/edward-t-hall-theory-of-proxemics-and.html>

How relationship form and what they mean...



The screenshot shows a Google+ profile page for a user named "Kathy". The top navigation bar includes Home, Profile, Circles, Photos, Events, Hangouts, Mobile, Local, Sign in or Join Google+, and a 276k follower count badge. The main content area features a large image of various fruits and vegetables. A sharing dialog box is overlaid, showing options to share with "Friends (15)" or "Family (4)". A large circular callout highlights the "Share" button. To the right of the sharing dialog, there's a summary of the user's activities: "Works at Coastline Sportswear", "Attended Michigan State University", and "Lives in Portland, Oregon". Below this, a section titled "20 IN YOUR CIRCLES" shows thumbnail images of 12 other users. At the bottom right, it says "8 HAVE YOU IN CIRCLES".



Selective Sharing in G+

Research Questions

How are users utilizing **Circles** to organize their social networks?

What **motivates** users to share content?

What decisions do users make about **audience** choices?

Methodology

User logs

100,000 randomly sampled active users over 7 days

Top 1,000 Circle names

Survey (N = 168)

Active users on G+ (recruitment posted G+); 56% response rate.

Interviews (N = 12)

Talking in Circles: Selective Sharing in Google+.

Sanjay Kairam, Michael J. Brzozowski, David Huffaker, Ed H. Chi. *In Proc. of CHI'2012.*

Three-quarters of users engaged in selective sharing.

	% Users	% Items
Public	33.9%	33.8%
Circles	74.8%	67.6%
Individuals	10.3%	5.8%

Popular circle names center on life facets or tie strength.

	Work	School	Strong	Weak	Other
Top 10	74.1%	13.8%	7.2%	0.0%	4.9%
Top 100	47.5%	16.0%	9.0%	3.5%	24.0%
Top 1000	31.4%	12.6%	8.8%	4.0%	43.1%

Talking in Circles: Selective Sharing in Google+. Sanjay Kairam, Michael J. Brzozowski, David Huffaker, Ed H. Chi. In Proc. of CHI'2012.



church

music

google

tech

twitter

photographer

s

celebrities

news

relatives

Why do people share?

Inherent value of content (60%)

Content is deemed useful, cool, funny, interesting

Desire to share about oneself (26%)

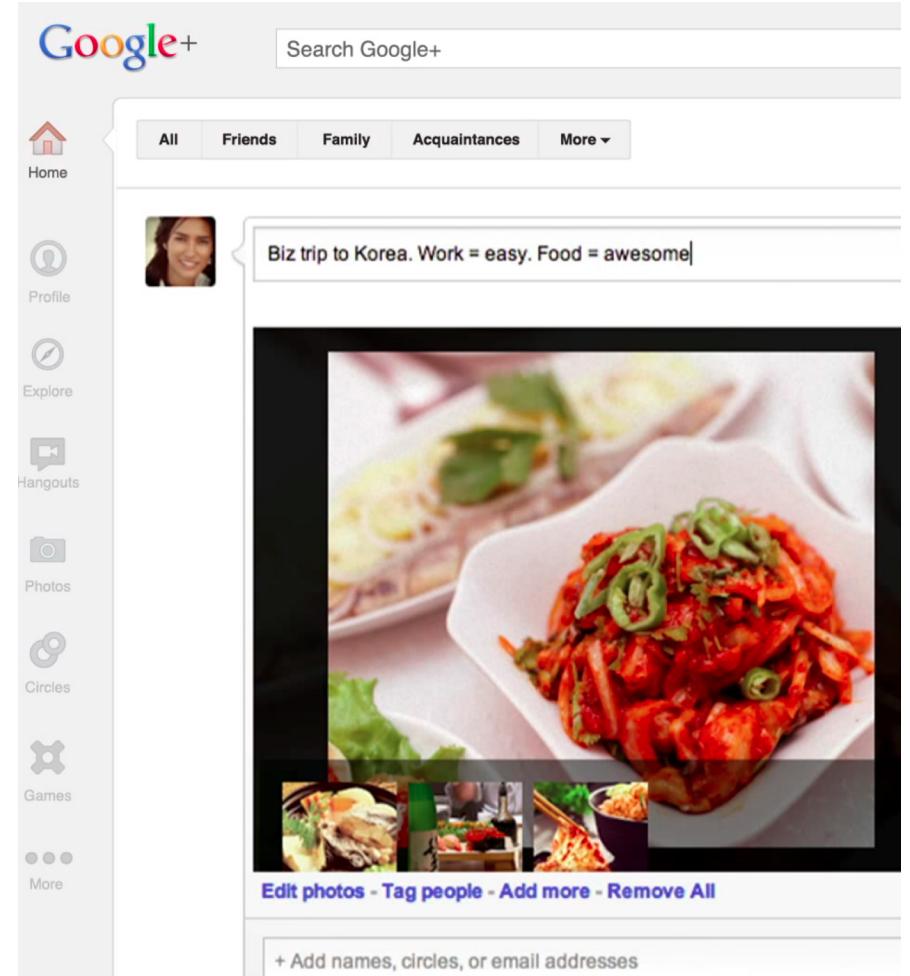
Expressing an inherent desire to relate one's personal experiences and opinions to others; from brief updates to long posts with emotional content

Discourse (17%)

Desire to start or participate in a conversation (e.g., current events);
Soliciting help or information from others

Evangelism (7%)

Intention to spread information about specific events or work being conducted by others



Talking in Circles: Selective Sharing in Google+.

Sanjay Kairam, Michael J. Brzozowski, David Huffaker, Ed H. Chi. In Proc. of CHI'2012.

How do they select an audience?

Privacy (22%)

Focused on risks to self over others; breakdown of users who are "public by default" and "private by default"

Relevance (23%)

Targeting content to those who think it might be interested (e.g., a joke that only your college buddies get; pics from family vacation); want to avoid spam or polluting others' streams

Distribution (43%)

Maximize the potential audience; expand their own audiences



Talking in Circles: Selective Sharing in Google+.

Sanjay Kairam, Michael J. Brzozowski, David Huffaker, Ed H. Chi. In Proc. of CHI'2012.



Users
make use of **circles**
to manage **context** of
sharing different pieces of **content**.

Social Media Holy Trinity:
Content, Audience, Context

"Social" is a layer across all of Google.

Google Inside Search

Home Tips & Tricks **Features** Search Stories Playground Blog Help

Search plus your world Flight Search Related Search Previews Search by Image Voice Search Google Instant Knowledge

Search, plus Your World

Your photos, your friends, your stuff...

Search has always brought you information from across the web. Now, search gets better by including photos, posts, and more from you and your friends. When signed in with Google+, you'll find personal results and profiles of people you know or follow. You can even expand your world by discovering people related to your search.

[Upgrade to Google+](#)

Already on Google+? Sign in and try searching on Google for something that will give you personal results, like your hometown.

A quick look at personal results

A little help from your friends

We all turn to people we know and trust for great recommendations. With personal results, you'll see relevant tips, photos, and posts from your friends right alongside results from the web.

Just for you

Personal results are marked with a icon so you know they're just for you. Because these results are personal and private, you'll need to be signed in to Google to see them.

Control what you see

On any given search, you can toggle to hide personal results. To do this, simply click on the icon in the top right of your search results page.

[Learn more about personal results](#)

Search, plus Your World

Who knew paperclips were so awesome? I DID
<https://plus.google.com>

David Sealey - Nov 15, 2011 - Limited
How to build a bow and arrow and arrow covariance



How to Keep Track of Your Cellphone Data Usage

lifehacker.com/5557836/the-best-tools-for-monitoring-your-cellphone-data-usage

Jun 8, 2010 – There are many, many **bandwidth monitoring** tools available for all three ...

Lifehacker Pack for Android: Our List of the Best Android Apps ...



Shared by [Minjiao Jiang](#)

Study #1 - Tasks

- 18-20 Organic search tasks with Half "social"
 - Designed to bring up real annotations (via impersonation tool)
- Tasks spanned 6-8 topics
 - local services/restaurants
 - products
 - how to's
 - fact-finding
 - navigation
 - (news, entertainment) *not all participants*
- Examples:
 - (local) "Find a good French restaurant in Palo Alto"?
 - (how-to) "How do you make a box kite"?



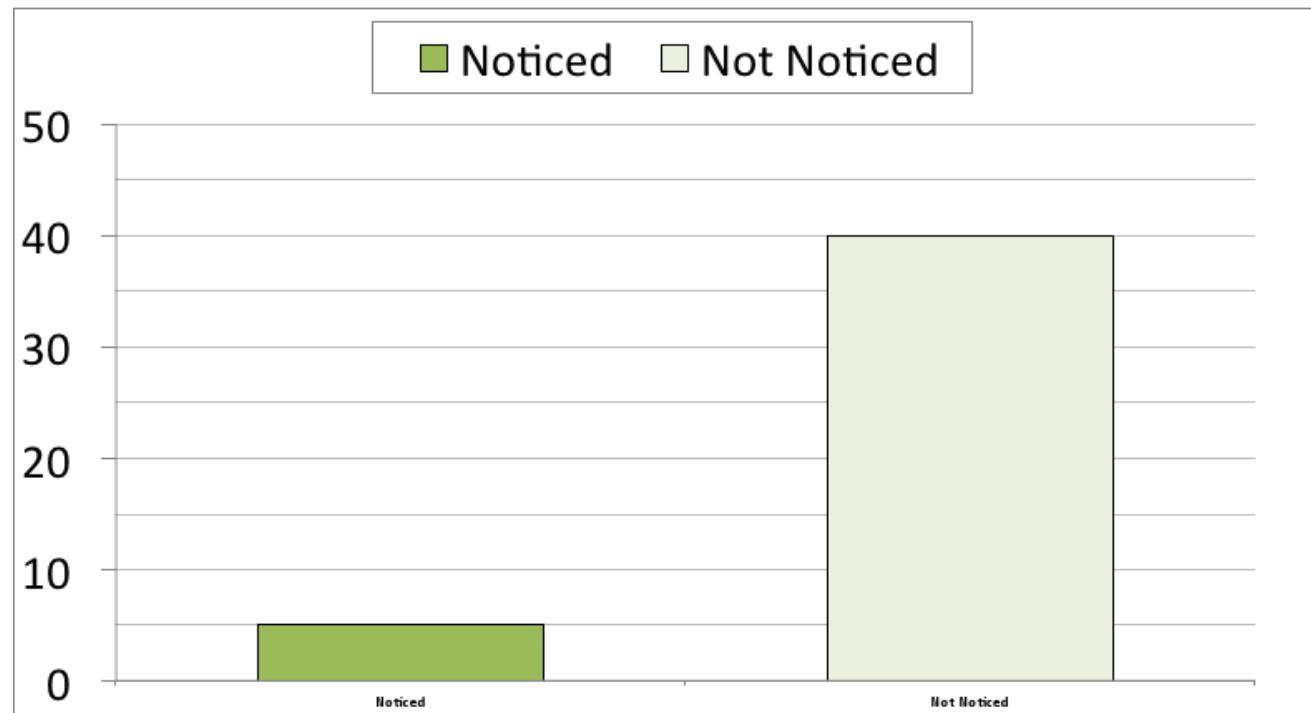
Possible Factors:

1. Contact closeness
2. Contact expertise
3. Search intent

Which matters most?

Study #1 - Results: Surprise!

Generally, subjects didn't notice the annotations!
Only **11%** were noticed!



Study #2: Design Variations

Position: 1st or 2nd

Placement

Below snippet
(default)

Above snippet

Big picture

Snippet Length

4 lines

2 lines

1 line

New Google Search experience for tablets - Official Google Mobile Blog
googlemobile.blogspot.com/2011/07/new-google-search-experience-for.html

Jul 29, 2011 – As part of our effort to evolve the Google design and experience, we've improved the [www.google.com search](#) experience on tablets. We've simplified the layout of search results pages and increased the size of page contents like text, buttons and other touch targets to make it faster and easier to browse and interact with search results ...

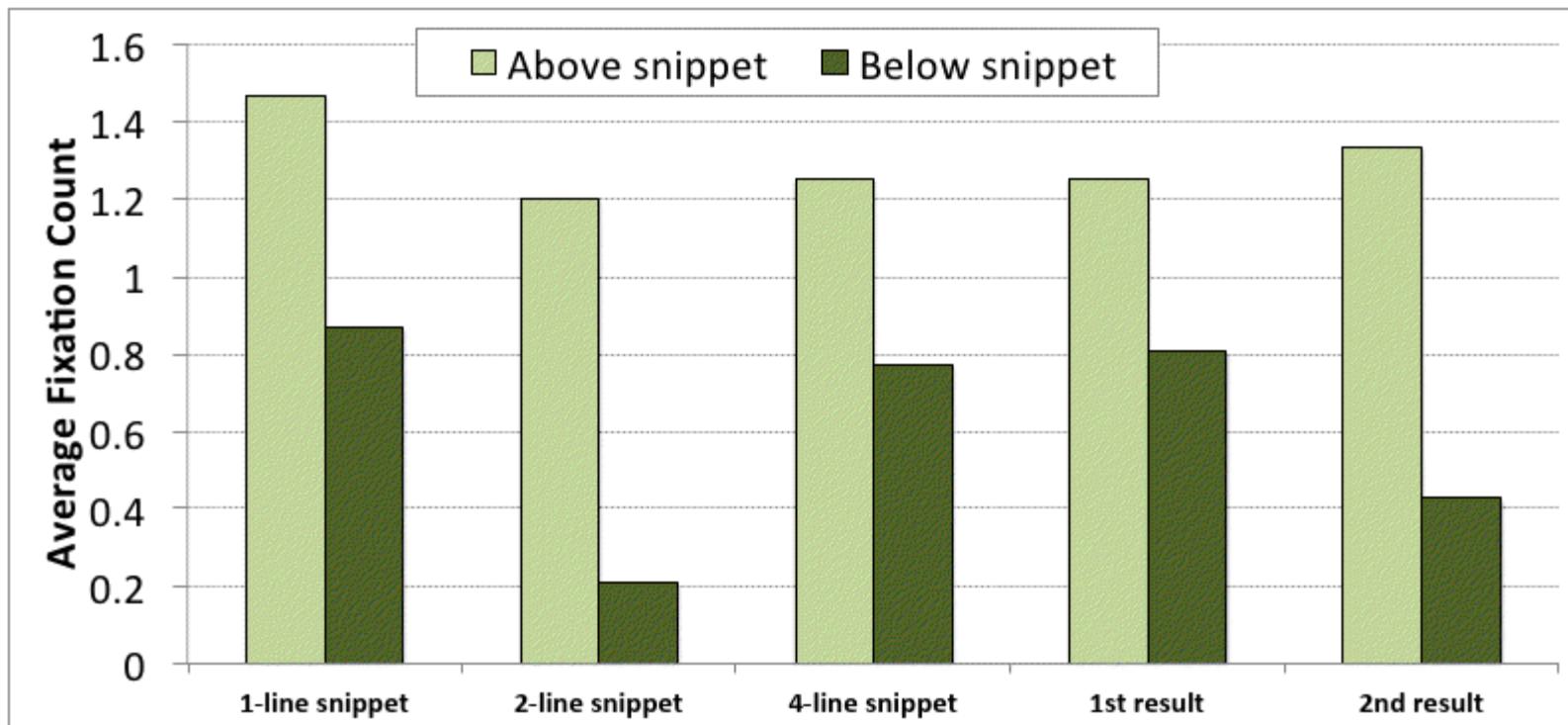
 Shared by Carolyn White

Grocery IQ Is a Brilliant Grocery List Application
lifehacker.com/5610363/grocery-iq-is-a-brilliant-grocery-list-application

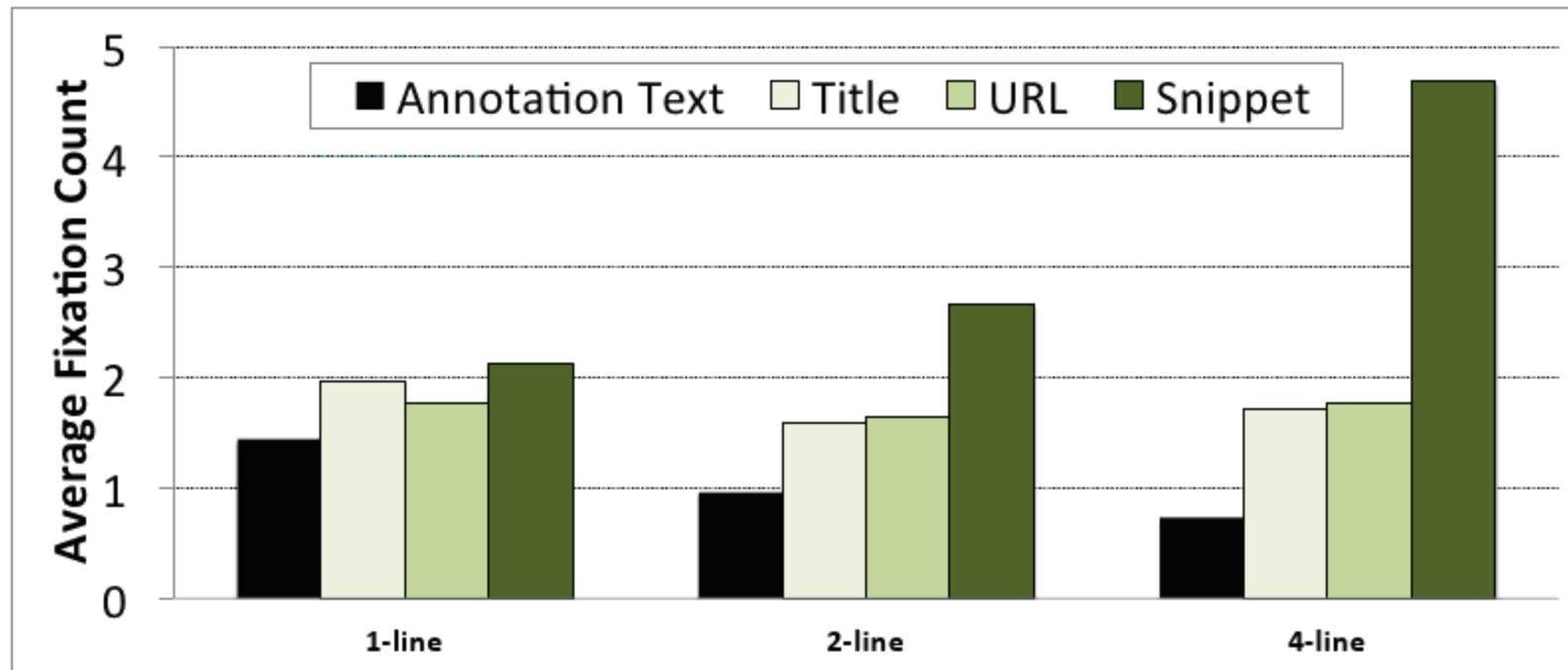
 Shared by Carmi Grushko
Aug 11, 2010 ... iOS/Android: Grocery IQ builds and manages your grocery shopping list with an ... [Grocery IQ Is a Brilliant Grocery List Application](#) ...

California Coastal and Marine Program | The Nature Conservancy
[www.nature.org/ourinitiatives/regions/northamerica/unitedstates/california/howitworks...](http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/california/howitworks/)
Feb 26, 2011 – Here in California, the Conservancy's Coastal and Marine Program is ...
Shared by Puja Jaspal

Study #2 - Results: Annotation Placement



Study #2 - Results: Snippet Length



linear regression:

2-line: ($b = -0.51$, $t(203) = -1.85$, $p < 0.07$)

4-line: ($b = -0.74$, $t(203) = -2.56$, $p < 0.01$)

Study #2 - Results: Snippet Length

Snippet Length: 1 line, 2 lines, or 4 lines

Google Announces Second Quarter 2011 Financial Results - Google ...
investor.google.com/earnings/2011/Q2_google_earnings.html
Jul 14, 2011 – In the second **quarter** of 2011, TAC totaled \$2.11 billion, or 24% of advertising ...
 Shared by Meghan Lorig

How to Keep Track of Your Cellphone Data Usage
lifehacker.com/5557836/the-best-tools-for-monitoring-your-cellphone-data-usage
Jun 8, 2010 – There are many, many **bandwidth monitoring** tools available for all three ...
Lifehacker Pack for **Android**: Our List of the Best Android Apps ...
 Shared by Tyler Hoffman

New Google Search experience for tablets - Official Google Mobile Blog
googlemobile.blogspot.com/2011/07/new-google-search-experience-for.html
Jul 29, 2011 – As part of our effort to evolve the **Google** design and experience, we've improved the **www.google.com search** experience on **tablets**. We've simplified the layout of search results pages and increased the size of page contents like text, buttons and other touch targets to make it faster and easier to browse and interact with search results ...
 Shared by John Sullivan



Annotation Perception Summary

- Subjects always pay attention to URLs and titles
- If not enough to make decision, they look to see if the snippet offers reasons to click thru
 - Annotation competes for attention in context of placement, snippet length, & avatar icons

Social Annotations in Search

Research Questions

Do some **contacts affect user choice** of search results more than others?

Are **annotations relevant** across various information needs (i.e., different queries)?

Methodology

Survey (N = 286)

Five closest contacts ("Close-Contacts")

Provide a list of who you discuss entertainment, news, computer advice ("Domain-Contacts")

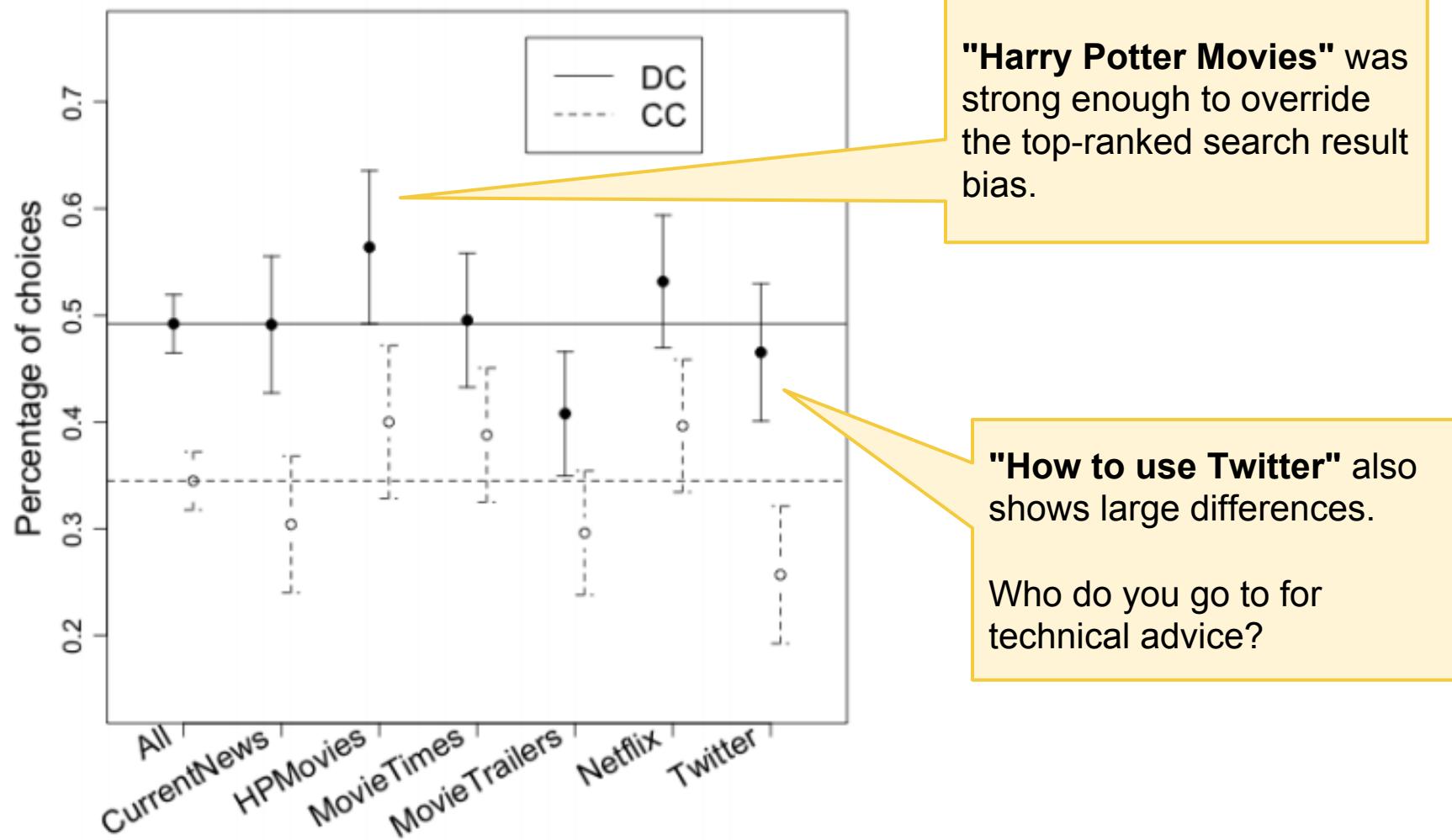
Experimental Design (N = 269)

Mock results showing mix of close and domain contacts

Lots of randomization to account for ordering effects

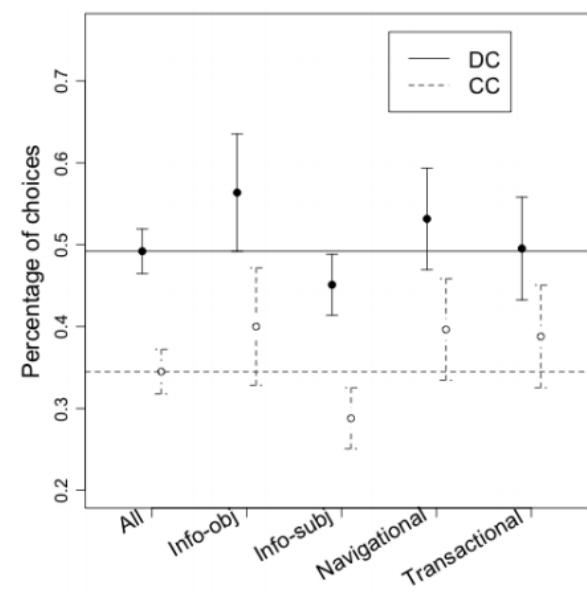
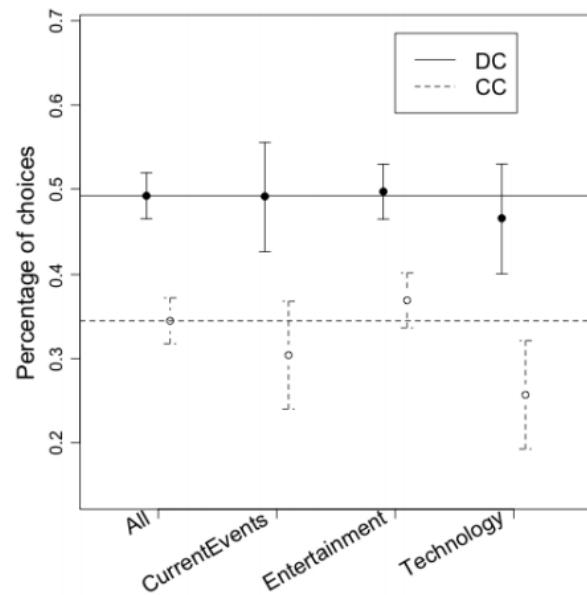
Around the Water Cooler: Shared Discussion Topics and Contact Closeness in Social Search.
Saranga Komanduri, Lujun Fang, David Huffaker, Jessica Staddon, J. (2012): In Proc. of ICWSM 2012.

We find a strong preference for domain-contact annotations on most search queries.



The preference for domain contacts holds across information needs and domains.

Query	Information Need	Domain
“current news”	Informational-subjective	Current events
“harry potter movies in order”	Informational-objective	Entertainment
“how to use twitter”	Informational-subjective	Technology
“movie times”	Transactional	Entertainment
“movie trailers”	Informational-subjective	Entertainment
“netflix”	Navigational	Entertainment





Not all ties are created equal.



What is the value of multi-method research?

Use analytics to discover general user behavior.

Understanding "why" and intent.
Triangulate evidence around a problem.

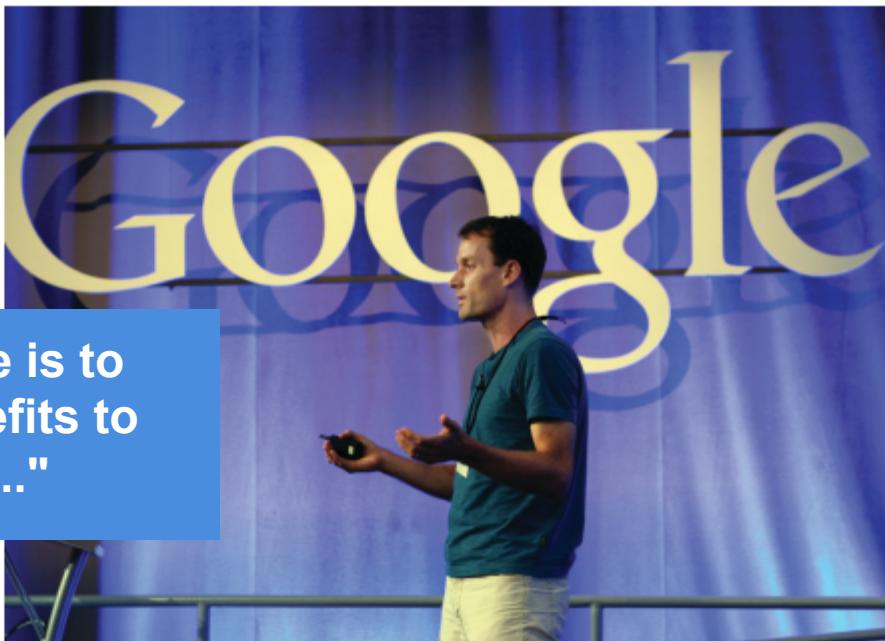
"Focus on the user and all else will follow."

Viewpoint

Google's Hybrid Approach to Research

By closely connecting research and development Google is able to conduct experiments on an unprecedented scale, often resulting in new capabilities for the company.

IN THIS VIEWPOINT, we describe how we organize computer science research at Google. We focus on how we integrate research and development and discuss the benefits and risks of our approach. The challenge in organizing R&D is great because CS is an increasingly broad and diverse field. It combines aspects of mathematical



"The goal of research at Google is to bring significant, practical benefits to our users, and to do so rapidly..."

describe their properties, because the systems now dynamically adjust to the difficult-to-predict needs of a diverse user community, and because the systems can learn from vast datasets and large numbers of interactive sessions that provide continuous feedback.

We have also noted that CS is an expanding sphere where the core of the

commercial systems that set new standards upon which others then build are in product needs. Recent articles, such as those by Leifer et al.⁸ and Enkel et al.⁶

DOI:10.1145/2209249.2209262

Viewpoint Google's Hybrid Approach to

By closely connecting research and development, Google's hybrid approach to conducting experiments on an unprecedented scale has led to new capabilities for the company.

IN THIS VIEWPOINT, we describe how we organize computer science research at Google. We focus on how we integrate research and development and discuss the benefits and risks of our approach. The challenge in organizing R&D is great because CS is an increasingly broad and diverse field. It combines aspects of mathematical reasoning, engineering methodology, and the empirical approaches of the scientific method. The empirical components are clearly on the upswing, in part because the computer systems we construct have become so large that analytic techniques cannot properly describe their properties, because the systems now dynamically adjust to the difficult-to-predict needs of a diverse user community, and because the systems can learn from vast datasets and large numbers of interactive sessions that provide continuous feedback.

We have also noted that CS is an expanding sphere, where the core of the

Blurry lines between research and development.

Researchers embedded on product teams; work closely with engineers and designers.

Iterative and usually involves writing near-production code from day one.

Leverage cloud infrastructure to deploy experiments to mass user base, or rapidly deploy a prototype at scale.