Good Abandonment in Mobile and PC Internet Search

Introduction to Information Retrieval
CS 221

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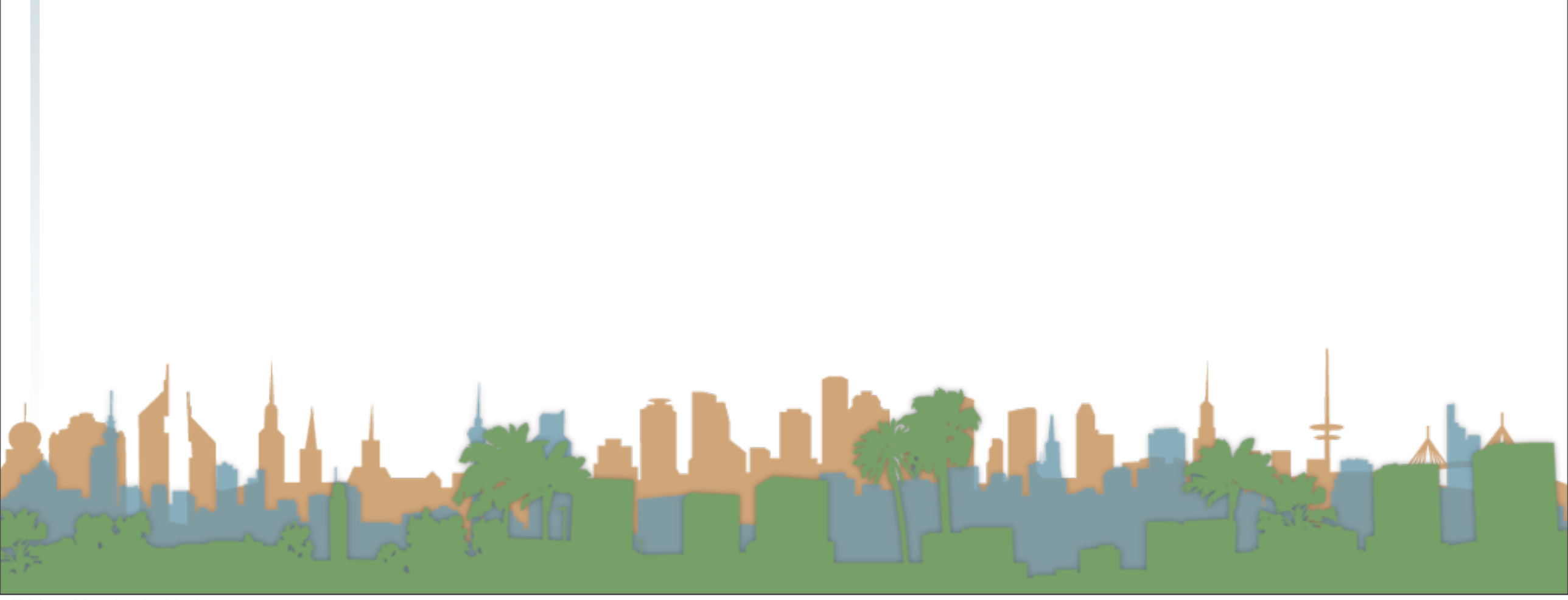
Link Analysis for Private Weighted Graphs



Link Analysis for Private Weighted Graphs

Good Abandonment in Mobile and PC Internet Search

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ABSTRACT

Query abandonment by search engine users is generally considered to be a negative signal. In this paper, we explore the concept of *good abandonment*. We define a good abandonment as an abandoned query for which the user's information need was successfully addressed by the search results page, with no need to click on a result or refine the query. We present an analysis of abandoned internet search queries across two modalities (PC and mobile) in three locales. The goal is to approximate the prevalence of good abandonment, and to identify types of information needs that may lead to good abandonment, across different locales and modalities. Our study has three key findings: First, queries potentially indicating good abandonment make up a significant portion of all abandoned queries. Second, the good abandonment rate from mobile search is significantly higher than that from PC search, across all locales tested. Third, classified by type of information need, the major classes of good abandonment vary dramatically by both locale and modality. Our findings imply that it is a mistake to uniformly consider query abandonment as a negative signal. Further, there is a potential opportunity for search engines to drive additional good abandonment, especially for mobile search users, by improving search features and result snippets.

Categories and Subject Descriptors

H.3.3 [**Information Storage and Retrieval**]: Information Search and Retrieval

General Terms

Measurement, Human Factors

Keywords

good abandonment, mobile internet search, PC internet search, query analysis

1. INTRODUCTION

The information retrieval community has a long tradition of using user clicks on search results as a positive signal. Clicks (and sometimes a lack of clicks as well) have been used successfully to learn ranking functions [14, 13, 3, 18] and to evaluate comparative algorithms in A-B [9, 5] or interleaved experiments [8, 10]. It has been considered to be an indicator of user dissatisfaction if users choose not to click on any results, or worse, "abandon" their query by neither clicking a result nor issuing a query refinement [10].

Internet search engines have added features over the past several years that attempt to answer users' information needs directly on the search results page, without requiring a click on any of the results. Leading engines now provide a large array of these features for basic information needs such as weather, stock quotes, local business addresses and phone numbers, images, current news headlines, flight information, package delivery tracking, and many others [1, 2]. In addition, the result snippets returned by search engines have improved over time [19, 17] and may often answer information needs directly [7].

In this paper, we explore the concept of *good abandonment*. We define a good abandonment as an abandoned query for which the user's information need was successfully addressed by the search results page, with no need to click on a result or refine the query.

We present an analysis of abandoned queries sampled from Google's search logs. Specifically, we analyze abandoned queries from three countries (the United States, Japan and China) across two modalities (PC search and mobile search) for a total of six query streams.

We are particularly interested in mobile search and how it compares to PC (desktop/laptop) search with respect to abandonment. We anticipate that there may be differences for several reasons. First, on mobile devices—even current top-tier devices such as the Apple iPhone—opening web pages is often slow and clunky, with formatting issues, usability issues, and content omissions. Therefore we postulate that users might want to avoid opening pages, and instead formulate queries in a way that may return answers directly within search results. Second, anecdotally we hear from users about a "quick answer in a bar" type of use case for mobile search. Here, users are out with friends (and away from their PC), and use mobile search to answer questions that come up in conversation—what's the weather going to be like tomorrow, what time does the movie start tonight, what year was this celebrity born, etc. [16, 12]. This use case, if real, would potentially drive good abandonment on

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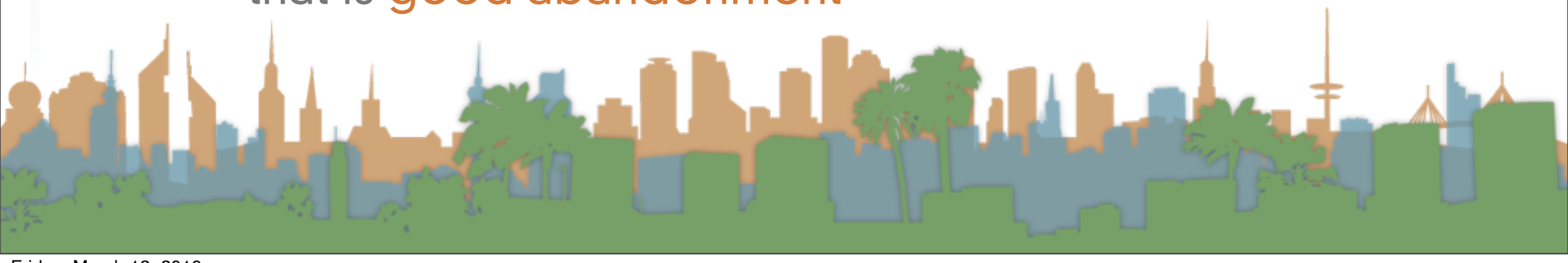
- Information Retrieval uses some basic signals as quality indicators:
  - Clicks: indicate good results
  - Non-click: indicate bad results
  - No click: indicate bad results

- This paper challenges the "no click" is bad assumption
  - No click: is called "abandonment"
  - If a user gets the answer they want in a snippet...
    - that is good abandonment



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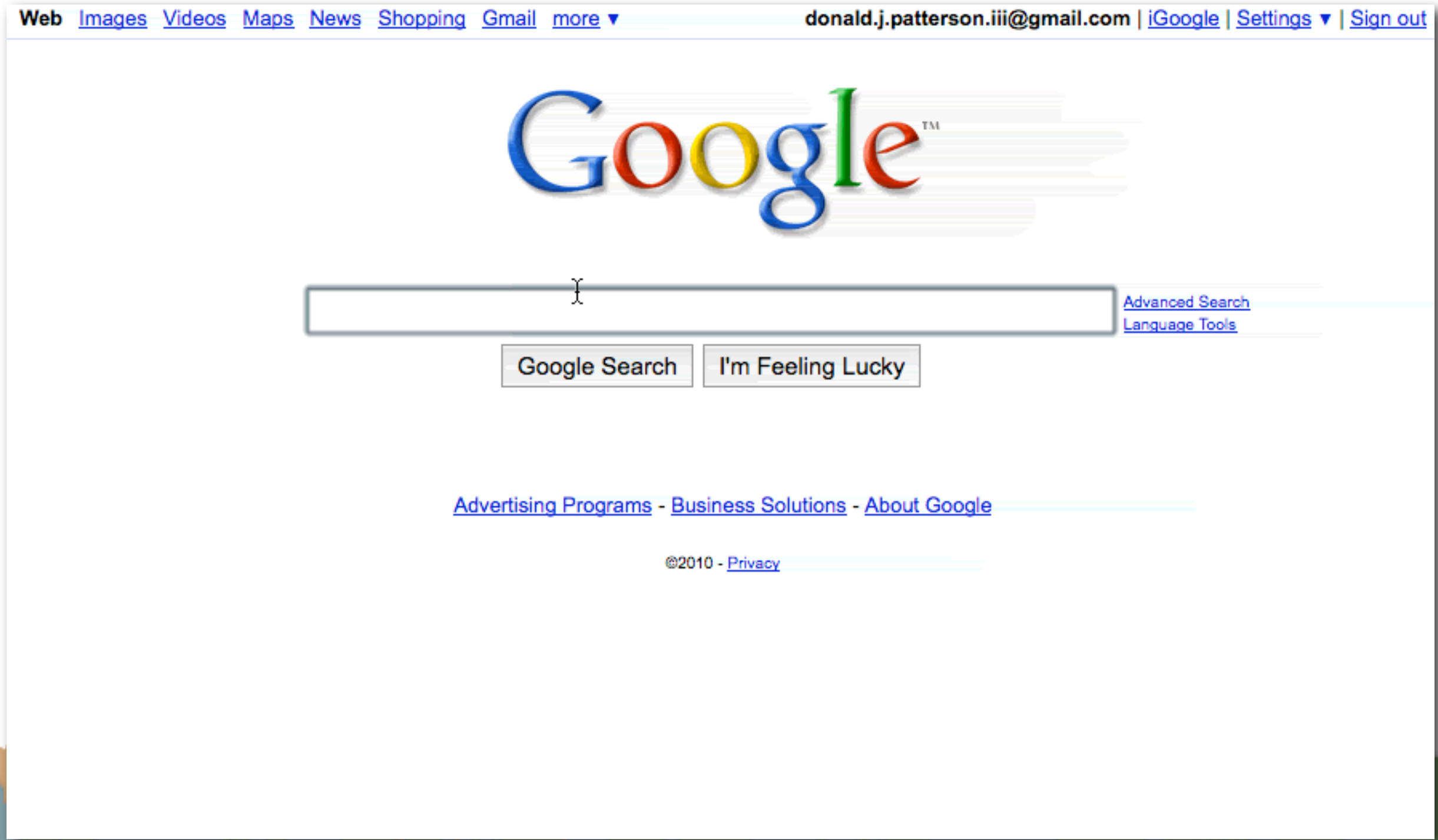
- Examples:



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- Methodology:
  - Google Researchers
  - Collected 6 types of abandoned queries from:
    - China, Japan, and the U.S.
    - on PC and on mobile
  - Abandoned query is:
    - a query without a click or any further query for 24 hours
  - Removed personal queries and malformed queries

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- Methodology:
  - Sample size of abandoned queries

	PC	Mobile
China	1000	1000
Japan	400	400
U.S.	400	400

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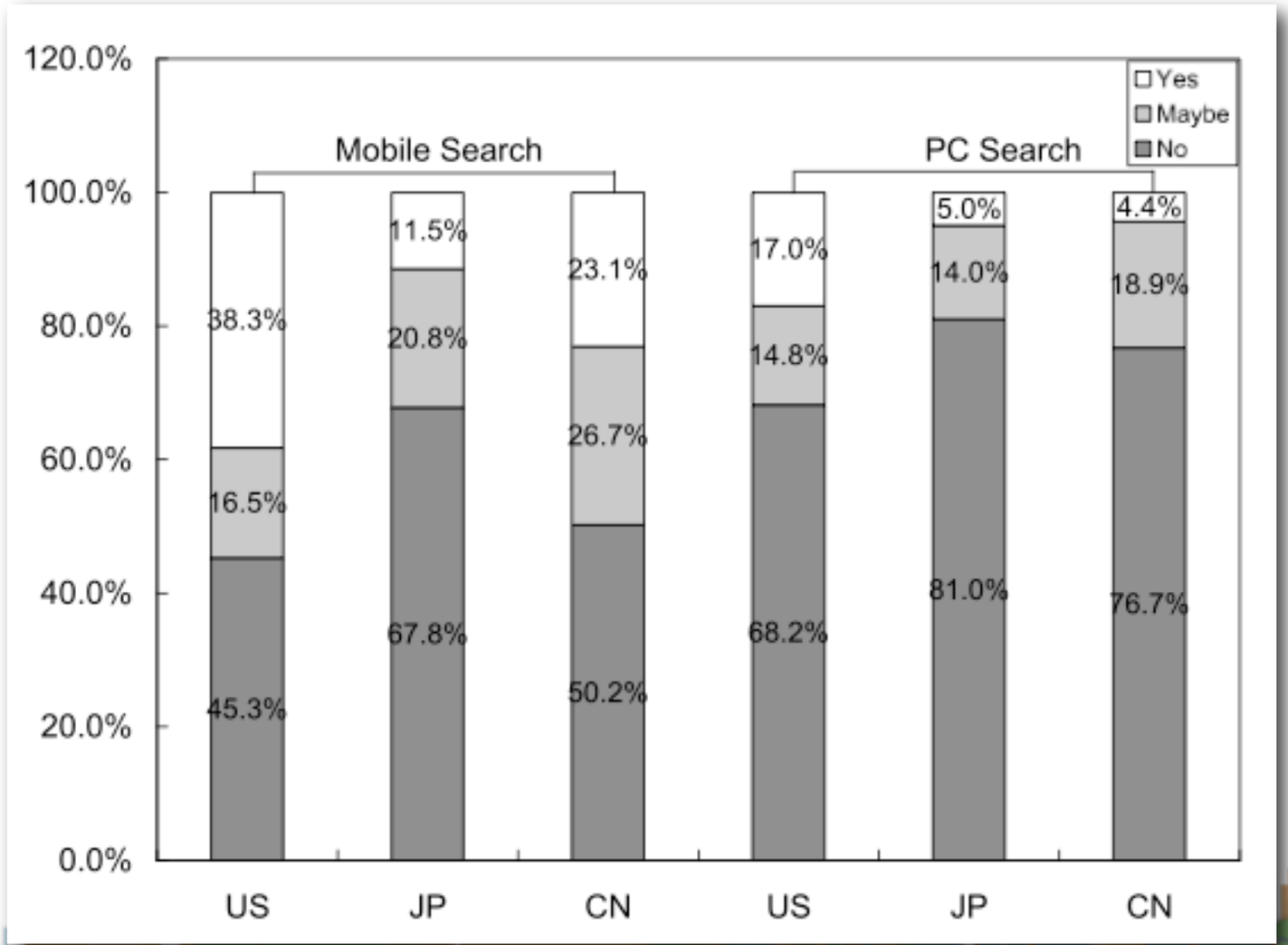
- Methodology:
  - Evaluated samples by hand for upper bound
    - Could this query have been answered automatically?



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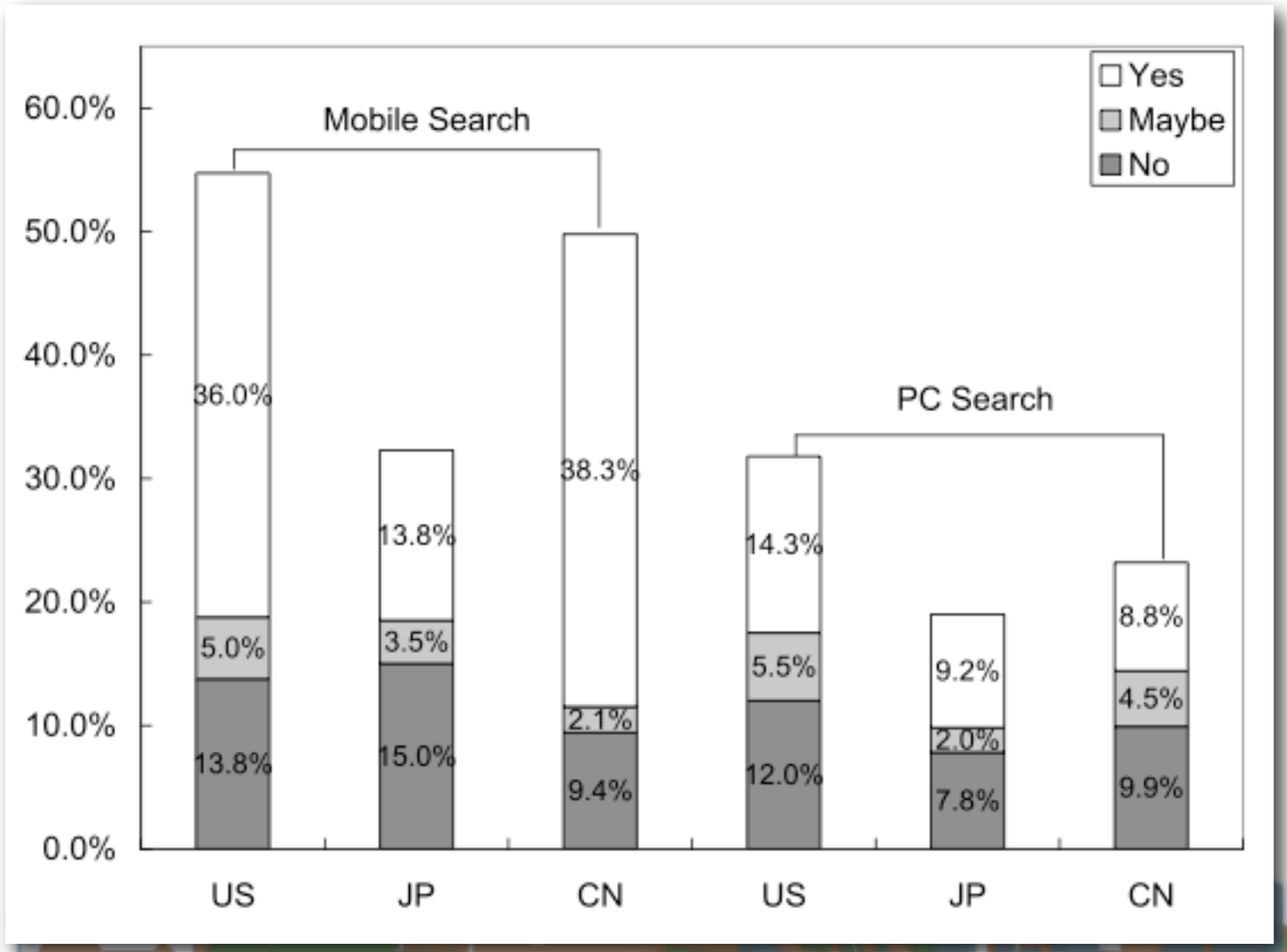
- Methodology:
  - Evaluated samples by hand for Google results
    - Did this query get answered automatically?



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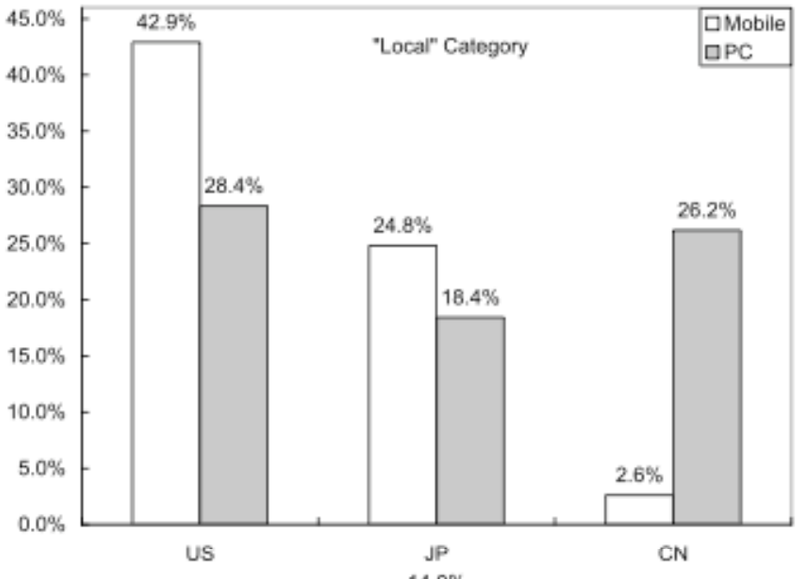
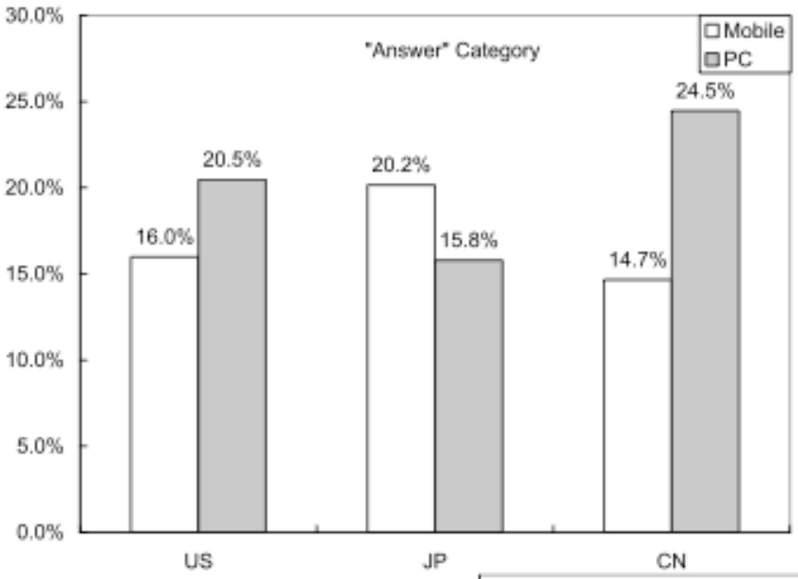
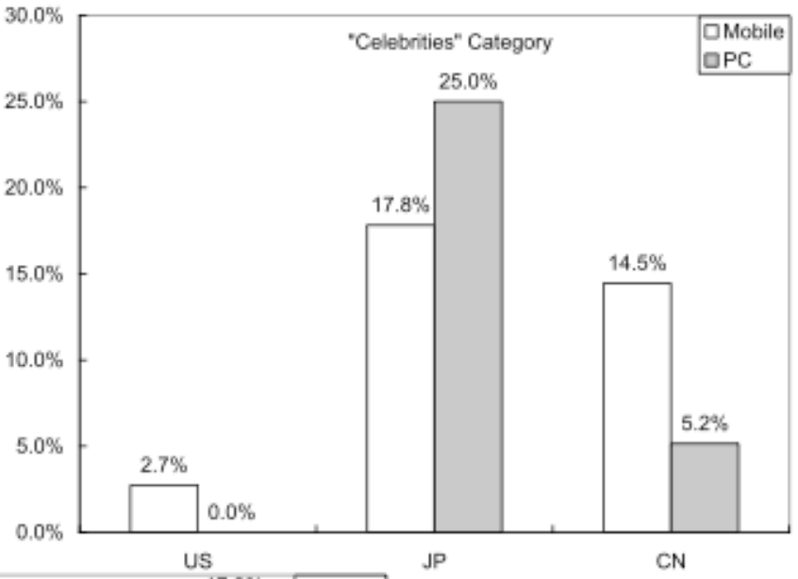
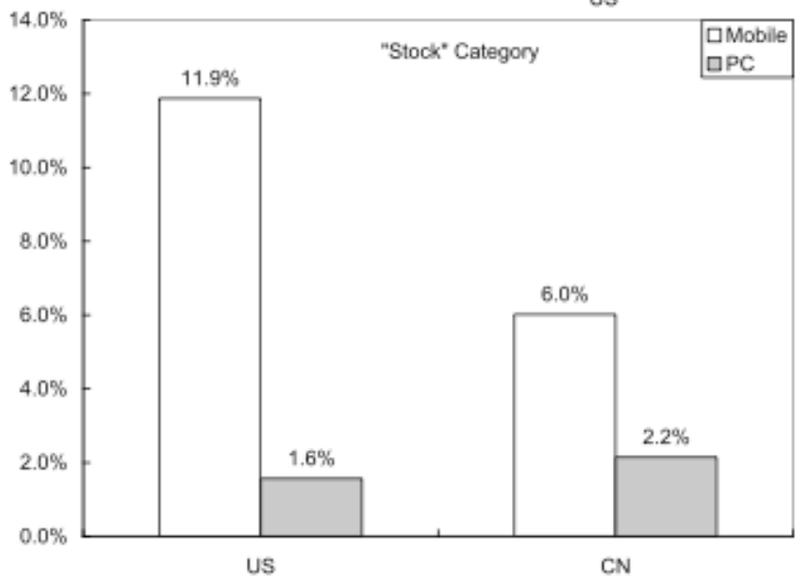
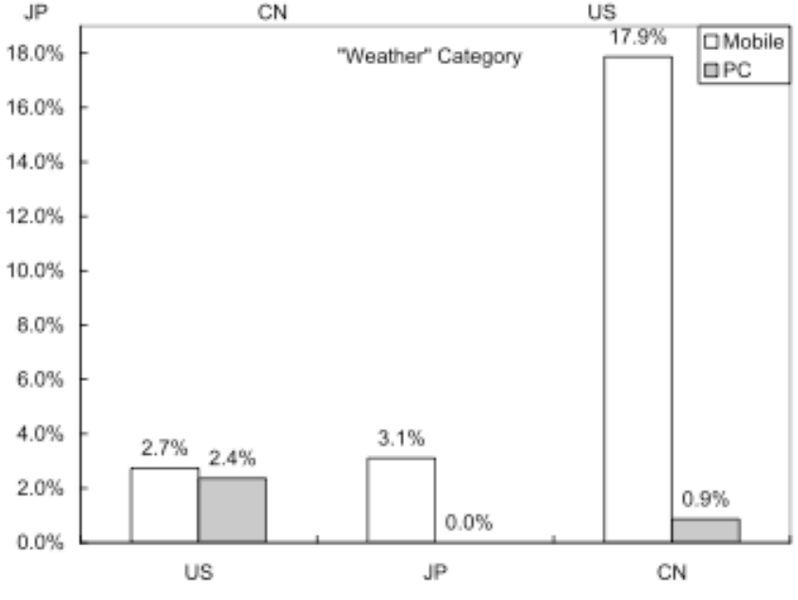
- Methodology:
  - Categories of abandoned search











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- Methodology:
  - Queries that could be answered that weren't by category

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