



# **When no clicks are good news**

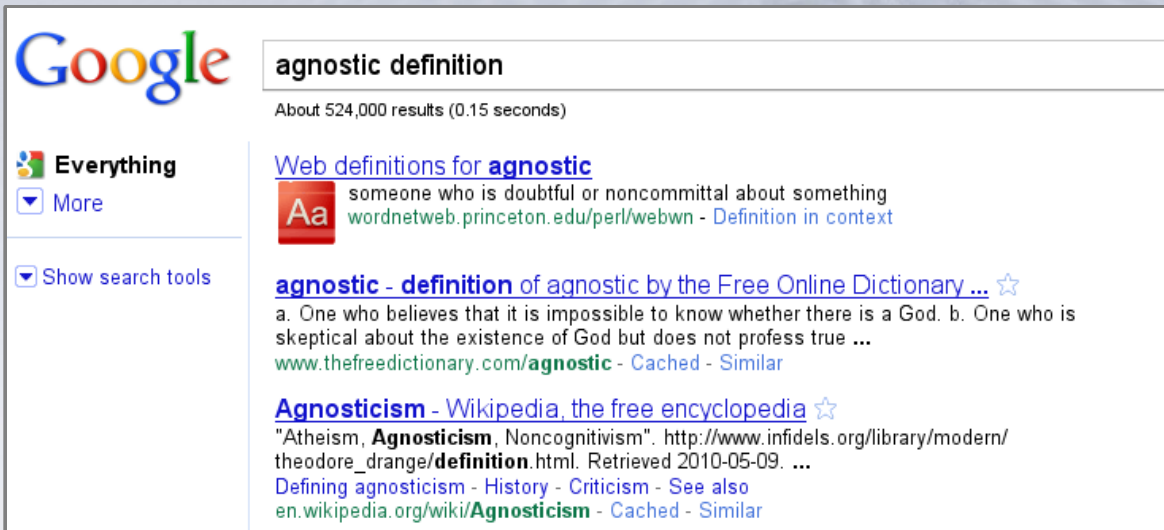
Carlos Castillo, Aris Gionis, Ronny Lempel, Yoelle Maarek

Yahoo! Research Barcelona & Haifa

# Usage mining for search

- **Behavioral signals are useful** to measure performance of retrieval systems
- Relevant results are
  - **clicked** more often,
  - visited for **longer time**,
  - lead to long-term **engagement**,
  - etc.
- However, predicting user satisfaction accurately from search behavior signals is still an **open problem**

# A (not-so-)special case



Google

agnostic definition

About 524,000 results (0.15 seconds)

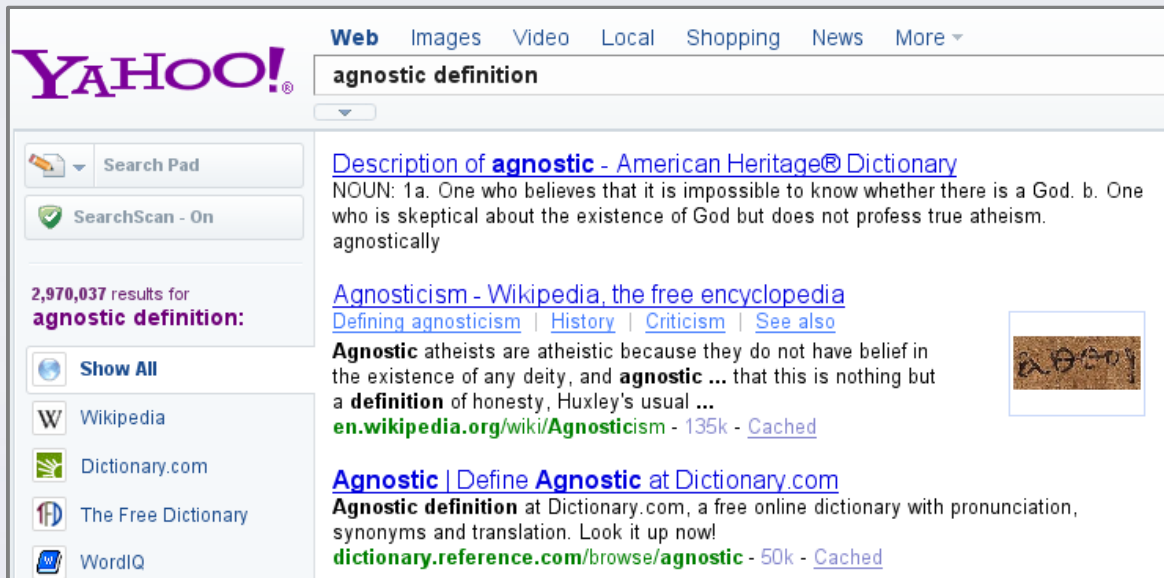
Everything  
More

Show search tools

[Web definitions for agnostic](#)  
**Aa** someone who is doubtful or noncommittal about something  
[wordnetweb.princeton.edu/perl/webwn](http://wordnetweb.princeton.edu/perl/webwn) - Definition in context

[agnostic - definition of agnostic by the Free Online Dictionary ...](#) ☆  
a. One who believes that it is impossible to know whether there is a God. b. One who is skeptical about the existence of God but does not profess true ...  
[www.thefreedictionary.com/agnostic](http://www.thefreedictionary.com/agnostic) - Cached - Similar

[Agnosticism - Wikipedia, the free encyclopedia](#) ☆  
"Atheism, **Agnosticism**, Noncognitivism". [http://www.infidels.org/library/modern/theodore\\_drango/definition.html](http://www.infidels.org/library/modern/theodore_drango/definition.html). Retrieved 2010-05-09. ...  
[Defining agnosticism - History - Criticism - See also](#)  
[en.wikipedia.org/wiki/Agnosticism](http://en.wikipedia.org/wiki/Agnosticism) - Cached - Similar



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agnostic definition

Search Pad

SearchScan - On

2,970,037 results for **agnostic definition**:

Show All

Wikipedia

Dictionary.com

The Free Dictionary

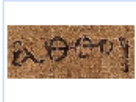
WordIQ

[Description of agnostic - American Heritage® Dictionary](#)  
NOUN: 1a. One who believes that it is impossible to know whether there is a God. b. One who is skeptical about the existence of God but does not profess true atheism. agnostically

[Agnosticism - Wikipedia, the free encyclopedia](#)  
[Defining agnosticism](#) | [History](#) | [Criticism](#) | [See also](#)

**Agnostic** atheists are atheistic because they do not have belief in the existence of any deity, and **agnostic ...** that this is nothing but a **definition** of honesty, Huxley's usual ...  
[en.wikipedia.org/wiki/Agnosticism](http://en.wikipedia.org/wiki/Agnosticism) - 135k - Cached

[Agnostic | Define Agnostic at Dictionary.com](#)  
**Agnostic definition** at Dictionary.com, a free online dictionary with pronunciation, synonyms and translation. Look it up now!  
[dictionary.reference.com/browse/agnostic](http://dictionary.reference.com/browse/agnostic) - 50k - Cached



If we satisfy the user  
by impression, then  
we observe a **lower**  
click-through rate

# Satisfaction by impression


## Oneboxes and Direct Displays

### Oneboxes<sup>1</sup> and Direct Displays<sup>2</sup> (DD) are


- **Very specific results** answering (mostly) unambiguous queries with a unique answer directly on the SERP
- **Displayed above regular Web results**, due to their high relevance, and in a slightly different format.
- Typical example: `weather <city name>`
  - Test: guess which onebox/DD was served by which search engine:-)

**Weather for Geneva, Switzerland -**

**34°C | °F**  
Current: **Cloudy**  
Wind: SW at 13 km/h  
Humidity: 30%

Mon	Tue	Wed	Thu
			
33°C   17°C	31°C   20°C	33°C   8°C	30°C   11°C

### Extended **weather** forecast for **Geneva, Switzerland** ([Change Location](#))

 Currently: 93°F Partly Cloudy 89°F   65°F	 Tomorrow Mostly Cloudy 87°F   68°F	 Wednesday Sunny 91°F   66°F
--	--	---

[Switzerland Weather](#) · [localweatherforecasts.net](#)  
Local Switzerland **Weather** Forecast -- Your #1 Online **Weather** Source

[Weather in Geneva, Switzerland](#)

**93°F · (°C)**  
Wind: 8 mph WSW  
Humidity: 30%

<b>Foreca</b>	Today 90° / 65°	Tue 90° / 68°	Wed 95° / 63°	Thu 86° / 65°	Fri 93° / 68°
<b>Intellicast</b>	86° / 64°	86° / 68°	90° / 64°	82° / 63°	82° / 63°

[Compare 10 Day Forecast](#) · [Hourly Forecast](#) · [Weather Maps](#)

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<sup>1</sup> : **Google terminology**  
<sup>2</sup> : **Yahoo! terminology**

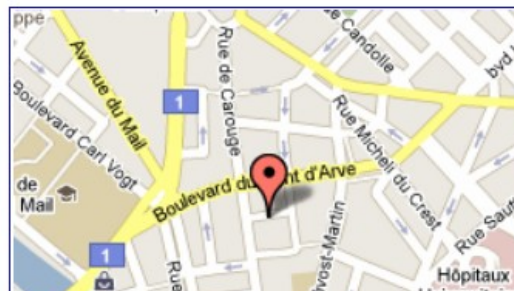


# Increasing number of "by impression" results

- When searching for specific stocks, movie or train schedules, sports results, package tracking (Fedex/UPS), etc.
- To the extreme, what about spell checking, arithmetic operations or currency conversion, addresses, things to do?

## GOOG - Google Inc.

**476.00 +8.51 (1.82%)** at 07:24 PDT Jul 12  
 Open: 472.38 High: 479.44 Low: 471.08  
 Quote delay: 15 min - Nasdaq, 20 min - NYSE and Amex  
[News](#) | [Charts](#) | [Quotes](#) | [Message Boards](#)  
[Smackdown 2: They're back ... and ready to ...](#) - at MarketWatch  
[finance.yahoo.com](#)



## Au Coq-en-Pâte

[Place page](#)

passage de Saint-François 4  
 1205 Genève, Schweiz  
 022 328 09 00  
 Bus: Genève, Contamines  
[Get directions](#)  
[Write a review](#)



## Geneva, Switzerland - Visit

[travel.yahoo.com](#)  
[Hotels](#) | [Restaurant Guide](#) | [Events](#)

- Top Rated Things To Do (53)
- 1 [Jet d'Eau \(Water Fountain\)](#)
  - 2 [Promenade des Bastions](#)
  - 3 [Horloge Fleurie \(Flower Clock\)](#)

## Group A - 2010 World Cup Coverage

[sports.yahoo.com](#)  
[Scores](#) | [Teams](#) | [News](#) | [Photos](#) | [Videos](#)

Group A Teams	GP	W	T	L	GF	GA	+/-	Pts
France	0	0	0	0	0	0	0	0
Mexico	0	0	0	0	0	0	0	0
Uruguay	0	0	0	0	0	0	0	0
South Africa	0	0	0	0	0	0	0	0

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apple  GET QUOTES Finance

AAPL	Apple Inc.
APC.F	APPLE
APC.DE	APPLE
APC.SG	APPLE
ANY	14% SPARQS Linked to Apple Inc.
APC.MU	APPLE
APC.HM	APPLE
APC.DU	APPLE
APC.BE	APPLE
NAIZX	NICHOLAS APPLEGATE INTERNATIONAL

[Show all results for apple](#)

Tip: Use comma (,) to separate multiple quotes. [Learn more...](#)

## 2010 FIFA World Cup™: Final - Add to iGoogle

Netherlands **0:1** Spain - Highlights

Winners:  
 1st place Spain - Overview  
 2nd place Netherlands - Overview  
 3rd place Germany - Overview

[FIFA.com - Awards - Highlights - Statistics - Brazil 2014](#)

# The problem

- Click-based metrics for user satisfaction
- For cases where we expect no clicks
  
- Not only search sessions
  - Any browsing/interaction session

# Our proposal

- General method
  - Pick a class of users with a distinctive behavior
  - Study their response to changes

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- General method
  - Pick a class of users with a distinctive behavior
  - Study their response to changes
- Specific method
  - Find users who are “Tenacious”
    - reformulate or click, do not let go
  - Measure their abandonment



# How to model users?

- Session representation
  - Actions classes: queries and clicks
    - XQCQX means “start, query, click, query, stop”
  - Alternative: reformulation classes
- User representation
  - Frequency of action 3-grams = 15 features in total
  - *Tenacity* =  $(XQQ+XQC)/(XQQ+XQC+XQX)$

# (Preliminary) experiments

- Segment sessions into logical “goals”
- Divide goals in two groups
  - With direct-displays above position 5 (DD)
  - Without (NO-DD)
- Metric
  - Find users with  $Tenacity_{NO-DD} \geq 80\%$
  - Measure  $Tenacity_{DD} / Tenacity_{NO-DD}$
- Ground truth
  - Ask humans “do you think users querying Q will be satisfied by impression by this DD?”
    - 1=never ... 5=always

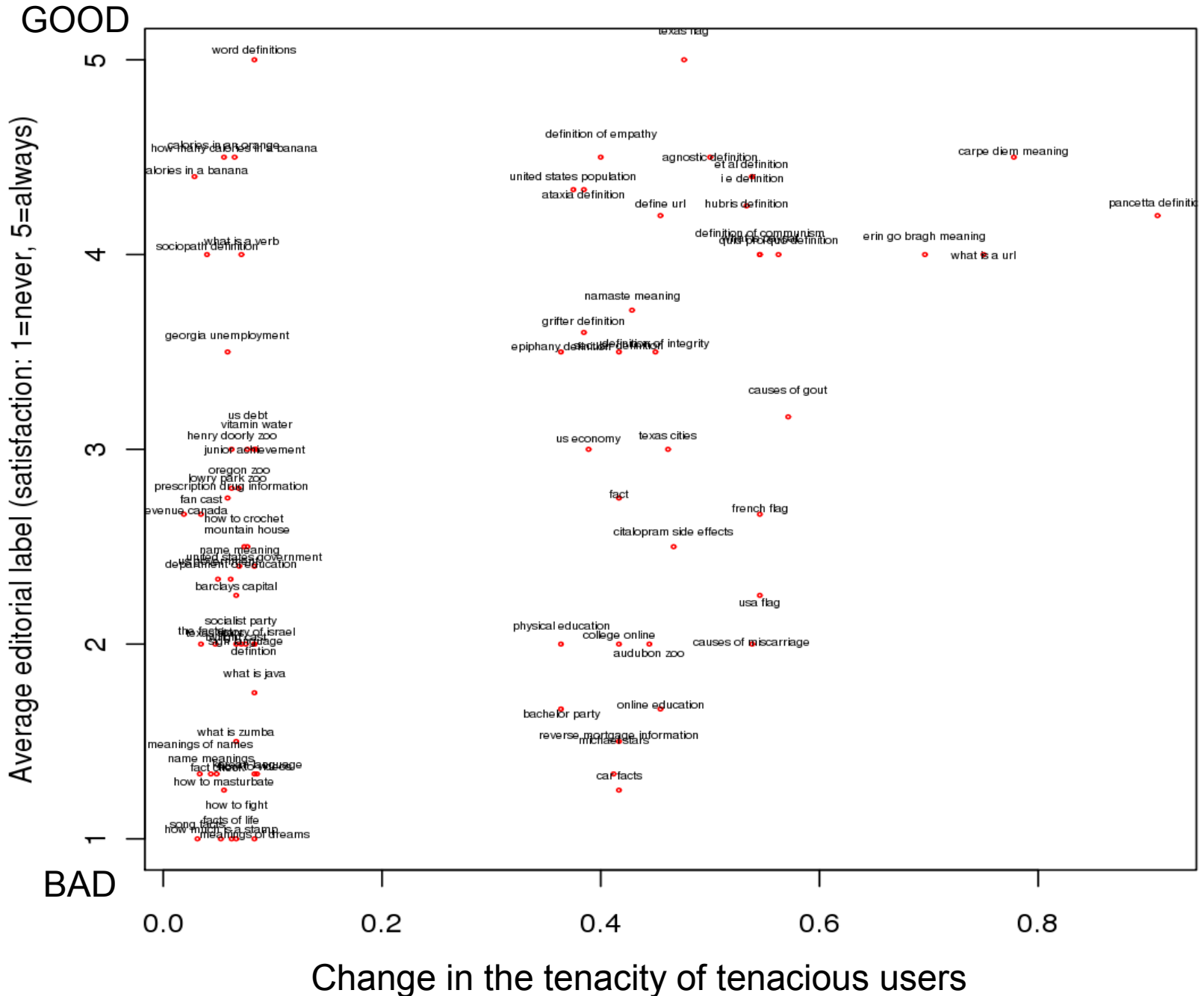




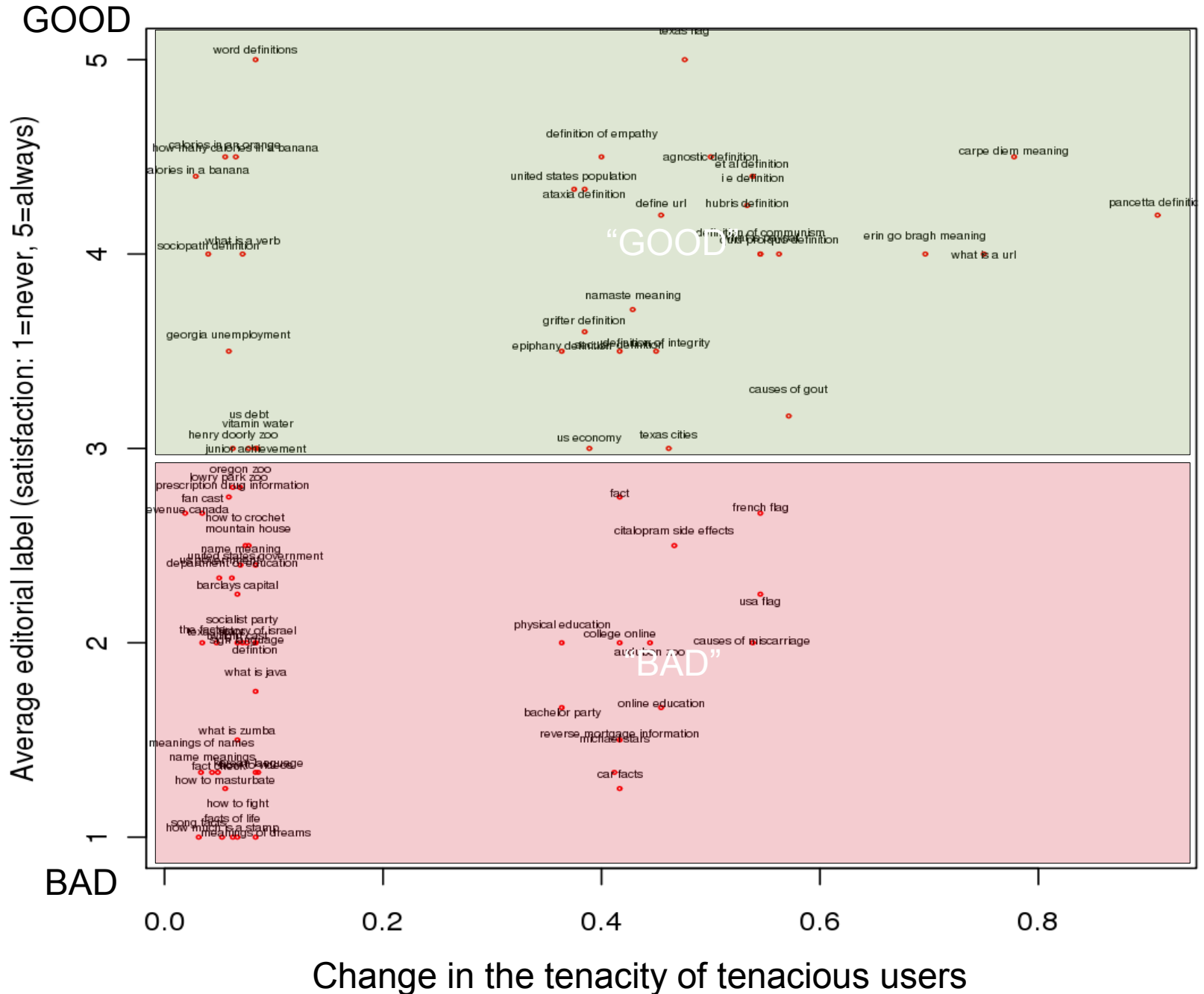




# Pitbull: editorial vs metric (type "reference")



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# Summary

- Tenacious users can be used to identify bad DDs
- General method: usage mining on classes of users
  - Shoppers
  - Smart searchers
  - Click-a-lots / explorers
  - Leaders
  - Poodles?
  - etc.
- General/shared taxonomy of users?



**Thank you!**

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