

Google the Gatekeeper: How Search Components Affect Clicks and Attention

Jeffrey Gleason, Desheng Hu, Ronald E. Robertson, Christo Wilson
Northeastern University



Background: Evolution of Google Search

1998: 10 Blue Links

Advanced Search Preferences Language Tools Search Tips

Google
ferrari (Google Search)

Web Images Groups Directory News

Searched the web for **ferrari**

Ferrari - Find Cars, Trucks, Auto Parts & More
www.eBay.com - eBay Motors - Buy or Sell All Types of Vehicles
Category: Recreation > Autos > Makes and Models > Ferrari

Ferrari
Description: The official site for the US and Canada. Dealer listings, extensive detail on current and past models.
Category: Recreation > Autos > Makes and Models > Ferrari
www.ferrari.com - 1k - Cached - Similar pages

www.shellmotorsport.com / ferrari - home
Welcome to the www.shellmotorsport.com / ferrari website. News, results, downloads, screensavers, photographs, postcards, car & ...
www.shell-ferrari.com - 5k - Cached - Similar pages

Welcome to Ferrari UK
The official importer and distributor of Ferrari cars in the UK. Online sales of Official Ferrari merchandise, clothing and model cars. ...
Description: Motorsport news, events calendar, and general information. [Requires Flash]
Category: Recreation > Autos > Makes and Models > Ferrari
www.ferrari-uk.com - 3k - Nov 2, 2002 - Cached - Similar pages

Ferrari World
News, Archive, The Team, F1 cars, Grands Prix, Ferrari Challenge, Historic Challenge, Yesterday, Today, You & Ferrari, Ferrari Owners' ...
www.ferrari.it/cgi-bin/world.dll/ferrariworld/scripts/home/home.jsp?B_UseBVCookie=no&language=ENGLISH -

Ferrari-Carano Sonoma Wineries: Sonoma wine tour, Sonoma wine ...
Ferrari-Carano Vineyards and Winery, a premiere wine country estate in Sonoma County offers a wonderful collection of California wines, rich in varietal flavor. ...
Description: Healdsburg producer of a range of red and white wines. Includes information about the wines, wine.
Category: Recreation > Food > -> California > North Coast > Sonoma Valley
www.ferrari-carano.com - 14k - Cached - Similar pages

Ferrari Club Of America
Description: The Club's home site, with membership information, collections of technical tips, regalia for sale. ...
Category: Recreation > Autos > Makes and Models > Ferrari > Clubs
www.ferrariclubofamerica.org - 2k - Cached - Similar pages

Welcome to Ferrari North America | FerrariUSA.com
Best viewed with Internet Explorer 5.01 or higher / Netscape 6.2 or higher.
www.ferrariusa.com - 2k - Cached - Similar pages

Ferrari Market Letter
The Ferrari Market Letter is the world's largest collection of Ferrari classified ads in existence. Published bi-monthly it includes ...
Description: Biweekly magazine, appearing both in print and online, containing ads for Ferraris from all over the U
Category: Recreation > Autos > -> Ferrari > Magazines and E-zines
www.ferrarimarketletter.com - 28k - Nov 2, 2002 - Cached - Similar pages

Ferrari
www.ferrariworld.com - 1k - Cached - Similar pages

Ferrari Owners' Club
" welcome to the Ferrari Owners' Club of Great Britain.
Click here to enter Ferrari Owners' Club Logo.
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Ferrari World
News, Archive, The Team, F1 cars, Grand Prix, Ferrari Challenge, Historic Challenge, Yesterday, Today, You & Ferrari, Ferrari Owners' ...
www.ferrari.it/cgi-bin/world.dll/ferrariworld/scripts/home/home.jsp?BV_UseBVCookie=no&language=ENGLISH -

Ferrari-Carano Sonoma Wineries-Sonoma wine tour- Sonoma wine ...
Ferrari-Carano Vineyards and Winery, a premiere wine country estate in Sonoma County offers a wonderful collection of California wines, rich in varietal flavor. ...
Description: Headburg producer of a range of red and white wines. Includes information about the wines, winery.
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ferrari
www.ferrariworld.com - 1k - Cached - Similar pages

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ferrariownersclub.co.uk - 3k - Cached - Similar pages

2007: Universal Search

Web Images Maps News Videos Local More

Google

Web News Maps Blogs

Bank of America
Get Free Checking, Online Banking, And More. Open Today. Official Site

Bank of America | Home | Federal
Welcome to Bank of America, the nation's leading financial institution and home for all of our personal financial needs.
www.bankofamerica.com/ - 10k - Cached - Similar pages

Locations
Atlanta Charlotte Chicago Dallas Denver Houston Los Angeles Miami Minneapolis New York City Philadelphia San Francisco San Jose Washington, DC
More results from bankofamerica.com >

Bank of America Online Banking, Online Banking Overview from Bank ...
Discover why more than 20 million people choose Bank of America Online Banking. With Online Banking you can manage your accounts, pay your bills, and more.
www.bankofamerica.com/onlinebanking/ - 47k - Cached - Similar pages

People's United Bank - Everything Starts With You
People's United Bank provides consumer, commercial, financial, small investment, wealth management and trust services to personal and small business. ...
www.peoples.com - 20k - Cached - Similar pages

News results for bank
Bank of America CEO credits best bank photo before - 1 hour ago
NEW YORK (AP) -- A member of bank stocks bucked the broader market Monday, pulling higher as investors pined for news on which banks will report ...
The Associated Press - 2 - Cached - Similar pages
BC news: Best bank for sale since 1993 | The Business Journal of the ...
CBS news 2.5 ed. Investors focus on bank safety - Reuters - 177 related articles >

Local business results for bank near San Francisco, CA - Change location

A Bank of America - www.bankofamerica.com - (415) 953-2511 - 1,000ft
B Wells Fargo Bank - www.wellsfargo.com - (415) 274-9900 - 2,000ft
C US Bank Bank for - www.usbank.com - (415) 763-6887 - 2,000ft
D Bank of America - www.bankofamerica.com - (415) 432-4324 - 100ft
E Wells Fargo Bank for - www.wellsfargo.com - (800) 844-3857 - 2,000ft
F Bank of America - www.bankofamerica.com - (415) 432-2374 - 1,000ft
G Wells Fargo Bank - www.wellsfargo.com - (800) 766-7099 - 2,000ft
H Bank of America - www.bankofamerica.com - (415) 441-1512 - 100ft
www.bankofamerica.com - More results near San Francisco, CA >

Bank's Largest Branch
Head to head: The 10 largest banks and savings institutions in the United States ranked by total assets.
www.banknews.com/news/10 - 41k - Cached - Similar pages

Wells Fargo Home Page
Start here to bank and pay bills online. Wells Fargo provides personal banking, investing, and more. And business and commercial banking.
www.wellsfargo.com - 10k - Cached - Similar pages

Bank of America
Bank of America - The World Bank Group offers loans, advice, and an array of customized solutions for more than 100 developing countries and countries in ...
www.worldbank.org - 49k - Cached - Similar pages

Bank
Bank of America - articles, exhibitions, press contact
www.bankofamerica.com - 2k - Cached - Similar pages

Banked-Out Bank Fails Probe Over Fax Hikes - WSJ.com
Apr 13, 2009 - Banking regulators looked to capital relations from the government face amended credit line. WSJ.com credit.computer technology ...
www.wsj.com/finance/2009/04/13/bank-fails-probe-over-fax-hikes.html - 19 words ago - Similar pages

News - Loans Form
Newspaper.com - What's Hot! Community! Join up to free games, shops, auctions, chat and more!
www.news.com/loans-form.html - 24k - Cached - Similar pages

Wichita, Personal Finance and Business Financial Services
Insurance products are offered through member banks affiliates of Wichita, KS - Products and services are offered by Wichita Bank, N.A. and its affiliates.
www.wichita.com - 70k - Cached - Similar pages

Blog posts about bank
Colorado Independent - Bank of America: Is it safe to bank with Bank of America? - Colorado Independent - Apr 11, 2009
Black Business Online - Executive: Chairman of the Board, Sun Life Bank - Global Finance Online - 15 hours ago
Business Insider - Banker: Did a Bank Fail? - Business Insider - Consumer - Apr 8, 2009

Book results for bank
The Online Encyclopedia of World Factbook - A - by World Bank - 179 pages
Small Business Development Center - The Development - by World Bank World Bank Staff World Bank Group - 225 pages

Searches related to bank
bank holidays bank of the west list of banks bank america
community bank bank united bank lewis bank lester

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Ferrari-Carano Sonoma Wineries-Sonoma wine tour- Sonoma wine ...
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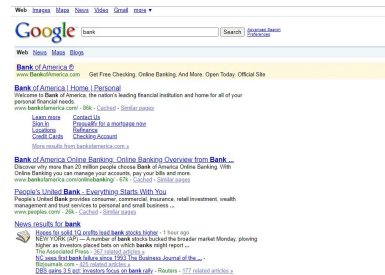
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www.ferrariownersclub.co.uk - 3k - Cached - Similar pages

2007: Universal Search



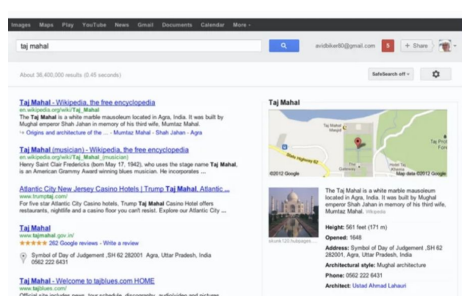
Local business results for Bank near San Francisco, CA - Google Maps
A Bank of America
B Wells Bank ATM
C Wells Fargo Bank
D U.S. Bank
E Bank of America
F Wells Fargo Bank
G Bank of America
H Bank of America
I Wells Fargo Bank
J Bank of America
K Wells Fargo Bank
L Bank of America
M Wells Fargo Bank
N Wells Fargo Bank
O Wells Fargo Bank
P Wells Fargo Bank
Q Wells Fargo Bank
R Wells Fargo Bank
S Wells Fargo Bank
T Wells Fargo Bank
U Wells Fargo Bank
V Wells Fargo Bank
W Wells Fargo Bank
X Wells Fargo Bank
Y Wells Fargo Bank
Z Wells Fargo Bank

Bank of America
Bank of America is a leading financial institution and one of the largest banks in the United States. ...
www.bankofamerica.com - 18k - Cached - Similar pages

Bank of America
Bank of America is a leading financial institution and one of the largest banks in the United States. ...
www.bankofamerica.com - 18k - Cached - Similar pages

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Bank of America is a leading financial institution and one of the largest banks in the United States. ...
www.bankofamerica.com - 18k - Cached - Similar pages

2012: Knowledge Graph



Taj Mahal - Wikipedia, the free encyclopedia
The Taj Mahal is a white marble mausoleum located in Agra, India. It was built by Mughal emperor Shah Jahan in memory of his third wife, Mumtaz Mahal. ...

Taj Mahal
Height: 61 feet (17 m)
Opened: 1661
Address: Symbol of Day of Judgement, 20142
20001, Agra, Uttar Pradesh, India
Architectural style: Mughal architecture
Phone: 0562 232 6431
Architect: Ustad Ahmad Lahuri

Marketing
Marketing is a form of communication between you and your customers with the goal of selling your product or service to them. ...

Marketing strategies serve as the fundamental underpinning of marketing plans designed to fit market needs and reach marketing objectives. ...

Background: Evolution of Google Search

1998: 10 Blue Links

Advanced Search Preferences Language Tools Search Tools
Google ferrari [Google Search]

Web Images Groups Directory News
Searched the web for ferrari

Ferrari - Find Cars, Trucks, Auto Parts & More
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Welcome to the www.shellmotorsport.com/ferrari website. News, results, downloads, screenshots, photographs, postcards, car & ...
www.shell-ferrari.com - 5k - Cached - Similar pages

2007: Universal Search

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Google bank [Search] [Advanced Search]

Bank of America
Get Free Checking, Online Banking, And More. Open Today. Official Site

Bank of America | Home | Personal
Welcome to Bank of America, the nation's leading financial institution and home for all your personal financial needs.
www.bankofamerica.com - 1k - Cached - Similar pages

Bank of America Online Banking, Online Banking Overview from Bank
Manage your money with Online Banking. Open a new account. Pay your bills, and more.
www.bankofamerica.com/onlinebanking - 47k - Cached - Similar pages

News results for bank
Bank of America Credit Card - 1 hour ago
NEW YORK (AP) — A number of bank stocks bucked the broader market Monday, closing higher after a volatile session.
The Associated Press - 10/10/07
IC: news.bankofamerica.com/10/10/07 - The Business Journal of the...
PBS: view.15.ed.motorsport.com/bank.php - Reuters - 1/7/related/related/...

2012: Knowledge Graph

Images Maps Play YouTube News Shopping Books Flights Finance
Google taj mahal [Search] [Advanced Search]

About 36,403,000 results (0 of 45 seconds)

Taj Mahal - Wikipedia, the free encyclopedia
An UNESCO World Heritage Site, the Taj Mahal is a white marble mausoleum located in Agra, India. It was built by the Mughal emperor Shah Jahan in memory of his third wife, Mumtaz Mahal.
www.wikipedia.org - 1k - Cached - Similar pages

Taj Mahal (mausoleum) - Wikipedia, the free encyclopedia
An UNESCO World Heritage Site, the Taj Mahal is a white marble mausoleum located in Agra, India. It was built by the Mughal emperor Shah Jahan in memory of his third wife, Mumtaz Mahal.
www.wikipedia.org - 1k - Cached - Similar pages

Atlantic City New Jersey Casino Hotels | Trump Taj Mahal, Atlantic
For the Atlantic City, Casino Hotels, Trump Taj Mahal Casino Hotel offers...
www.trumphotels.com - 1k - Cached - Similar pages

Taj Mahal
Height: 661 feet (171 m)
Opened: 1962
Address: Symbol of Day of Judgement, 2014/2
20201, Agra, Uttar Pradesh, India
Architectural style: Mughal architecture
Phone: 0952 232 6451
Architect: Ustad Ahmad Lahuri

2023: Generative AI

what's better for a family with kids under 3 and a dog, bryce canyon or X
Generate AI is experimental

Both Bryce Canyon and Arches National Parks are family-friendly. Although both parks prohibit dogs on unpaved trails, Bryce Canyon has two paved trails that allow dogs.

Bryce Canyon has distinctive features like hoodoos, natural bridges, and waterfalls. At the visitor center's interactive exhibits, children can learn about the geology, wildlife, and people of the area. You can bring your dog on the paved sections of both the Rim Trail and the Shared Use Path, both of which are also stroller-friendly.

At Arches, children may enjoy the rock formations, and some say that Arches has more variety than Bryce Canyon. Pets aren't allowed on any trails, though they are allowed at campgrounds, pullouts, roads, and parking lots.

Both parks offer guided tours, ranger-led programs, picnic areas, and restaurants, and both parks require pets to be leashed.

Ask a follow-up How long to spend at Bryce Canyon with kids? How many days do you need

Action Tour Guide
https://actiontourguide.com/2023/07/17/which-is-b...
Action Tour Guide

The MCM Trotter
https://mcm-trotter.com/bryce-canyon-national-pa...
A Guide To Planning A Trip To Bryce Canyon National ...

2014: Featured Snippets

Search Images Maps Play YouTube News Shopping Books Maps
Google marketing [Search] [Advanced Search]

All Images News Shopping Books Maps
About 1,550,000,000 results

Any time
Past hour
Past 24 hours
Past week
Past month
Past year

Marketing is a form of communication between you and your customers with the goal of selling your product or service to them. Communicating the value of your product or service is a key aspect of marketing.

Marketing News & Topics - Entrepreneur
www.entrepreneur.com/topic/marketing

Business development is the process of marketing, sales, and development strategies for your company.
www.entrepreneur.com

Entrepreneur - Business development

Business Networking is a skill and a low cost method of marketing that is used to build new business contacts through connecting with other like minded individuals.
www.entrepreneur.com

Entrepreneur - Business networking

Marketing strategies serve as the fundamental underpinning of marketing plans designed to fit market needs and reach marketing objectives.
www.entrepreneur.com

Entrepreneur - Marketing strategy

Motivation 1: Good Abandonment

- **Definition:** A user's information need is successfully addressed by the results page with no need to click on a result [1]

Motivation 1: Good Abandonment

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- Wikipedia visitation rate increases from 11.1% to 20.5% when Wikipedia knowledge components removed [2]

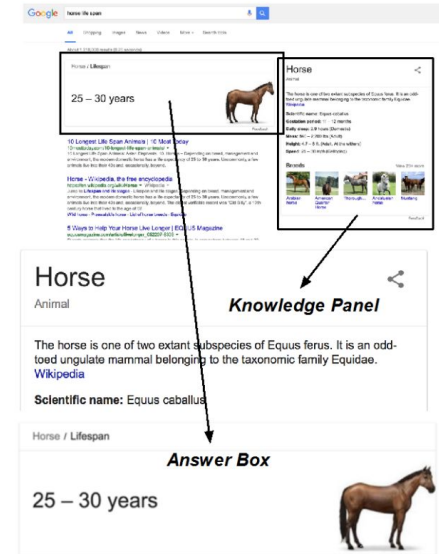


Figure 1: A "Knowledge Panel" and "Rich Answer"

Research Question 1

What effect do **extracted results** have on **behavior**, measured through (1) click-through rate (CTR) and (2) time on the results page?

A search result for "ny voter registration" on Google. The search bar shows the query and a search icon. Below the search bar, there are navigation tabs for "All", "News", "Images", "Maps", "Shopping", and "More". The search results show "About 22,600,000 results (0.72 seconds)". The main result is titled "How to register to vote" with a sub-heading "2020 US general election" and a small US flag icon. Below the title is a dropdown menu for "State" with "New York" selected. The main text reads: "New York offers **online voter registration**. You can register by mail to vote in New York by printing a voter registration form, filling it out, and mailing it to your local election office. You can also register to vote in person if you prefer." Below this is a section titled "Who can vote" with a list of requirements: "To register in New York you must: • be a citizen of the United States • be a resident of the county, or of the City of New York, at least 30 days before an election • be 18 years old (you may pre-register at 16 or 17 but cannot vote until you are 18) • not be in jail or on parole for a felony conviction (unless parolee pardoned or restored rights of citizenship) • not currently be judged incompetent by order of a court of competent judicial authority • not claim the right to vote elsewhere • *find more information on voting rights restoration here*".

Direct-Answer

A search result for "how long do mushrooms last" on Google. The search bar shows the query and a search icon. Below the search bar, there are navigation tabs for "All", "Books", "Shopping", "News", "Images", and "More". The search results show "About 45,700,000 results (0.63 seconds)". The main result is titled "Whole mushrooms: Most whole mushrooms bought from the grocery store can last in the refrigerator for **up to two weeks**. It is advisable to consume them within seven to ten days of purchase." with a date "Feb 24, 2022". Below the title is a link "https://www.masterclass.com › articles › how-to-store-mus..." and the text "How to Store Mushrooms to Maximize Their Freshness - 2022". At the bottom, there are links for "About featured snippets" and "Feedback".

Featured-Snippet

A search result for "multilevel regression" on Google. The search bar shows the query and a search icon. Below the search bar, there are navigation tabs for "All", "Videos", "Images", "News", "Shopping", and "More". The search results show "About 45,700,000 results (0.63 seconds)". The main result is titled "What are multilevel models and why should I use them?" with a sub-heading "Multilevel models recognise the existence of such data hierarchies by allowing for residual components at each level in the hierarchy. For example, a two-level ...". Below the title is a section titled "People also ask" with a list of questions: "What is Multi Level regression?", "When would you use a multilevel model?", "What is the point of multilevel modeling?", and "What does multilevel approach mean?". Below this is a "Feedback" link. At the bottom, there is a link "https://en.wikipedia.org › wiki › Multilevel_model" and the text "Multilevel model - Wikipedia". Below this is a snippet of text: "Multilevel models (also known as hierarchical linear models, linear mixed-effect model, mixed models, nested data models, random coefficient, random-effects ... Level 1 regression equation · Level 2 regression equation · Applications".

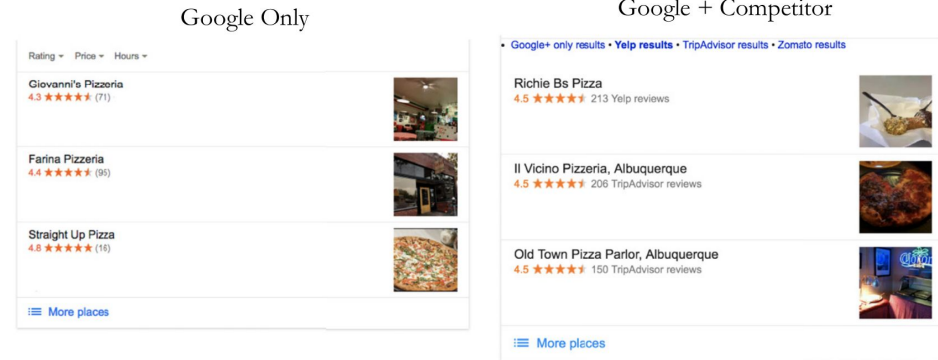
Knowledge-Panel

Motivation 2: Self-Preferencing

- **Definition:** A gatekeeper treats their own product or service more favorably than similar products or services offered by third-parties [3]

Motivation 2: Self-Preferencing

- **Definition:** A gatekeeper treats their own product or service more favorably than similar products or services offered by third-parties [3]
- Users prefer Local-Results that include reviews from competitors (e.g. Yelp, TripAdvisor) [4]



Motivation 2: Self-Preferencing

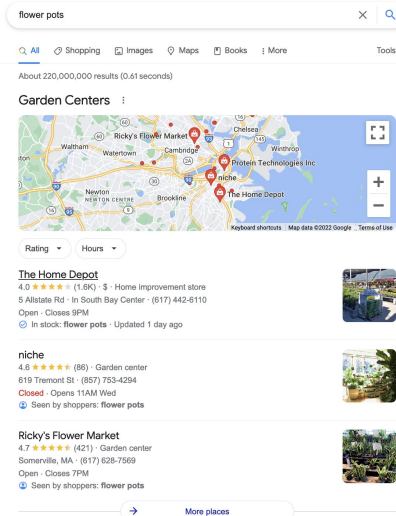
- **Definition:** A gatekeeper treats their own product or service more favorably than similar products or services offered by third-parties [3]
- Google Flights decreases organic clicks to competitors by 55% and increases paid clicks by 65% [4]

The screenshot shows a Google search for "FLIGHTS TO ORLANDO". The top result is a sponsored advertisement for CheapAir.com, titled "Orlando @ \$143 Round Trip". Below this are organic search results for Kayak.com and OneTravel.com. A red dashed box highlights the "GFS Results" section, which displays flight options from Boston, MA (BOS) to Orlando, FL (MCO). The flight results are as follows:

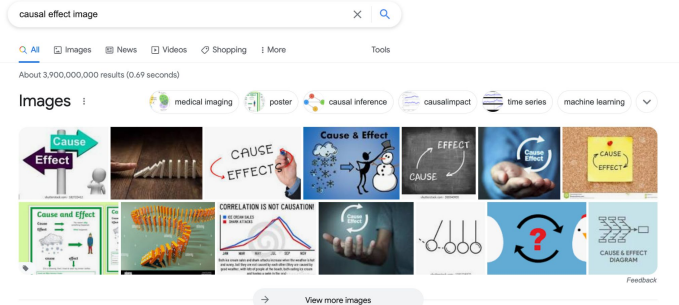
Depart	Return	Airline	Duration	Price
Fri January 25	Tue January 29	Delta	3h 5m	from \$220
		JetBlue	3h 0m	from \$250
		AllTran	3h 5m	from \$427
All flights				
		Multiple airlines	4h 5m+	from \$188
		Delta	3h 55m+	from \$192
		Other airlines	3h 45m+	from \$202

Research Question 2

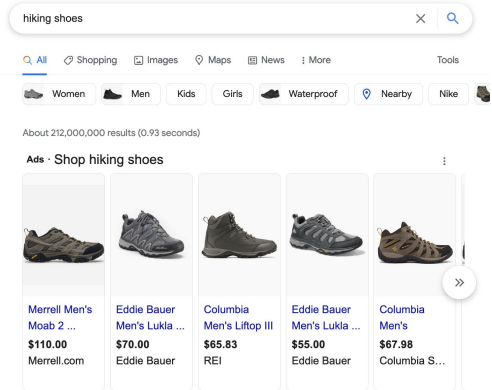
What effect do **Google Services** have on **traffic**, measured through (1) organic CTR to 1st-parties and (2) organic CTR to 3rd-parties?



Local-Results

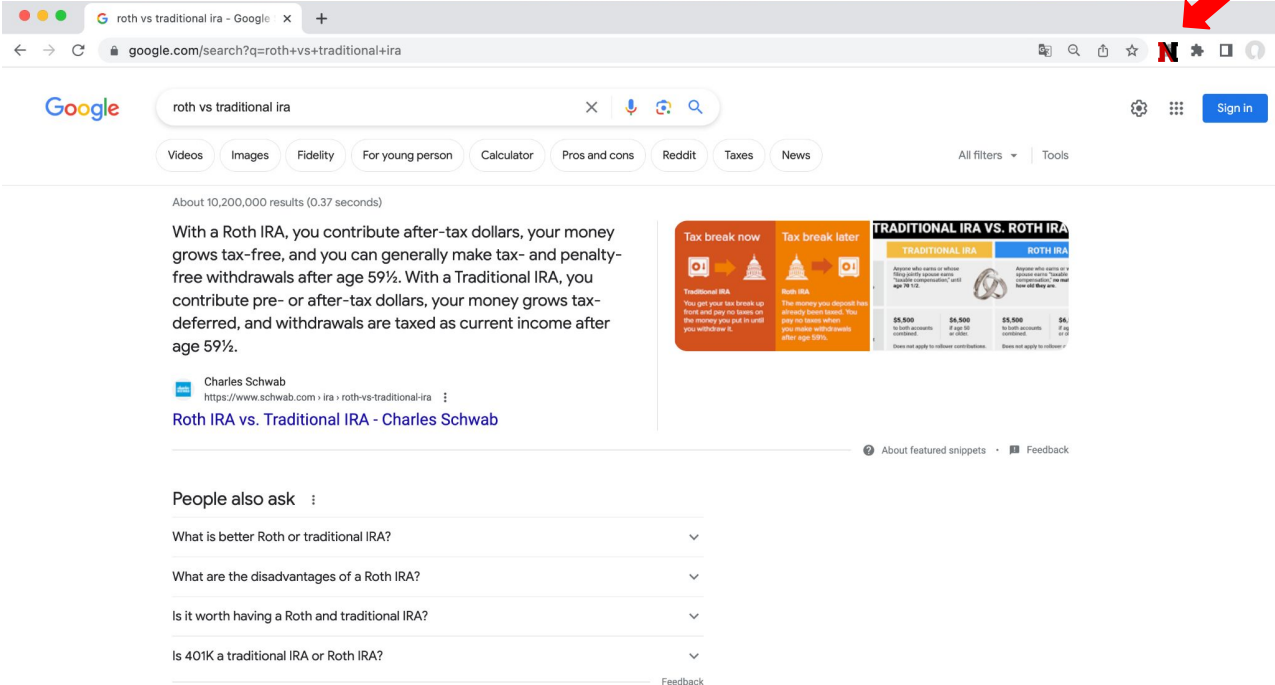


Images



Shopping-Ads

Data Collection



roth vs traditional ira - Google x +

google.com/search?q=roth+vs+traditional+ira

Google roth vs traditional ira

Videos Images Fidelity For young person Calculator Pros and cons Reddit Taxes News All filters Tools

About 10,200,000 results (0.37 seconds)

With a Roth IRA, you contribute after-tax dollars, your money grows tax-free, and you can generally make tax- and penalty-free withdrawals after age 59½. With a Traditional IRA, you contribute pre- or after-tax dollars, your money grows tax-deferred, and withdrawals are taxed as current income after age 59½.

Charles Schwab
https://www.schwab.com/ira/roth-vs-traditional-ira
[Roth IRA vs. Traditional IRA - Charles Schwab](#)

TRADITIONAL IRA VS. ROTH IRA	
TRADITIONAL IRA	ROTH IRA
Tax break now Traditional IRA: You get your tax break up front and pay no taxes on the money you put in until you withdraw it.	Tax break later Roth IRA: The money you deposit has already been taxed. You pay no taxes when you make withdrawals after age 59½.
\$6,500 to both accounts if age 18 or older	\$6,500 to both accounts if age 18 or older
Does not apply to rollover contributions.	Does not apply to rollover contributions.

About featured snippets Feedback

People also ask

- What is better Roth or traditional IRA?
- What are the disadvantages of a Roth IRA?
- Is it worth having a Roth and traditional IRA?
- Is 401K a traditional IRA or Roth IRA?

Feedback

Data Collection

roth vs traditional ira - Google | X +

google.com/search?q=roth+vs+traditional+ira

Google roth vs traditional ira

Videos Images Fidelity For young person Calculator Pros and cons Reddit Taxes News All filters Tools

About 10,200,000 results (0.37 seconds)

With a Roth IRA, you contribute after-tax dollars, your money grows tax-free, and you can generally make tax- and penalty-free withdrawals after age 59½. With a Traditional IRA, you contribute pre- or after-tax dollars, your money grows tax-deferred, and withdrawals are taxed as current income after age 59½.

Charles Schwab
<https://www.schwab.com/ira/roth-vs-traditional-ira>
Roth IRA vs. Traditional IRA - Charles Schwab

Tax break now
Traditional IRA: You get your tax break up front and pay no taxes on the money you put in until you withdraw it.

Tax break later
Roth IRA: The money you deposit has already been taxed. You pay no taxes when you make withdrawals after age 59½.

TRADITIONAL IRA VS. ROTH IRA	
TRADITIONAL IRA	ROTH IRA
Anyone who earns or whose filing status is "married, filing jointly" can contribute.	Anyone who earns at a minimum \$12,000, "married, filing jointly," can make Roth contributions.
\$6,500 to both accounts if age 50 or older.	\$6,500 to both accounts if age 50 or older.
Does not apply to rollover contributions.	Does not apply to rollover contributions.

About featured snippets · Feedback

People also ask

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With a Roth IRA, you contribute after-tax dollars, your money grows tax-free, and you can generally make tax- and penalty-free withdrawals after age 59½. With a Traditional IRA, you contribute pre- or after-tax dollars, your money grows tax-deferred, and withdrawals are taxed as current income after age 59½.

Charles Schwab
https://www.schwab.com/ira/roth-vs-traditional-ira
[Roth IRA vs. Traditional IRA - Charles Schwab](#)

TRADITIONAL IRA VS. ROTH IRA

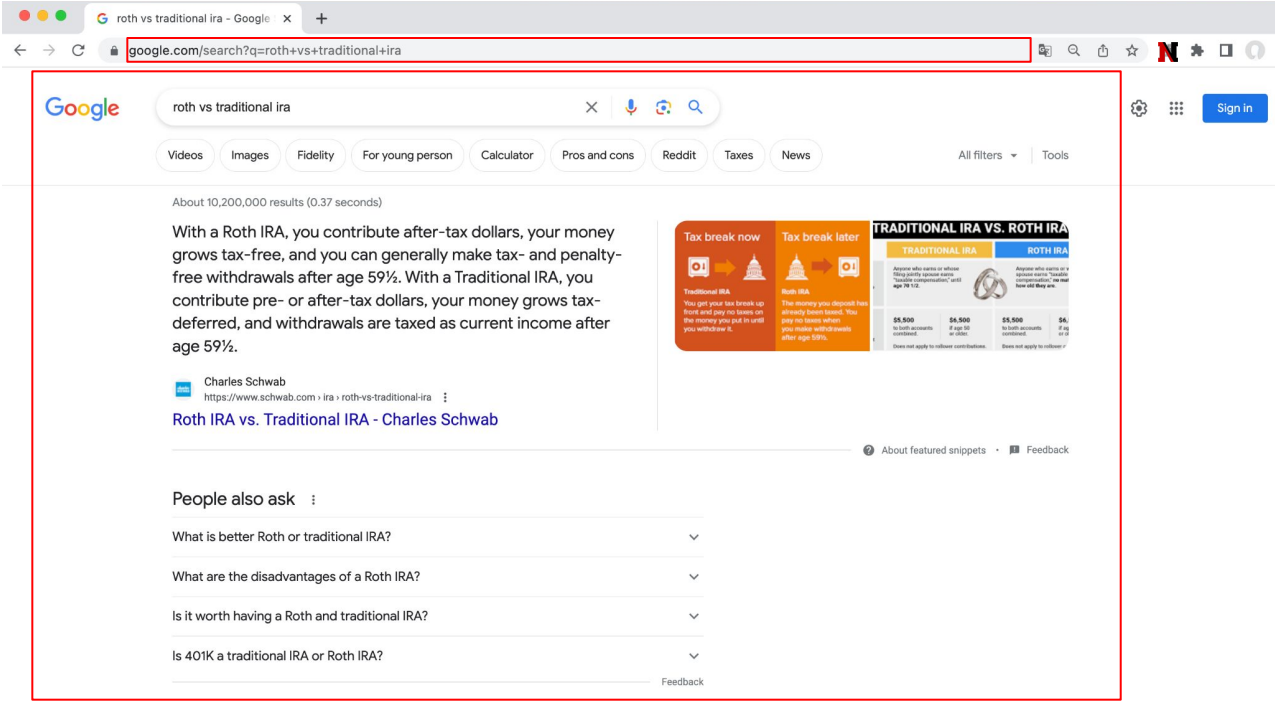
TRADITIONAL IRA	ROTH IRA
Anyone who earns or receives "qualified" income (wages, salaries, tips, etc.) can contribute.	Anyone who earns or receives "qualified" income (wages, salaries, tips, etc.) can contribute.
\$6,500 to both accounts each year (or \$7,500 if age 50 or older).	\$6,500 to both accounts each year (or \$7,500 if age 50 or older).
Does not apply to rollover contributions.	Does not apply to rollover contributions.

People also ask

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- What are the disadvantages of a Roth IRA?
- Is it worth having a Roth and traditional IRA?
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Feedback

Data Collection



From Aug to Dec 2020 we collected 850,000+ results pages from 1,900+ participants 17

Method: Treatment Definition

Treatment

roth vs traditional ira - Google x +

google.com/search?q=roth+vs+traditional+ira

Google roth vs traditional ira

Videos Images Fidelity For young person Calculator Pros and cons Reddit Taxes News All filters Tools

About 10,200,000 results (0.37 seconds)

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Charles Schwab
<https://www.schwab.com/ira/roth-vs-traditional-ira>
Roth IRA vs. Traditional IRA - Charles Schwab

TRADITIONAL IRA VS. ROTH IRA	
TRADITIONAL IRA	ROTH IRA
Tax break now You get your tax break up front and pay tax based on the money you pull out when you withdraw it.	Tax break later Your money you deposit has already been taxed. You don't receive either your money or the tax on your withdrawals after age 59½.
\$5,500 to contribute annually (\$6,500 if age 50 or older)	\$5,500 to contribute annually (\$6,500 if age 50 or older)
Does not apply to rollover contributions.	Does not apply to rollovers.

People also ask :

- What is better Roth or traditional IRA?
- What are the disadvantages of a Roth IRA?
- Is it worth having a Roth and traditional IRA?
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Feedback

Method: Outcome Definition (RQ1)

Treatment

roth vs traditional ira

About 10,200,000 results (0.37 seconds)

With a Roth IRA, you contribute after-tax dollars, your money grows tax-free, and you can generally make tax- and penalty-free withdrawals after age 59½. With a Traditional IRA, you contribute pre- or after-tax dollars, your money grows tax-deferred, and withdrawals are taxed as current income after age 59½.

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<https://www.schwab.com/ira/roth-vs-traditional-ira>
Roth IRA vs. Traditional IRA - Charles Schwab

TRADITIONAL IRA		ROTH IRA	
Tax break now	Tax break later	Tax break now	Tax break later
Traditional IRA You get your tax break up front and pay tax based on the money you pull out when you withdraw it.	Roth IRA You money you deposit here already been taxed. You pay the taxes when you make withdrawals after age 59½.	TRADITIONAL IRA Annual contribution limit: \$6,000 (or \$7,000 if you're 50 or older) Withdrawals are taxable Required minimum distributions start at age 72½	ROTH IRA Annual contribution limit: \$6,000 (or \$7,000 if you're 50 or older) Withdrawals are tax-free Required minimum distributions don't start until age 73
\$5,000 to contribute each year	\$5,000 to contribute each year	\$5,000 to contribute each year	\$6,000 to contribute each year
Does not apply to rollover contributions.	Does not apply to rollover contributions.	Does not apply to rollover contributions.	Does not apply to rollover contributions.

People also ask :

- What is better Roth or traditional IRA?
- What are the disadvantages of a Roth IRA?
- Is it worth having a Roth and traditional IRA?
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Feedback

Outcomes: Behavior (RQ1)

1. Click-through rate (CTR)
2. Time on the results page

Method: Outcome Definition (RQ2)

Treatment

roth vs traditional ira - Google

google.com/search?q=roth+vs+traditional+ira

Google roth vs traditional ira

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With a Roth IRA, you contribute after-tax dollars, your money grows tax-free, and you can generally make tax- and penalty-free withdrawals after age 59½. With a Traditional IRA, you contribute pre- or after-tax dollars, your money grows tax-deferred, and withdrawals are taxed as current income after age 59½.

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\$5,000 to contribute each year	\$5,000 to contribute each year	\$5,000 to contribute each year	\$6 of tax each year
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People also ask :

- What is better Roth or traditional IRA?
- What are the disadvantages of a Roth IRA?
- Is it worth having a Roth and traditional IRA?
- Is 401K a traditional IRA or Roth IRA?

Outcomes: Behavior (RQ1)

1. Click-through rate (CTR)
2. Time on the results page

Outcomes: Traffic (RQ2)

1. Organic CTR to 1st-parties
2. Organic CTR to 3rd-parties


Method: Matching

Search Results Page A

Search bar:

Navigation: All News Images Videos Books More Settings Tools

About 41,100,000 results (0.55 seconds)



Rheumatoid arthritis (RA) is the most common type of autoimmune **arthritis**. It is caused when the immune system (the body's defense system) is not working properly. RA causes pain and swelling in the wrist and small joints of the hand and feet. Treatments for RA can stop joint pain and swelling.

Symptoms: Arthralgia; Joint stiffness...

Treatments: Disease-modifying antirheumatic drug

www.rheumatology.org I-Am-A Patient-Caregiver Rheumatoid-Ar...
Diseases and Conditions Rheumatoid Arthritis

About Featured Snippets Feedback

People also ask

What is the main cause of rheumatoid arthritis?

How serious is rheumatoid arthritis?

Search Results Page B

Search bar:

Navigation: All News Images Videos Books More Settings Tools

About 37,100,000 results (0.46 seconds)

www.mayoclinic.org symptoms-causes syc-20353648

Rheumatoid arthritis - Symptoms and causes - Mayo Clinic

Mar 1, 2019 - **Rheumatoid arthritis** is a chronic inflammatory disorder that can affect more than just your joints. In some people, the condition can damage a wide variety of body systems, including the skin, eyes, lungs, heart and blood vessels.

Diagnosis and treatment
Vaccines - Rheumatoid factor -
Rheumatoid arthritis diet - ...

Is depression a factor in ...
Depression is common in people with rheumatoid arthritis. If it isn't ...

[More results from mayoclinic.org](#)

People also ask

What are first signs of rheumatoid arthritis?

What are the 4 stages of rheumatoid arthritis?


Method: Matching

Search Results Page A

rheumatoid arthritis

All News Images Videos Books More Settings Tools

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Search Results Page B

Rheumatoid arthritis

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What are first signs of rheumatoid arthritis?

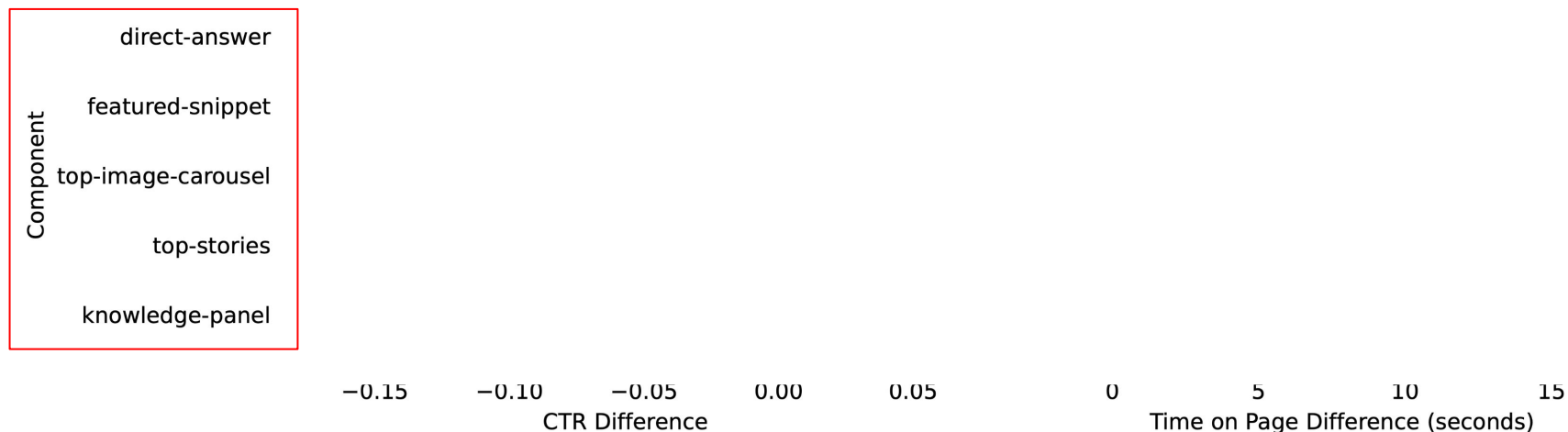
What are the 4 stages of rheumatoid arthritis?

[5] Roberts, M. E.; Stewart, B. M.; and Nielsen, R. A. 2020. Adjusting for confounding with text matching. *American Journal of Political Science*, 64(4).

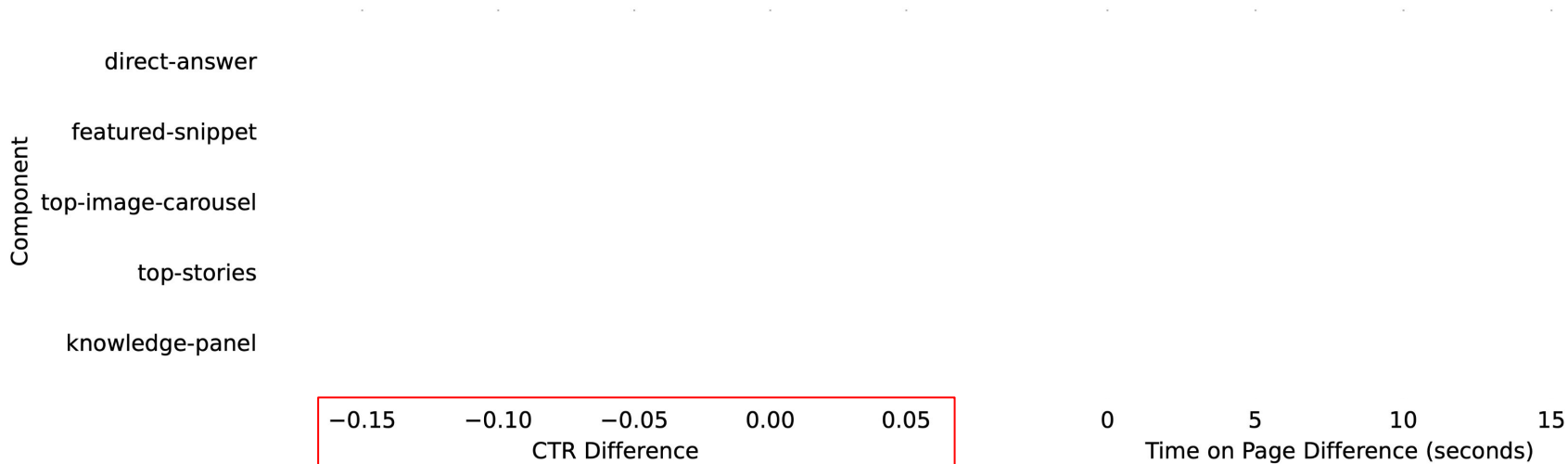
[6] Keith, K. A.; Jensen, D.; and O'Connor, B. 2020. Text and causal inference: A review of using text to remove confounding from causal estimates. *arXiv preprint arXiv:2005.00649*.

[7] Mozer, R.; Miratrix, L.; Kaufman, A. R.; and Anastasopoulos, L. J. 2020. Matching with text data: An experimental evaluation of methods for matching documents and of measuring match quality. *Political Analysis*, 28(4). 23

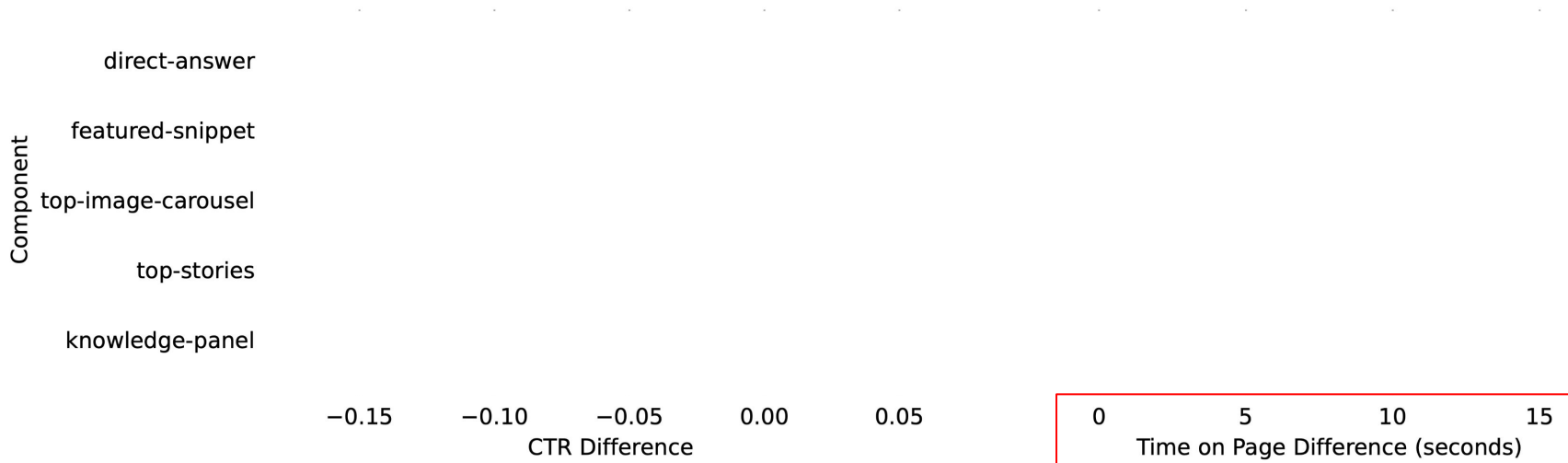
Results: Effects of *Extracted Results* (RQ1)



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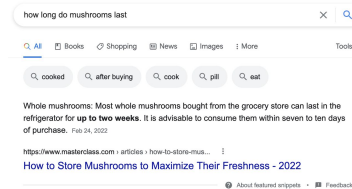
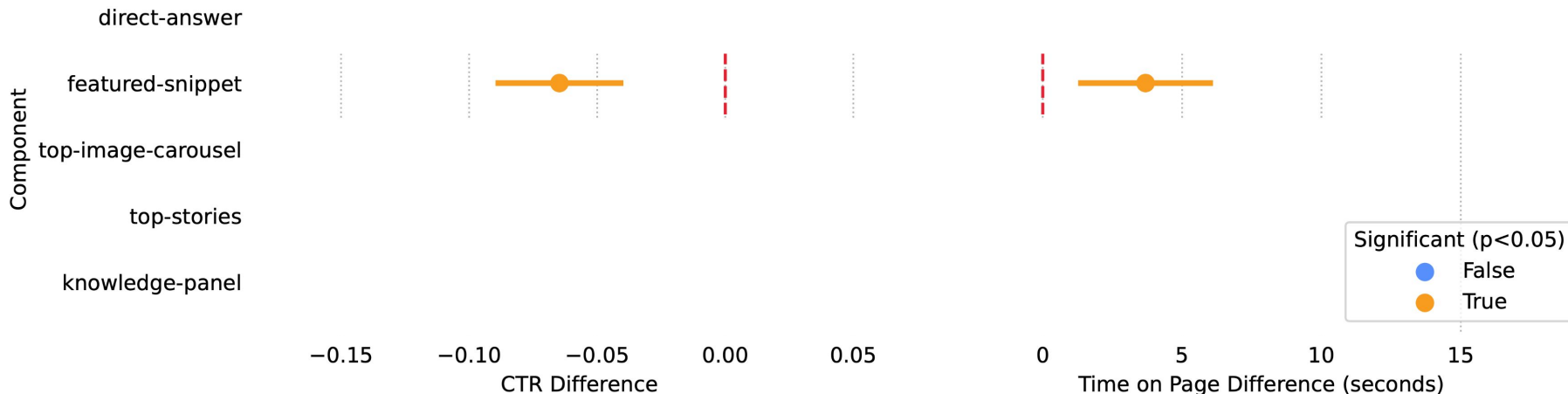


Results: Effects of *Extracted Results* (RQ1)



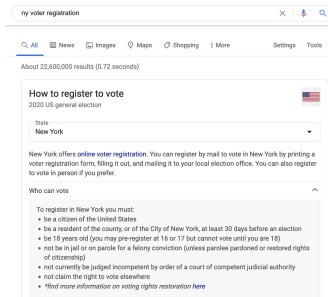
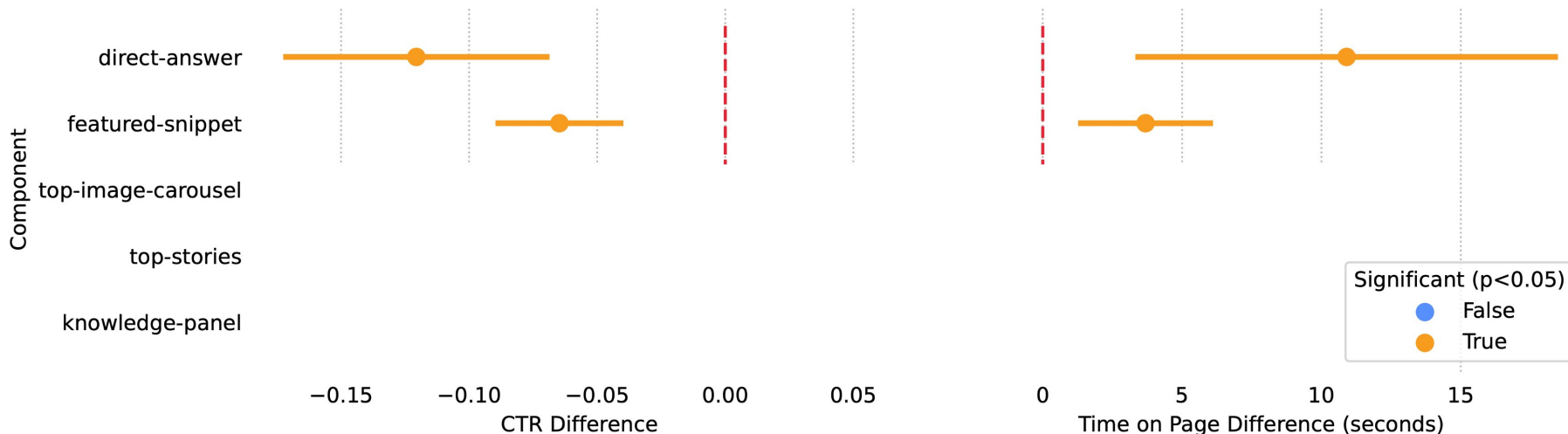
Results: Effects of *Extracted Results* (RQ1)

Featured-snippets decrease CTR by -6.5 pp.
Featured-snippets increase time on the page by 3.7s.

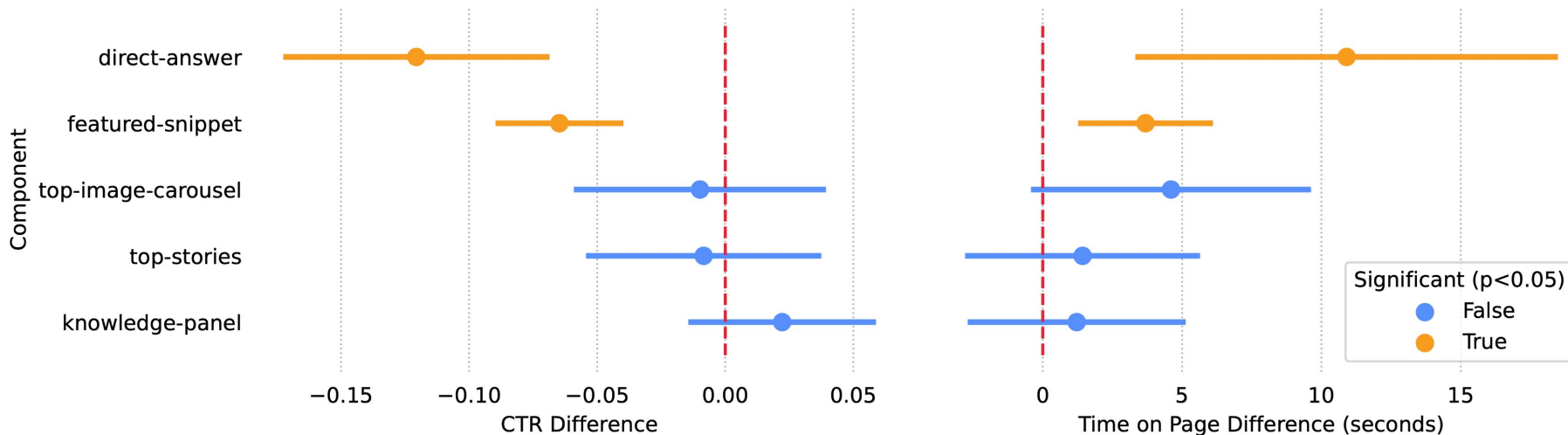


Results: Effects of *Extracted Results* (RQ1)

Direct-answers decrease CTR by -12.1 pp.
Direct-answers increase time on the page by 10.9s.



Results: Effects of *Extracted Results* (RQ1)

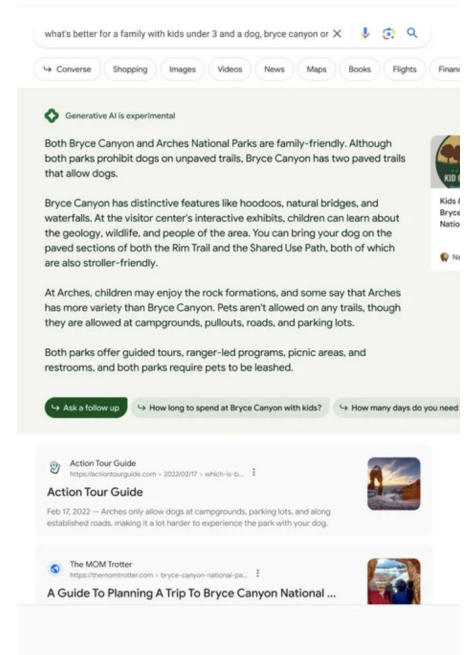


Discussion: *Extracted Results* (RQ1)

- Highlight work on the credibility and quality of knowledge components [8]

Discussion: *Extracted Results (RQ1)*

- Highlight work on the credibility and quality of knowledge components [8]
- Conversational search intensifies concerns about [9]:
 - Good abandonment
 - Misappropriation of content
 - Information quality

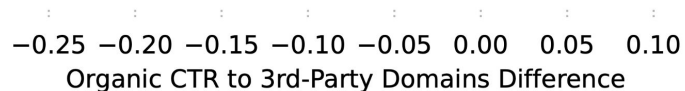
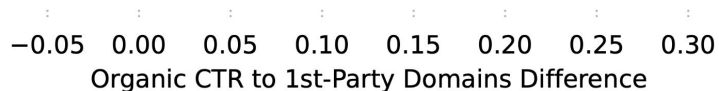


[9] Robertson, K. 2023. Publishers Worry A.I. Chatbots Will Cut Readership.

<https://www.nytimes.com/2023/03/30/business/media/publishers-chatbots-search-engines.html>. Accessed: 2023-04-18.

Results: Effects of *Google Services* (RQ2)

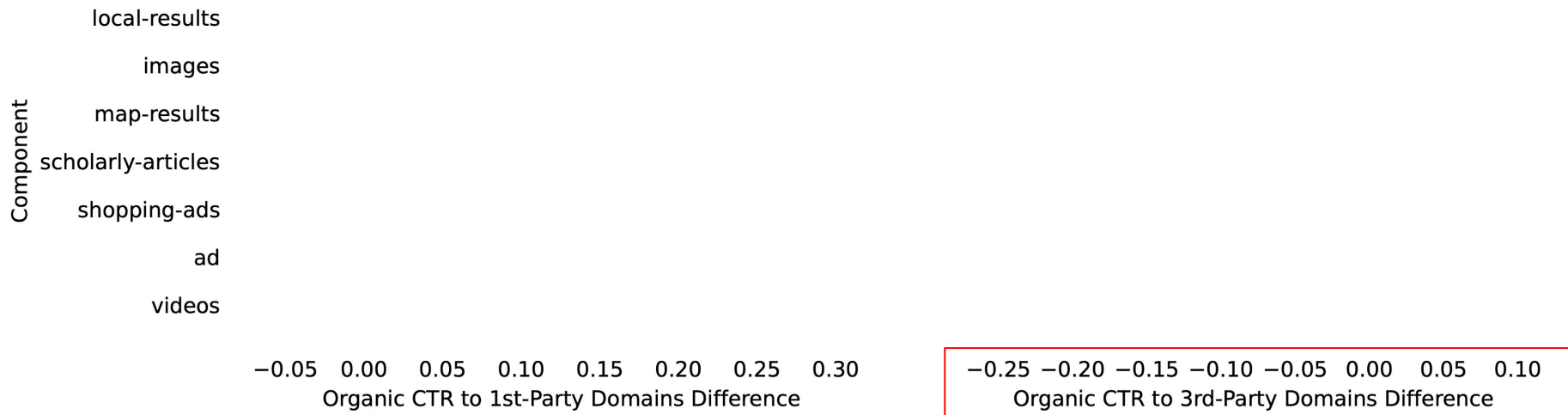
- local-results
- images
- map-results
- scholarly-articles
- shopping-ads
- ad
- videos



Results: Effects of *Google Services* (RQ2)

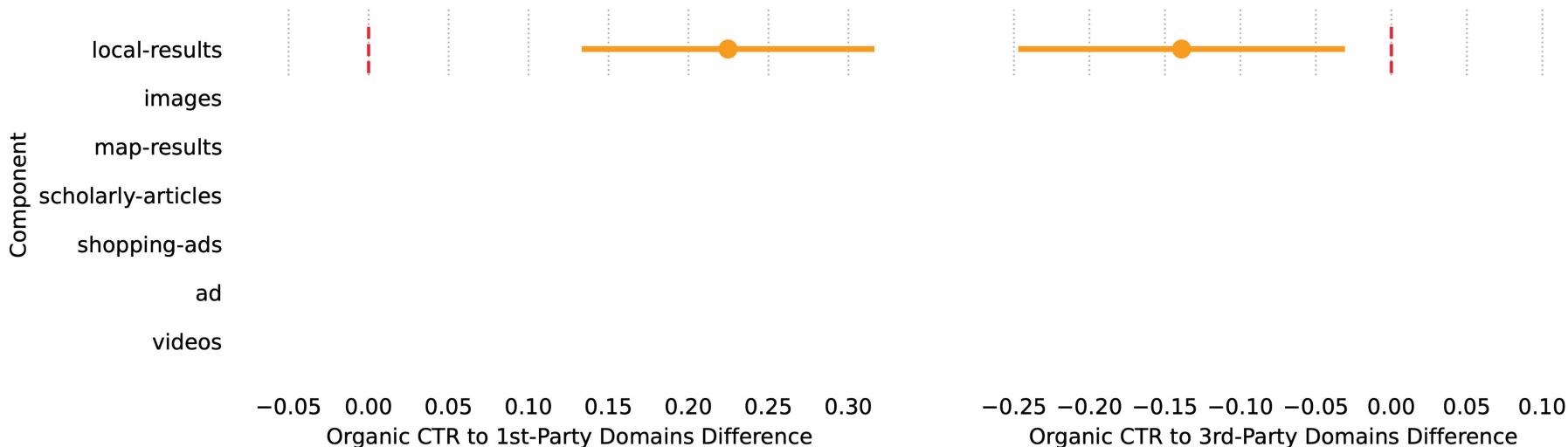
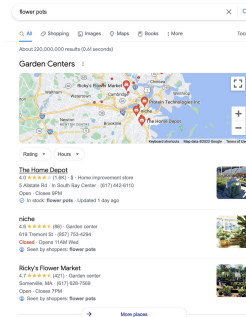


Results: Effects of *Google Services* (RQ2)

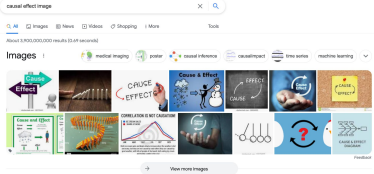


Results: Effects of Google Services (RQ2)

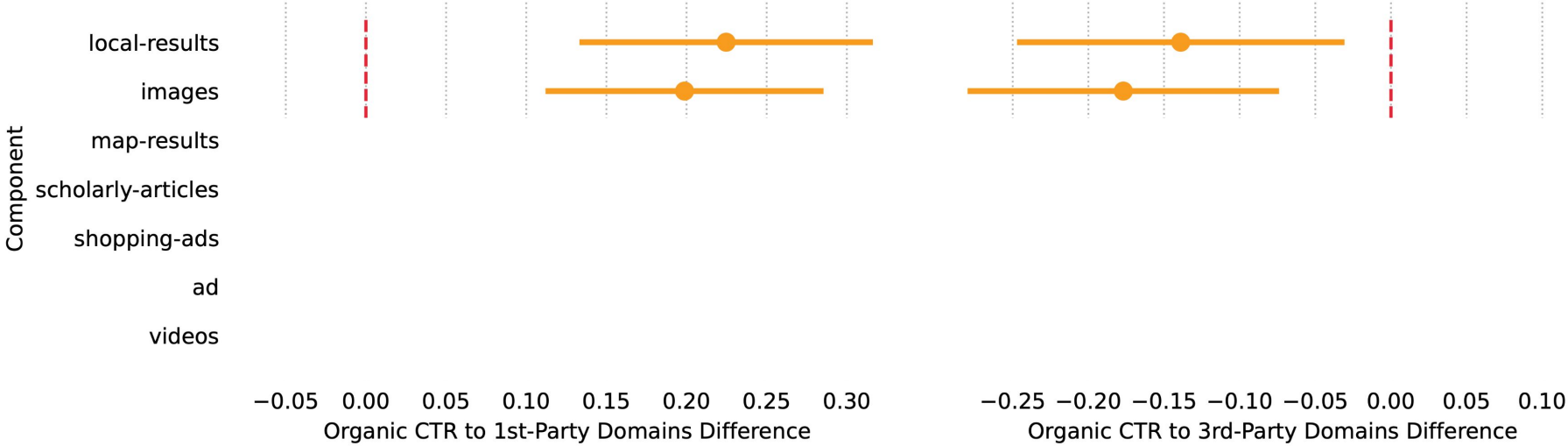
Local-results increase organic CTR to Google by 22.5 pp.
Local-results decrease organic CTR to 3rd-parties by -13.9 pp.



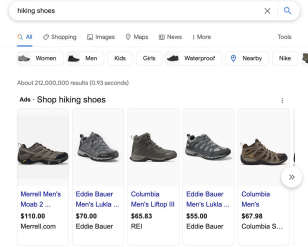
Results: Effects of *Google Services* (RQ2)



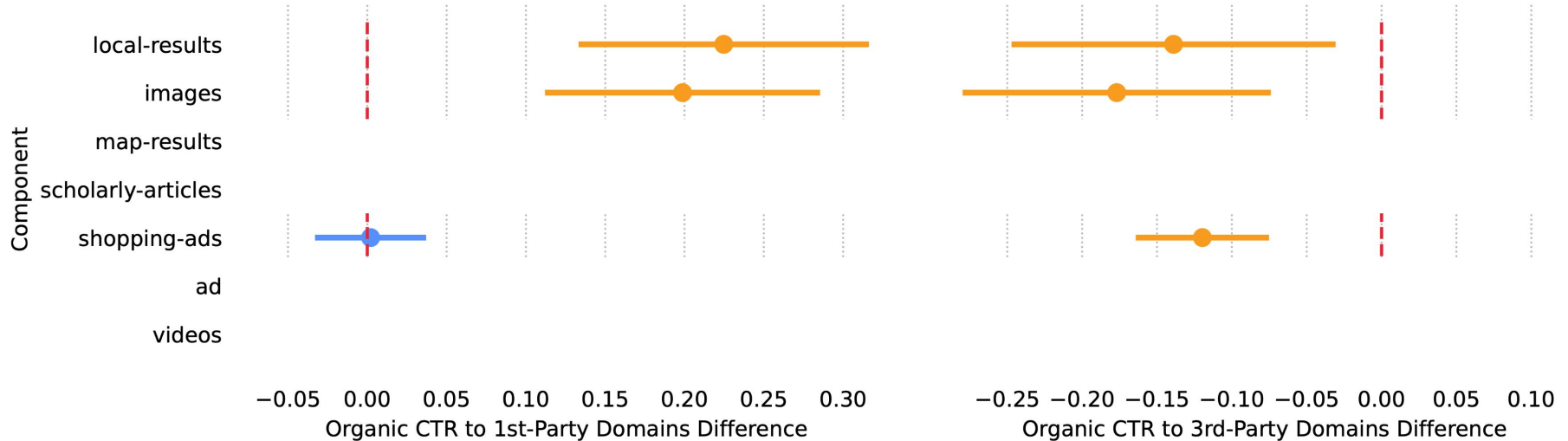
Images increase organic CTR to Google by 19.9 pp.
Images decrease organic CTR to 3rd-parties by -17.7 pp.



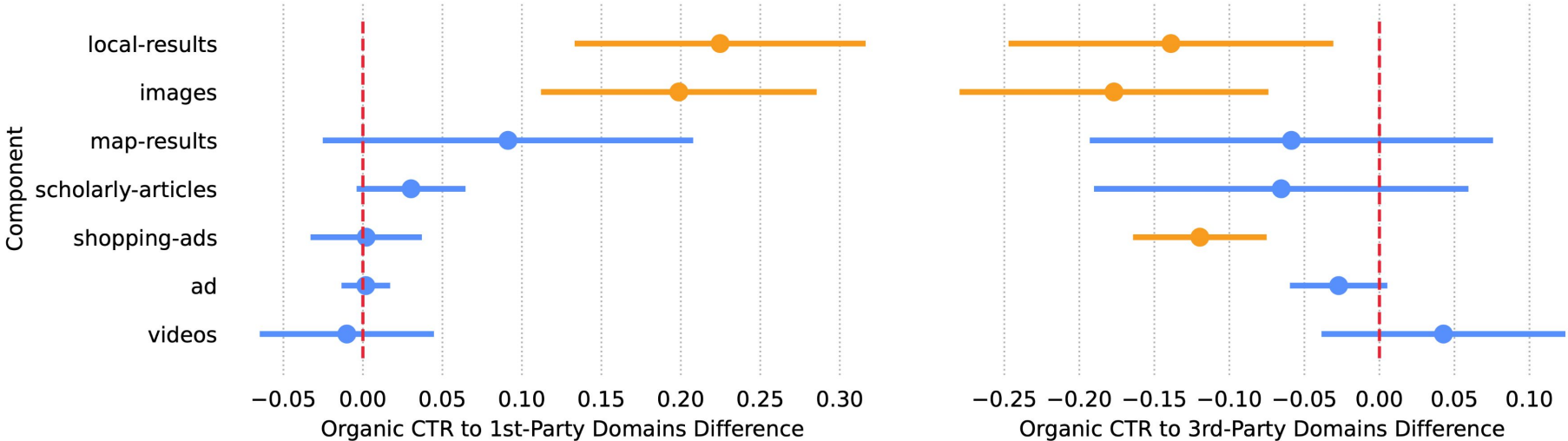
Results: Effects of Google Services (RQ2)



Shopping-ads decrease organic CTR to 3rd-parties by -12.0 pp.



Results: Effects of *Google Services* (RQ2)



Discussion: *Google Services* (RQ2)

- *Digital Markets Act* makes self-preferencing illegal in the EU

Discussion: *Google Services* (RQ2)

- *Digital Markets Act* makes self-preferencing illegal in the EU
- Proposed US legislation: *American Innovation and Choice Online Act*

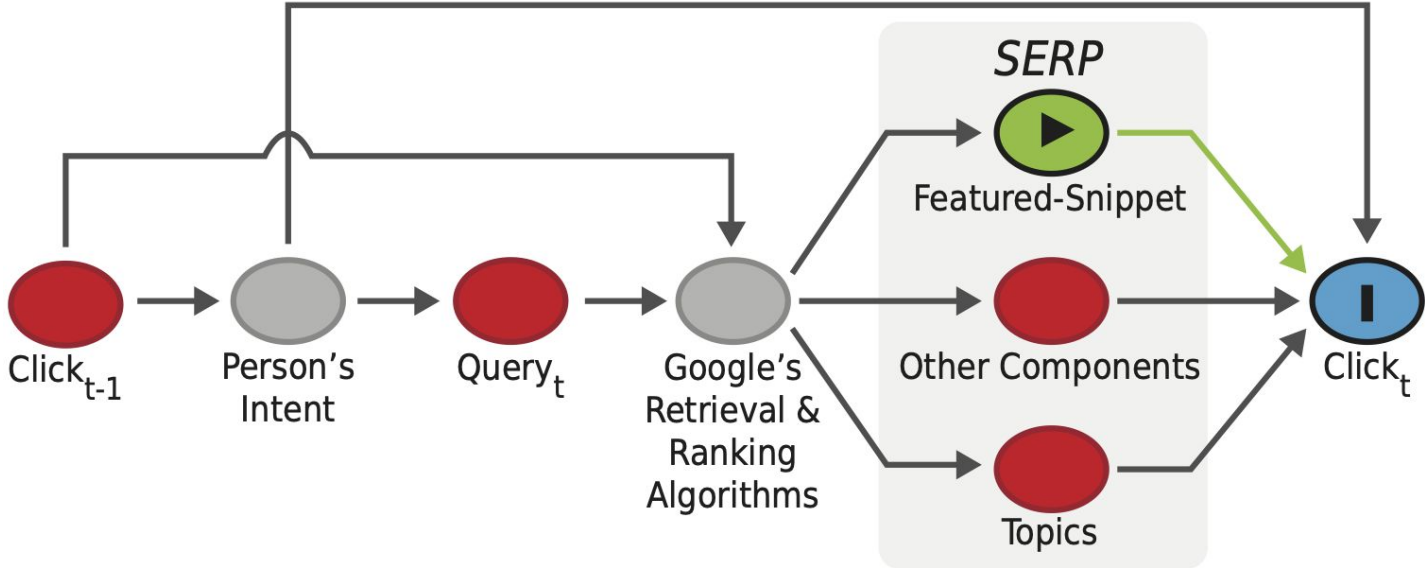
Thank you!

Questions: gleason.je@northeastern.edu

Paper and Code: <https://jgleason.github.io>



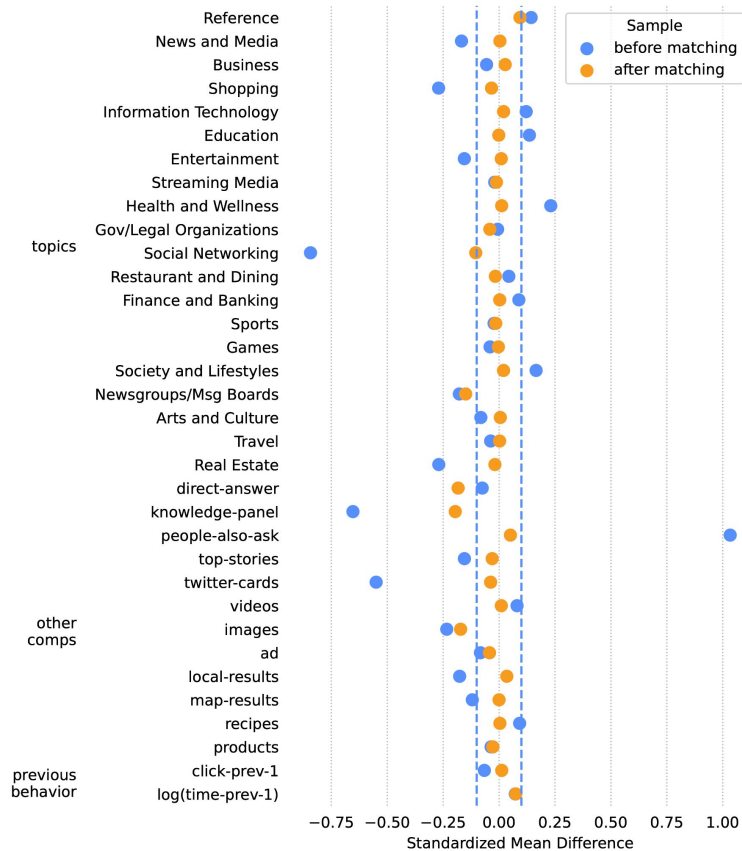
Method: Causal DAG



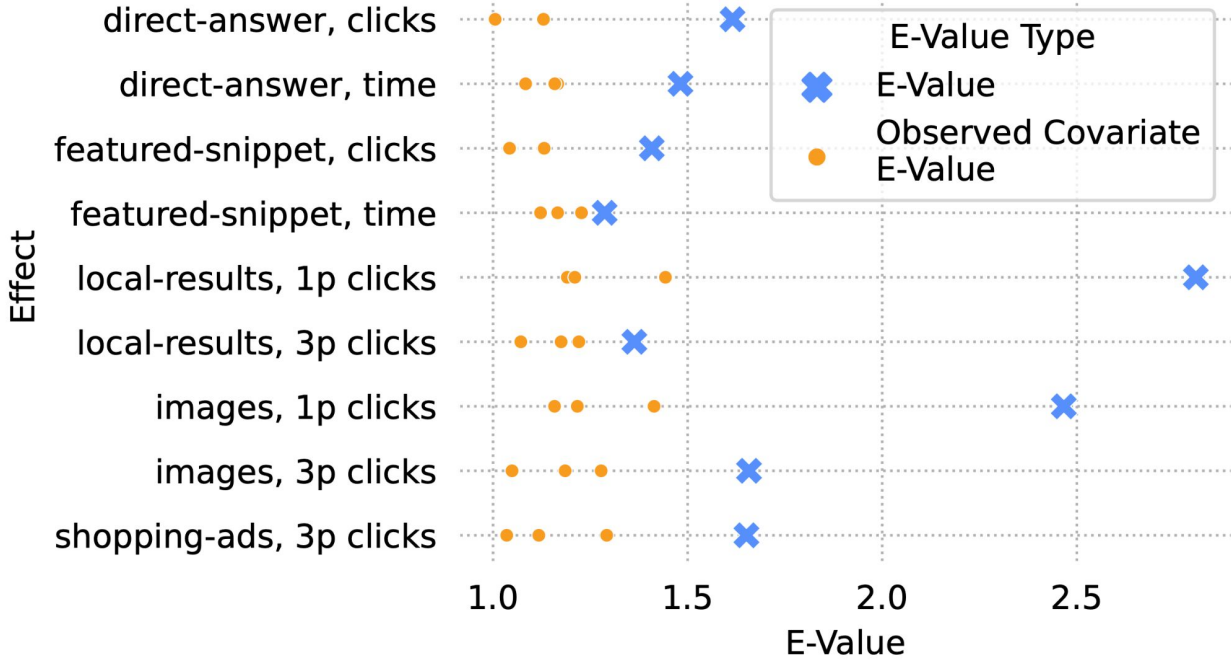
Method: Matching Evaluation

	Component	Mean Cosine Similarity	Matches Retained
Extracted Results	featured-snippet	0.92	3330 (.04)
	knowledge-panel	0.92	1557 (.03)
	top-stories	0.94	1057 (.06)
	top-image-carousel	0.96	915 (.09)
	direct-answer	0.92	345 (.01)
Google Services	ad	0.95	2223 (.06)
	shopping-ads	0.93	1090 (.03)
	local-results	0.90	306 (.05)
	videos	0.93	300 (.02)
	images	0.91	170 (.02)
	map-results	0.90	127 (.03)
	scholarly-articles	0.91	126 (.05)

Method: Additional Confounders



Results: Sensitivity Analysis



Demographic Variable		Frequency
Age	18 - 24	13.6
	25 - 44	42.2
	45 - 64	30.3
	65+	13.9
Gender	Male	51.5
	Female	48.5
Race/Ethnicity	White	74.1
	Black	8.4
	Asian	6.8
	Latino	6.8
Education	Four-year degree or higher	54.6
	Less than a four-year degree	45.4
Income	Under \$50,000	47.3
	\$50,000 - \$99,999	30.9
	\$100,000 - \$149,999	12.5
	\$150,000 - \$199,999	4.8
	\$200,000 and over	4.4
Political Party	Democrat	54.8
	Independent/Other	30.8
	Republican	14.4

Table 1: Participant Demographics