

Targeted and Troublesome: Tracking and Advertising on Children's Websites

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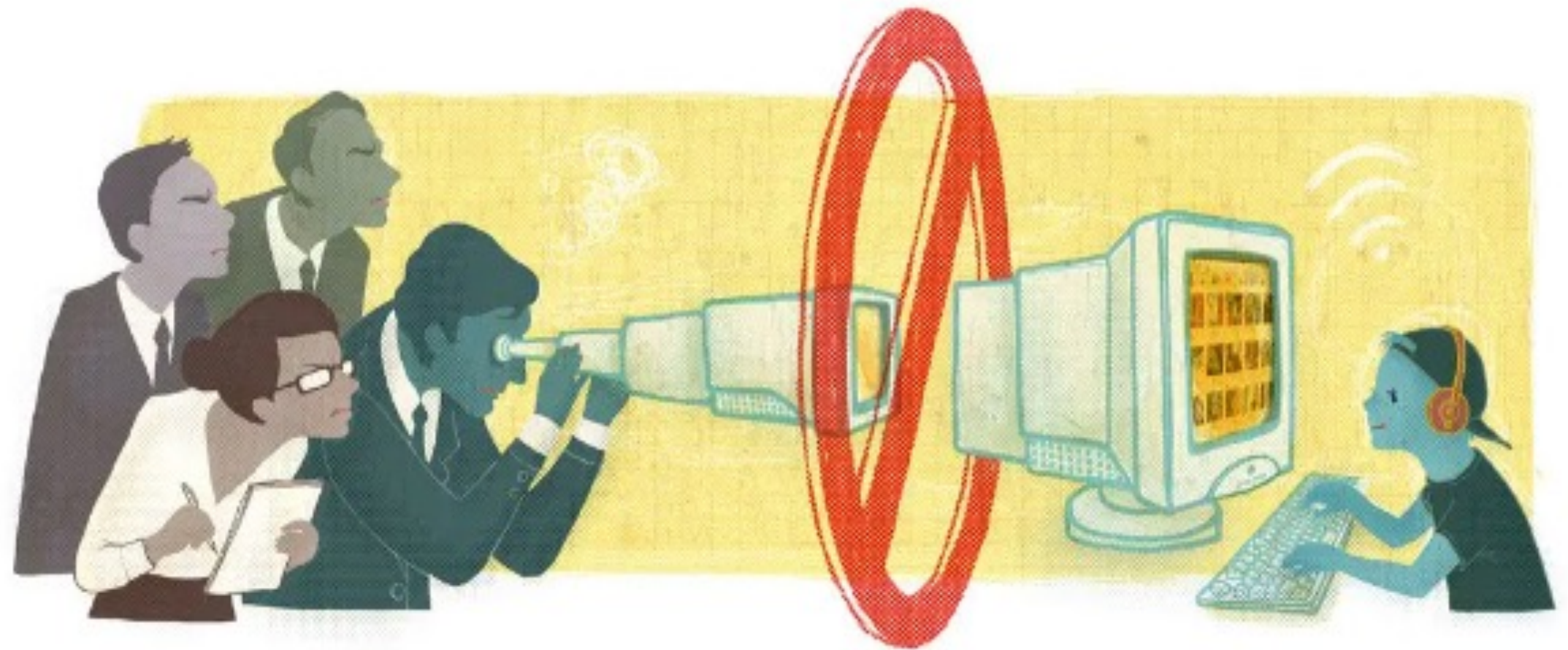
May 2024

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Motivations

- Online tracking
- Behavioural profiling
- Advertisements



Online advertising

BLEEPINGCOMPUTER

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in

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Search Site

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Home > News > Security > Hackers push malware via Google search ads for VLC, 7-Zip, CCleaner

Hackers push malware via Google search ads for VLC, 7-Zip, CCleaner

By **Ionut Ilascu**

January 17, 202306:09 PM7

YouTube ads are the latest ground zero for nefarious crypto mining

Cryptojackers figured out how to turn Google's DoubleClick ad service into a platform for secret cryptocurrency mining.

By [Adam Rosenberg](#) on January 27, 2018





Celebrities Who Refuse to Admit They Aren't Famous Anymore
Upbeat News



New Cash Law Coming Before Election?
Better Living Digest



Drone Captures Photos No One Was Supposed to See
Upbeat News



Free Driver Update
WinZip Driver Updater
For Windows 10, 8, 7, XP, Vista
Update your drivers in less than 2 minutes. (Guaranteed) Update now - Fast and free.
Start my update

163 Votes

Is the FDA hiding the secret treatment that saved Ronald Reagan from cancer?

Yes

No

Not sure



One Simple Hack Keeps Your Blood Sugar Below 100
Blood Sugar Formula | Sponsored

Bad Ads: Problematic Content in Online Advertising

A research project of the [Security and Privacy Lab](#) at the [Paul G. Allen School of Computer Science & Engineering](#) at the University of Washington

Overview


Research

Datasets

People

New! Read about our IMC '21 paper on political ads during the 2020 U.S. Elections here: [Polls, Clickbait, and Commemorative \\$2 Bills: Problematic Political Advertising on News and Media Websites Around the 2020 U.S. Elections](#)


Online advertising for children

 **AMERICAN PSYCHOLOGICAL ASSOCIATION**

TOPICS PUBLICATIONS & DATABASES RESEARCH & PRACTICE EDUCATION & CAREER

Home > Psychology topics > Obesity >

The impact of food advertising on childhood obesity



Obesity Marketing and Advertising Children

‘Sneaky’ social media ads are luring young into gambling, say campaigners

Call for stricter rules for betting firms to stop use of promotions with references to popular culture that appeal to under-18s



Research found children were less able than adults to recognise the posts as promotions.
Photograph: Justin Lambert/Getty Images

Ad categories restricted by Google

Adult and Sexually Suggestive Content: Sexual and mature content that is intended for adult audiences and not suitable for users under the age of 13.

Age Sensitive Media Content: Media that is sensitive to show to users under the age of 13. This includes movies and TV shows with ratings greater than G and PG. This also includes offers promoting fictional material, including books or comics, that fall in the Romance genre.

Alcohol / Tobacco / Recreational Drugs: Products such as alcohol, tobacco, and recreational drugs that are regulated or illegal to advertise to children. This also includes [Prohibited Content](#) and [Restricted Content](#). In addition, products that are strongly related to alcohol, tobacco or recreational drugs are also prohibited (for example, offers for vineyard tours, e-cigarettes or drug paraphernalia).

Astrology / Occult / Paranormal: Advertisements for content relating to astrology, the occult or the paranormal.

Beauty and Cosmetics: Cosmetics and other products related to external personal care focused on body image. Also included are advertisements related to cosmetic procedures or surgeries, tanning, tattoos, or piercings.

Contests and Sweepstakes: Contests or sweepstakes promotions, even if free to enter.

Dangerous Content: Content that is dangerous and inappropriate for users under the age of 13

Source: <https://support.google.com/adspolicy/answer/9683742?hl=en>

Regulations on advertising directed at children

- DSA prohibits targeting children with ads based on profiling
 - What's the state of *targeted/personalized ads shown to children* now?
- There have been calls to update the Children's Online Privacy Protection Act (COPPA) in the US.

Study objectives

- Identifying:
 - Third-party trackers
 - Fingerprinting attempts
 - Advertisements, including **targeted** and **improper** ads
 - Dating, mental health, weight loss, racy

Challenges

- Building a list of children's websites
- Automating detection of ads and targeted ads
- Scraping ads and ad disclosure

page (why this ad?)

Why this ad?

This ad is based on:

- The time of day or your general location (like your country or city)
- Websites you've visited
- Your visit to the advertiser's website or app

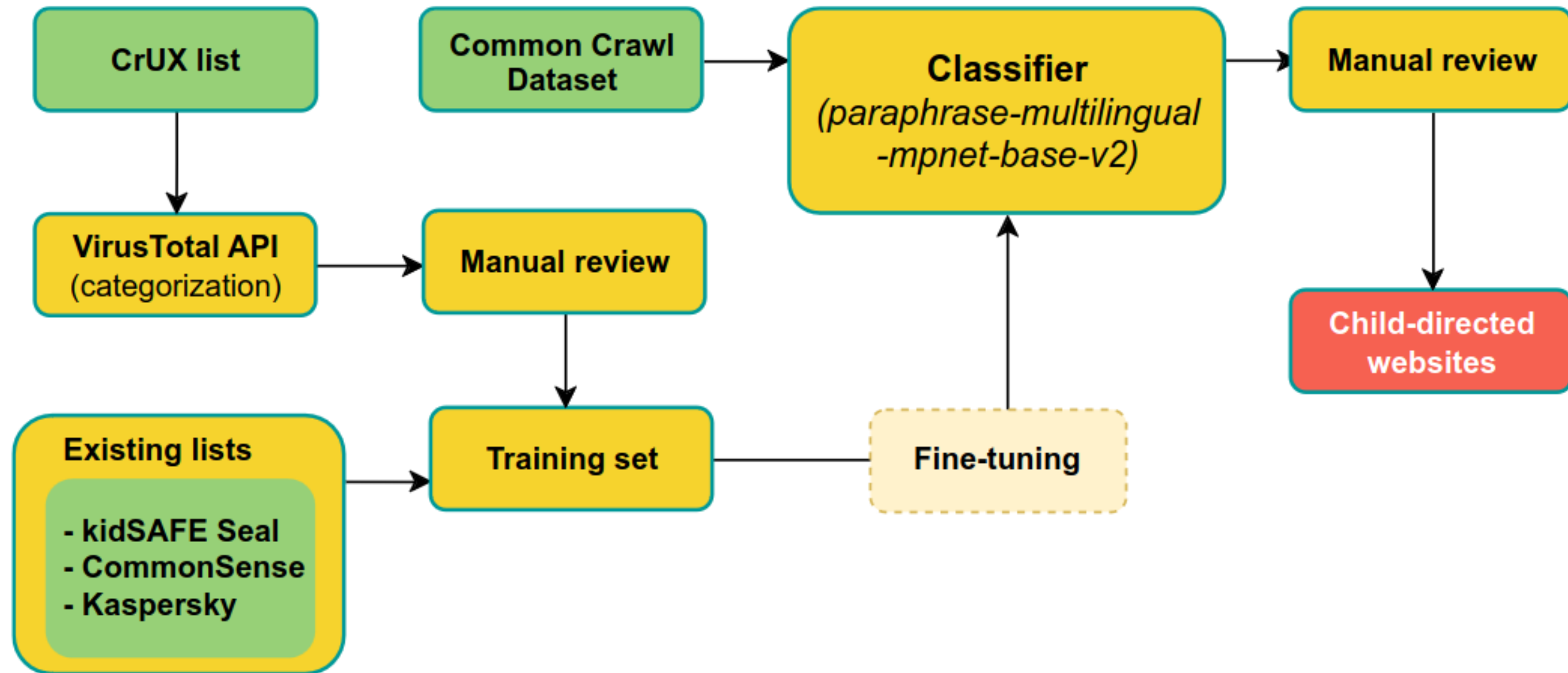


Stop seeing this ad

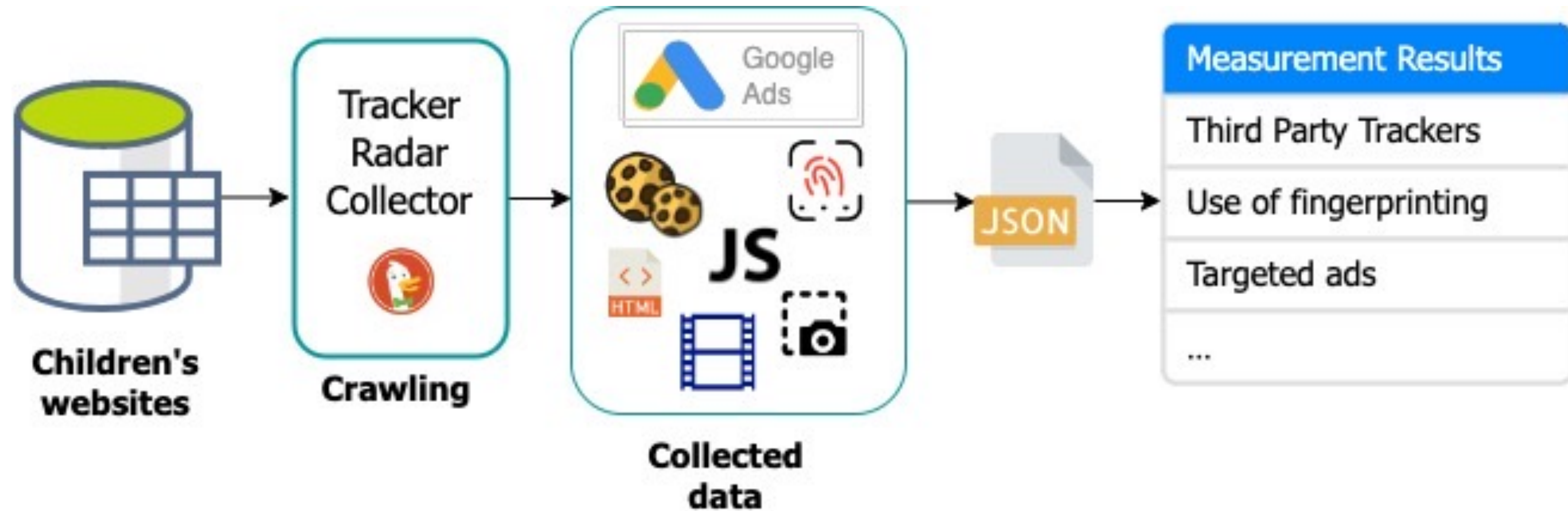


Report this ad

Pipeline for building a list of children's websites



Crawling process



Ad collector crawler - Targeted ad detection



Why this ad?

This ad is based on:

- The information on the website you were viewing
- Google's estimation of your interests, based on your activity on Google on this device

 Report this ad

(a) Targeted ad

Why this ad?

Ad personalization is off. Google showed this ad based on general factors like:

- The time of day
- The website you're on
- Your general location (like your country or city)

 Report this ad

(b) Non-targeted ad

Crawl statistics

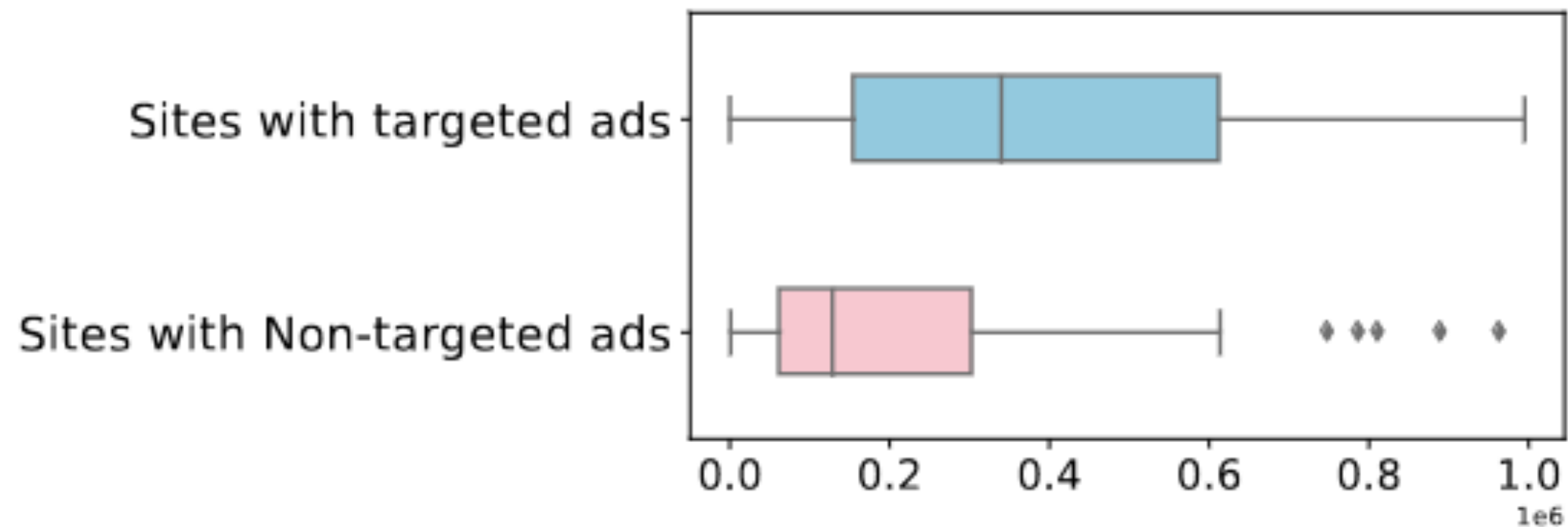
TABLE 1: Crawl statistics based on different vantage points.

Form factor	Vantage point	Successfully loaded pages	Successful crawling rate
Desk.	NYC	10,310	95%
	SF	10,301	95%
	LON	10,270	95%
	FRA	10,221	95%
	AMS	10,014	93%
Mobile	NYC	10,168	94%
	FRA	10,283	96%
Sum/Avg.		71,567	95%

Results - Overview

- Scraped **70,303 ads** from 804 of the 2,004 distinct websites
- On avg. **36%** of the pages contained one or more **ads**
- On avg. **27%** of the pages contained **targeted ads**
- Over **70% of ads are targeted** in nature (targeting enabled)
- Detected **malicious ad links**

Popularity of sites with and without targeted ads



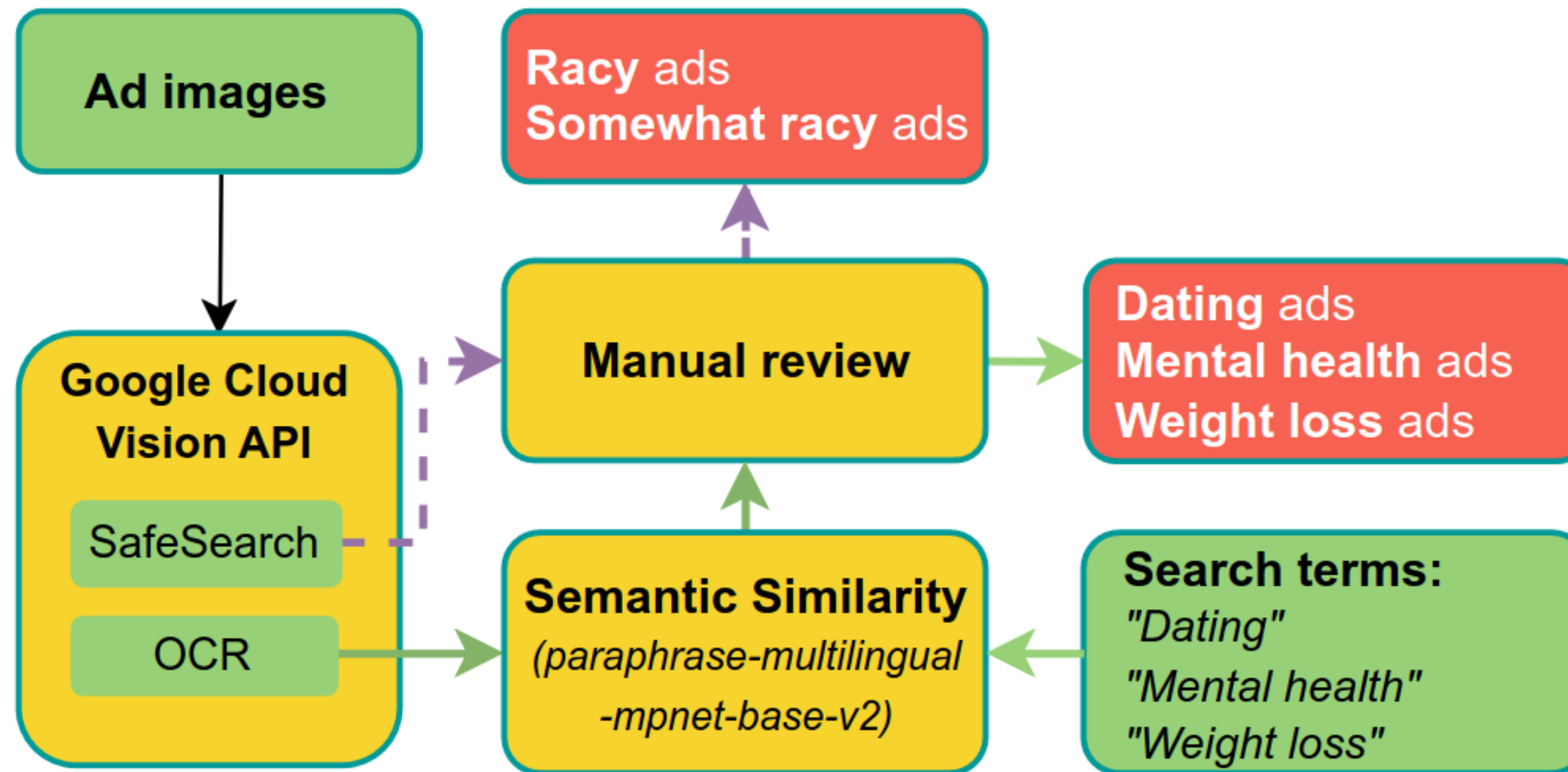
- Popular websites more likely to disable ad-targeting
- X-axis: Tranco (popularity) rank

Advertiser locations

TABLE 3: Top ten advertisers by the number of ads across all crawls.

Advertiser	Location	# ads	% targeted	Type of ads
Vinden.nl B.V.	Netherlands	4,707	86%	Search results
EXPLORADS	Cyprus	3,265	73%	Search results
All Response	UK	2,453	68%	Search results
Gloworld LLC	USA	2,365	55%	Online learning
Amomama M.	Cyprus	921	72%	Workout muscle gain, weight loss
Media Quest	UAE	910	79%	Search results
Brain Metrics I.	Cyprus	814	50%	IQ tests
BetterMe	Cyprus	731	85%	Weight loss
Marketism	Israel	645	49%	Search results
Alibaba.com HK	Hong Kong	541	86%	Products sold on Alibaba.com

Improper ad detection ML pipeline



Improper ads on children's websites

TABLE 4: Number of improper ads identified for each crawl.

Form factor	Vantage point	Dating	Mental health	Weight loss	Racy	Some-what racy	Total
Desk.	NYC	4	21	16	21	26	88
	SF	7	9	15	6	25	62
	LON	10	17	48	12	31	118
	FRA	1	0	48	19	25	93
	AMS	8	4	82	10	33	137
Mobile	NYC	22	25	113	98	17	275
	FRA	18	5	190	11	6	230
Total		70	81	512	177	163	1003

NSFW!

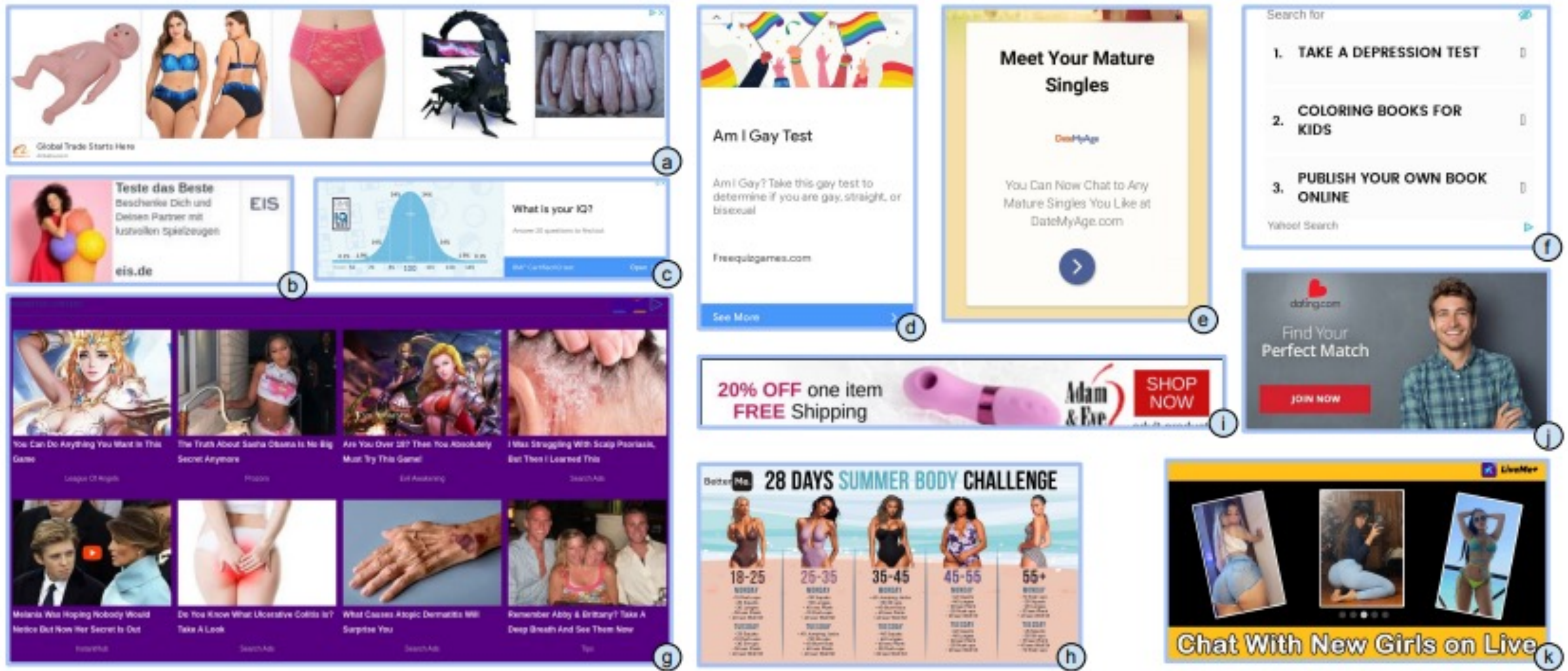


Figure 1: A sample of improper ads found on child-directed websites in our crawls.



New York vanaf 411 €*
 Volg het geldende reisadvies.

Boek nu

Lufthansa

*Retour, vanaf-prijzen, inclusief belastingen en toeslagen. Afhankelijk van beschikbaarheid en voorwaarden.

Click to go back, hold to see history

HOME | SHOP |

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TEACHER RESOURCES ▾

PRINTABLES ▾

HOLIDAYS & SEASONS ▾

FIND BY AGE ▾

NEWS

This FREE set of fall dot marker coloring pages makes a perfect hassle free, mess free activity ...
[Read more](#)

Share This +
   

Kids can make this fun finger paint football craft this fall with paper and paint. [Read more](#)

Share This +
   

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Boek nu

Lufthansa

Fall Cut And Paste Activity Pages



Printable set of 10 FREE fall cut and paste activity pages includes matching and sorting ... [Read more](#)

Share This +
   

Q-Tip Painting Art Project



Paint fun flowers with this q-tip painting art project tutorial for kids. [Read more](#)

Share This +
   

Fall Find The Difference Activities



Set of 9 printable fall find the difference activities to immerse children ages 4-8 in fun ... [Read more](#)

Share This +
   

Paper Tube Horse Craft

Back To School I Spy Games For



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Flirtfinder™

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- [Topic 5 Classify and Count Data](#)
- [Topic 6 Understand Addition](#)
- [Topic 7 Understand Subtraction](#)
- [Topic 8 More Addition and Subtraction](#)
- [Topic 9 Count Numbers to 20](#)
- [Topic 10 Compose and Decompose Numbers 11 to 19](#)
- [Topic 11 Count Numbers to 100](#)
- [Topic 12 Identify and Describe Shapes](#)
- [Topic 13 Analyze, Compare, and Create Shapes](#)
- [Topic 14 Describe and Compare Measurable Attributes](#)

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Am I Gay Test

See More



parts are learned, these parts will be useful in understanding other medical words. This system is called word building. Since it is not practical to walk around with a medical dictionary, this system will help the student to learn words that are related to diagnosis and conditions, procedures and tests.

To analyze medical words, we need to understand 4 elements that are used to form the words. These elements are:

- Word root
- Combining form
- Suffix
- Prefix

To better understand the formation of the words, identifying marks will be used to separate the different elements.

Slash (/) — to separate word elements: gastr/o

[Reload](#) [Open](#) [Download](#)

MEN'S DRIVING FORCE

AdChoices 

Forget The Blue Pill
Try This & She Will Be Intrigued

[WATCH NOW](#)

**Men, You Don't Need
The Blue Pill If You Do
This Once A Day**

 **WATCH**

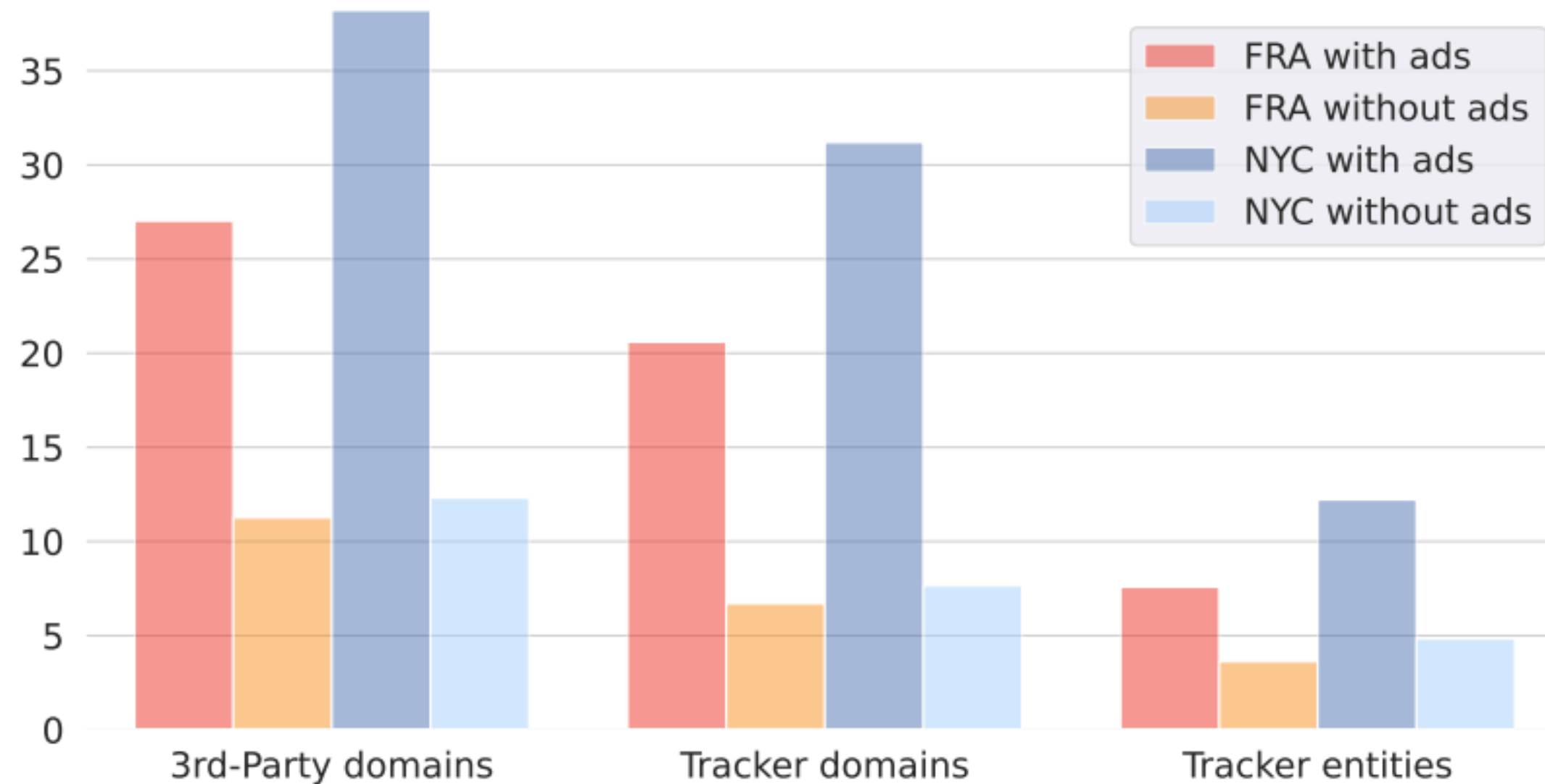
8. Preteach Academic Vocabulary And Concepts (Prefixes)



Websites with the most distinct tracker entities

Loc.	Website	# Trackers	# Requests	# Cookies	Rank
NYC	mathfunworksheets.com	161	1,547	395	669K
	woojr.com	148	2,181	391	83K
	innerchildfun.com	139	1,235	336	308K
	kidzfeed.com	138	1,050	272	797K
	thecolor.com	138	1,068	260	192K
FRA	www.wowescape.com	95	392	55	258K
	webgames.io	94	564	92	155K
	coloriages-pour-enfants.net	90	401	66	919K
	theschoolrun.com	87	417	91	760K
	testsworld.net	86	478	138	-

Trackers on websites with ads vs. without ads



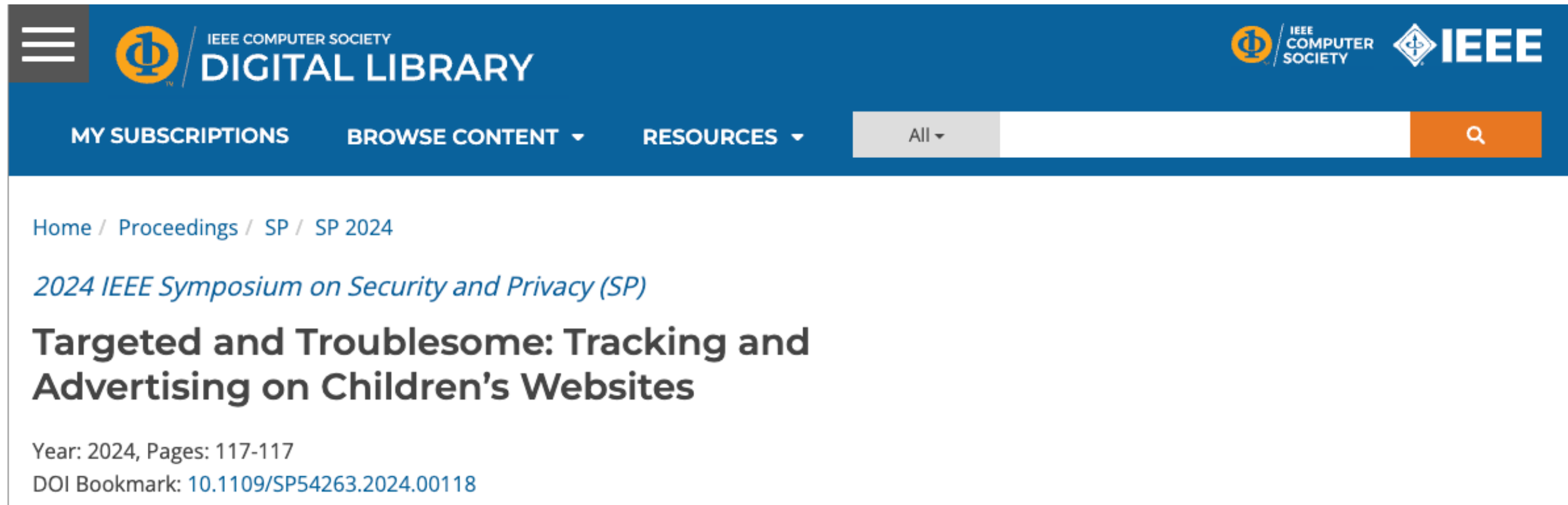
Reachout

- Contacted 5 ad companies that showed racy ads
- Reported racy ads to Google
- Shared our results with:
 - European data protection agency and a consumer protection agency
 - 5Rights Foundation

Summary

- Trackers on **90%** of children's websites.
- Ads on **36%** of children's websites.
- Targeted ads on **27%** of children's websites.
- Hundreds of improper ads
 - Racy ads
 - Mental health
 - Dating
 - Weight loss

Any questions?



The screenshot shows the IEEE Digital Library interface. The top navigation bar includes a hamburger menu, the IEEE Computer Society Digital Library logo, and the IEEE logo. Below the navigation bar, there are links for 'MY SUBSCRIPTIONS', 'BROWSE CONTENT', and 'RESOURCES'. A search bar is also present. The main content area displays the breadcrumb 'Home / Proceedings / SP / SP 2024', the title '2024 IEEE Symposium on Security and Privacy (SP)', and the paper title 'Targeted and Troublesome: Tracking and Advertising on Children's Websites'. Below the title, it shows 'Year: 2024, Pages: 117-117' and 'DOI Bookmark: 10.1109/SP54263.2024.00118'.

Contact us: zahra.moti@ru.nl

Project repository: <https://github.com/targeted-and-troublesome/targeted-and-troublesome-crawler>