

3 - Digital trace data

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MAX-PLANCK-INSTITUT
FÜR DEMOGRAFISCHE
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RESEARCH

Agenda

1. Q&A
2. Introduction to digital trace and marketing data
3. Example 1: Migration
4. Example 2: Internet users
5. Discussion

Q&A

- ▶ Questions about on Exercise 1 from the final assignement
- ▶ Issues with Familinx data
- ▶ Other?

Digital traces are incidental to our online presence

- ▶ Digital breadcrumbs are unavoidable
- ▶ Pre-GDPR, largely unchecked
- ▶ Marketing-led
- ▶ Not collected for social-scientific research

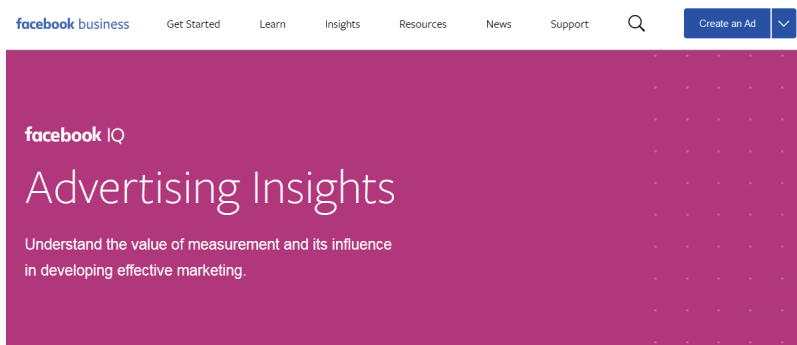
Some data sources



- ▶ Marketing platforms
 - ▶ Facebook/Instagram/WhatsApp API
 - ▶ LinkedIn API
- ▶ Online platforms and communication
 - ▶ Twitter (API)
 - ▶ Google Trends
 - ▶ Email, IP address, mobile phones
- ▶ Internet of Things
 - ▶ Activity trackers and wearables medical devices
 - ▶ Wearable sensors (see Cito Cattuto)

Facebook marketing platforms and APIs

- ▶ Sofia Gil's tutorial:
https://github.com/SofiaG1l/Using_Facebook_API
- ▶ For python users, Carol Coimbra's:
<https://github.com/carolcoimbra/facebook-ads>

Using online marketing tools for demographic research

A screenshot of the Facebook Business Advertising Insights page. The top navigation bar includes the 'facebook business' logo, links for 'Get Started', 'Learn', 'Insights', 'Resources', 'News', and 'Support', a search icon, and a 'Create an Ad' button with a dropdown arrow. The main content area has a purple background with a grid of small white dots on the right. The text 'facebook IQ' is in the top left, followed by 'Advertising Insights' in large white font. Below this, a subtitle reads: 'Understand the value of measurement and its influence in developing effective marketing.'

facebook business Get Started Learn Insights Resources News Support  [Create an Ad](#) 

facebook IQ

Advertising Insights

Understand the value of measurement and its influence in developing effective marketing.

'Audience estimates': FB users in Guatemala

Diego Alburez (371284279)

Campaign

Objective

Ad account

Create new

Ad set

Page

Audience

Placements

Budget & schedule

Ad

Identity

Format

Media

Text

Close

Ad set name

18+

Locations

Guatemala


Guatemala City, Guatemala Department

+ 40 km

Include

Type to add more locations

Browse



Drop Pin

Add locations in bulk

Age

18

-

65+

Gender

All

Men

Women

Languages

Enter a language...


Include people who match

Behaviours > Mobile Device User

Estimate doesn't include Facebook Stories

Because Facebook Stories is a new placement being released gradually, audience and reach estimates aren't currently available. These estimates are based on the other placements that you've selected.

Audience size




Your audience is defined.

Potential reach: 3,700,000 people

Estimated daily results

Reach

7.5K-22K



The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't

8 / 22

Male FB users, aged 18+ in Guatemala City

Diego Alburez (371284279)

Campaign

Objective

Ad account

Create new

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Budget & schedule

Ad

Identity

Format

Media

Text

Close

Ad set name

18+

Switch to Quick Creation

Guatemala

Guatemala City, Guatemala Department

+ 40 km

Include

Type to add more locations

Browse

Locations

Guatemala City, Guatemala Department

Tapachula

Quetzaltenango (Xela)

Guatemala City

Escuintla

Antigua Guatemala

Cobán

Zacapa

Chiquir

Jutiap

Atiquizaya

Acajutla

Drop Pin

Add locations in bulk

Age

18

65+

Gender

All

Men

Women

Languages

Enter a language...

Include people who match

Behaviours > Mobile Device User

Estimate doesn't include Facebook Stories

Because Facebook Stories is a new placement being released gradually, audience and reach estimates aren't currently available. These estimates are based on the other placements that you've selected.

Audience size

Your audience is defined.

Potential reach: 2,000,000 people

Estimated daily results

Reach

6.4K-27K

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't

Female FB users, aged 18+ in Guatemala City

Facebook Ads Manager

Search []

Diego ▾ | Notifications | Settings | ?

Account: Diego Alburez (371284279) ▾

Ad set name: 18+ [Settings] [Switch to Quick Creation]

Campaign ✓
Objective: []

Ad account ✓
Create new []

Ad set []
Page []
Audience []
Placements []
Budget & schedule []

Ad []
Identity []
Format []
Media []
Text []

Locations ⓘ

Guatemala
Guatemala City, Guatemala Department
+ 40 km ▾

[Include] ▾ | Type to add more locations | Browse

Drop Pin

Add locations in bulk

Age ⓘ 18 ▾ - 65+ ▾

Gender ⓘ All Men Women

Languages ⓘ Enter a language...

Estimate doesn't include Facebook Stories

Because Facebook Stories is a new placement being released gradually, audience and reach estimates aren't currently available. These estimates are based on the other placements that you've selected.

Audience size

Your audience is defined.

Potential reach: 1,700,000 people ⓘ

Estimated daily results

Reach ⓘ
8.1K-20K

The accuracy of estimates is based on factors such as past campaign data, the budget you've entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

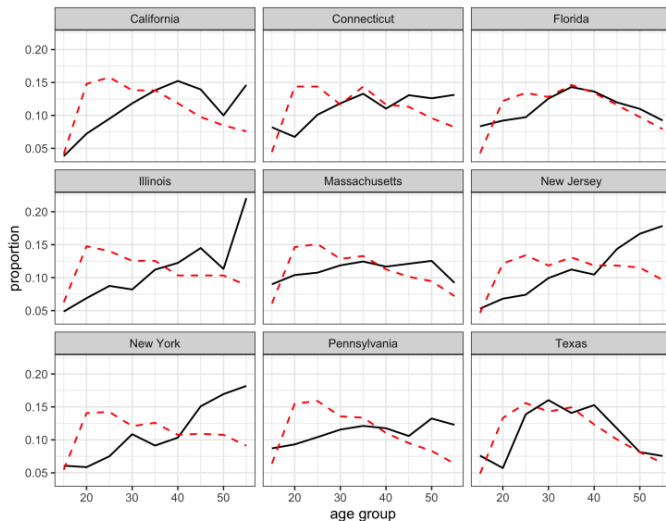
Example 1: Migration

Research at a glance

- ▶ RQ: Estimate out-migration from Puerto Rico in the months after 2017 Hurricane Maria
- ▶ Data: FB advertising platform and American Community Survey (ACS)
- ▶ Findings: Flows by age, sex, and US State

Alexander, M., Polimis, K. and Zagheni, E. (2019), The Impact of Hurricane Maria on Out-migration from Puerto Rico: Evidence from Facebook Data. *Population and Development Review*, 45: 617-630.

Sanity checks



Alexander, M., Polimis, K. and Zagheni, E. (2019), The Impact of Hurricane Maria on Out-migration from Puerto Rico: Evidence from Facebook Data. *Population and Development Review*, 45: 617-630.

Population increase

Table 2: Estimated increase in Puerto Rican migrant stocks from October 2017 to January 2018. The 95% confidence intervals are shown in parentheses.

State (95% CI)	% Increase (95% CI)	Population Increase
Florida	21.6 (20.9, 22.3)	65433 (63342, 67525)
New York	11 (10.3, 11.7)	14477 (13584, 15371)
Pennsylvania	13.4 (12.7, 14.1)	13441 (12700, 14181)
Connecticut	14.7 (12.9, 16.5)	9402 (8244, 10560)
Massachusetts	10.1 (8.82, 11.4)	8957 (7824, 10090)
Texas	10.8 (10.4, 11.2)	5678 (5452, 5904)
Ohio	12.8 (12.2, 13.4)	3274 (3125, 3424)
Illinois	9.9 (9.15, 10.6)	2641 (2441, 2841)
Georgia	13.1 (12.4, 13.8)	2606 (2470, 2742)
New Jersey	2.9 (1.56, 4.24)	2282 (1228, 3336)
California	2.4 (1.86, 2.94)	573 (444, 702)

Alexander, M., Polimis, K. and Zagheni, E. (2019), The Impact of Hurricane Maria on Out-migration from Puerto Rico: Evidence from Facebook Data. *Population and Development Review*, 45: 617-630.

Percent change by age groups

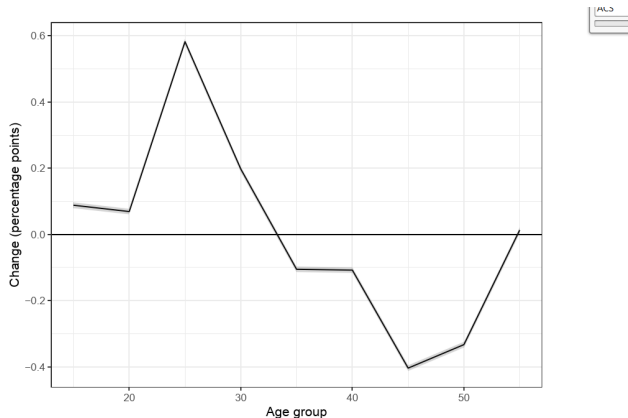


Figure 3: Estimated change in Puerto Rican migrant age distribution from October 2017 to January 2018.

Alexander, M., Polimis, K. and Zagheni, E. (2019), The Impact of Hurricane Maria on Out-migration from Puerto Rico: Evidence from Facebook Data. *Population and Development Review*, 45: 617-630.

Example 2: Digital use

Summary

- ▶ RQ: Predict internet and mobile phone use gender gaps
- ▶ Data: FB advertising platform and indicators from offline sources
- ▶ Estimating rates: Facebook Gender Gap Index:

$$\frac{\text{Female to male gender ratio of people with characteristic}}{\text{Female to Male gender ratio of the population}}$$

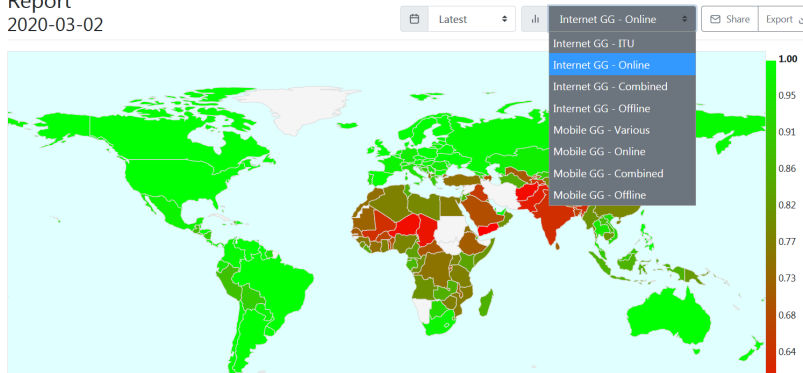
- ▶ Findings:
 - ▶ Facebook-based measure performed well compared to ground truth
 - ▶ Online+offline measure: best estimates

Fatehkia, M., Kashyap, R., and Weber, I. (2018). Using Facebook ad data to track the global digital gender gap. *World Development* 107:189–209.

Measuring the gender gap in real-time

Report

2020-03-02



<https://www.digitalgendergaps.org/data/?report=2020-03-02>

Discussion

Strengths and weaknesses of digital trace data

- ▶ Puerto Rico migration
 - ▶ Pro: Real-time data
 - ▶ Con: No 'ground-truth' data (?)
 - ▶ Con: Non-representative sample based on unknown algorithms
 - ▶ Pro: Difference-in-difference to adjust for bias
- ▶ Digital gender gap
 - ▶ Pro: Nowcasting (<https://www.digitalgendergaps.org/data/?report=2020-03-02>)
 - ▶ Pro: Ideal data for the job?
 - ▶ Pro: 'Ground-truth' data: Internet Gender Gap Index
 - ▶ Con: Rates are unadjusted - what is the data representative of?

Challenges going ahead

Whoever you are. . . I've always depended on the kindness of strangers.

— Blanche DuBois, *A Streetcar Named Desire*

1. Ensuring sustainable data access
2. Addressing systematic bias
3. No information information about algorithms that companies use internally (eg. rounding errors)
4. Privacy and ethical digital research

Zuboff, S. (2015). Big other: Surveillance capitalism and the prospects of an information civilization. *Journal of Information Technology* 30(1):75–89.

Homework

- ▶ Start with Exercise 2
- ▶ Think for tomorrow: How does this relate to your interests (if at all)?