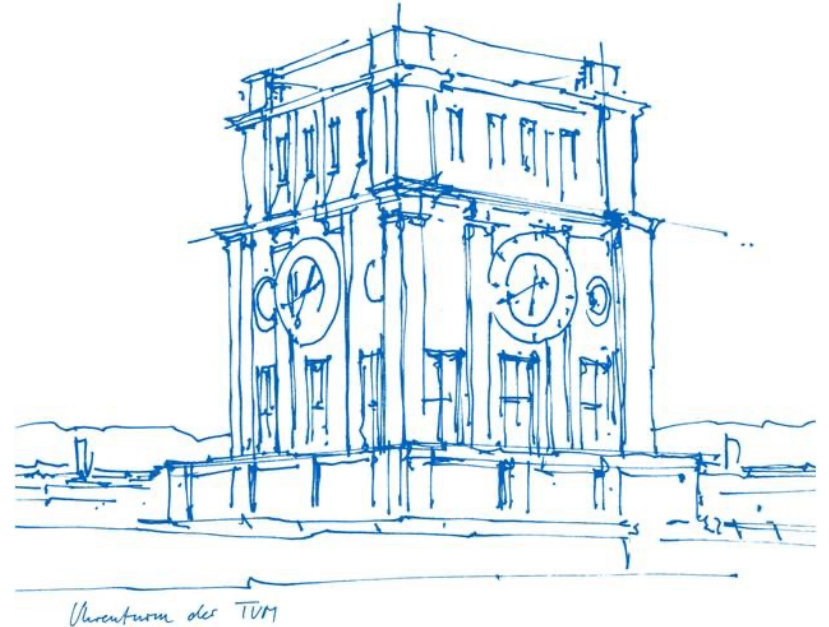


Observing natural experiments: lessons learnt from the 9-Euro-Ticket in Germany

Allister Loder

London, 16 October 2023



Observing natural experiments

- Public transport strikes, road closures,
- In research, such events are used, e.g., to empirically assess the benefits of public transport, e.g., Adler and van Ommeren (2016)
- Often, such analyses use **aggregated** data such as counts, speeds

In 2022, Germany experienced a triple natural experiment in response to the cost-of-living crises

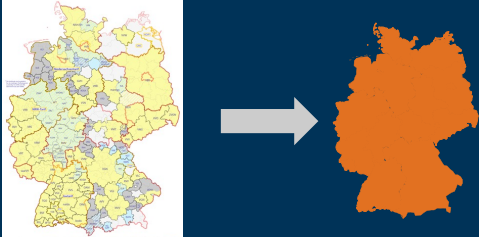
Fuel tax cut

0.3€/l gasoline and
0.15€/l diesel

→

0€/l

70 transit districts
become one



Quasi-fare-free
public transport

~55€/month
and district

→

9€/month
entire nation

The 9-Euro-Ticket



Hypotheses



The changes in travel costs of car and public transport relatively to each other are expected to change travelers' mode choice



The substantial reduction in travel costs across transit district borders increases travel by public transport across these



The reduction in car traffic and public transport costs is further expected to increase overall individual mobility

German public transport in intl. media, not the Swiss!

The New York Times

Germany's €9 Monthly Train Pass Has Proved Popular (and a Pleasant Surprise)

To help offset inflation, Germany's government has subsidized cheap train passes this summer. While many feared chaos and overcrowding on an overburdened system, it has been a relatively smooth ride.

<https://www.nytimes.com/2022/08/15/world/europe/germanys-trains-9euro-pass.html>

Way to go: why Germany's €9 travel pass is a big step in the right direction

Melissa Bruntlett and Chris Bruntlett

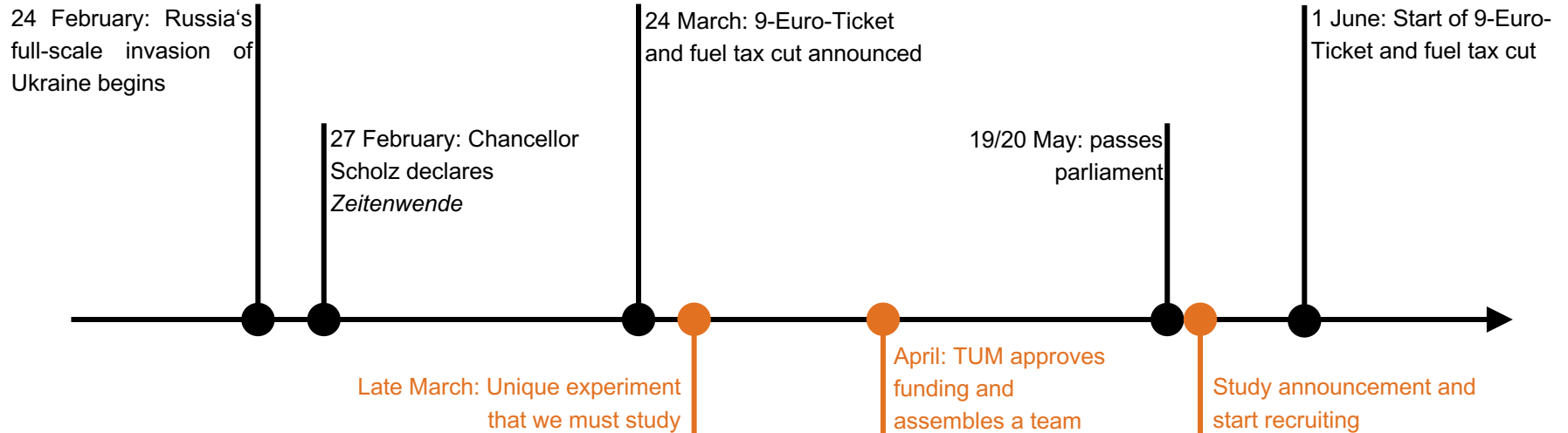


Cheap fares alone are not enough. Dutch-style investment, together with price cuts, could be the real game changer



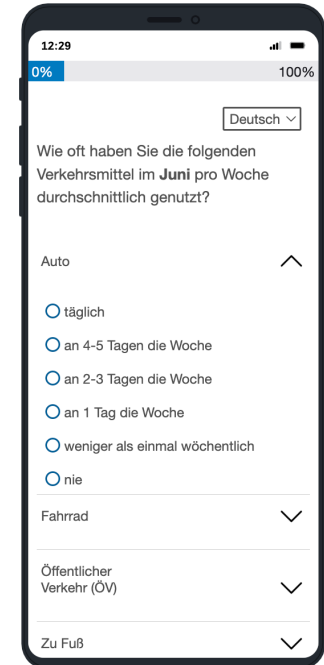
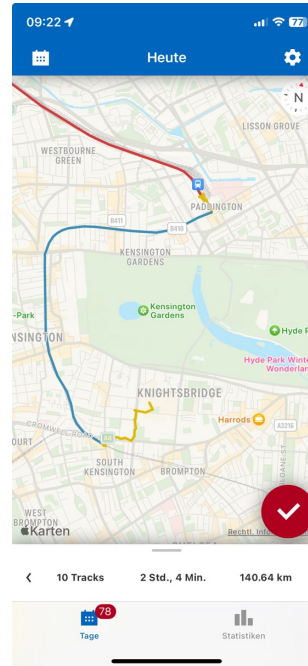
<https://www.theguardian.com/world/2022/jul/14/germany-9-euro-travel-pass-cheap-fares>

Decision to study these experiments

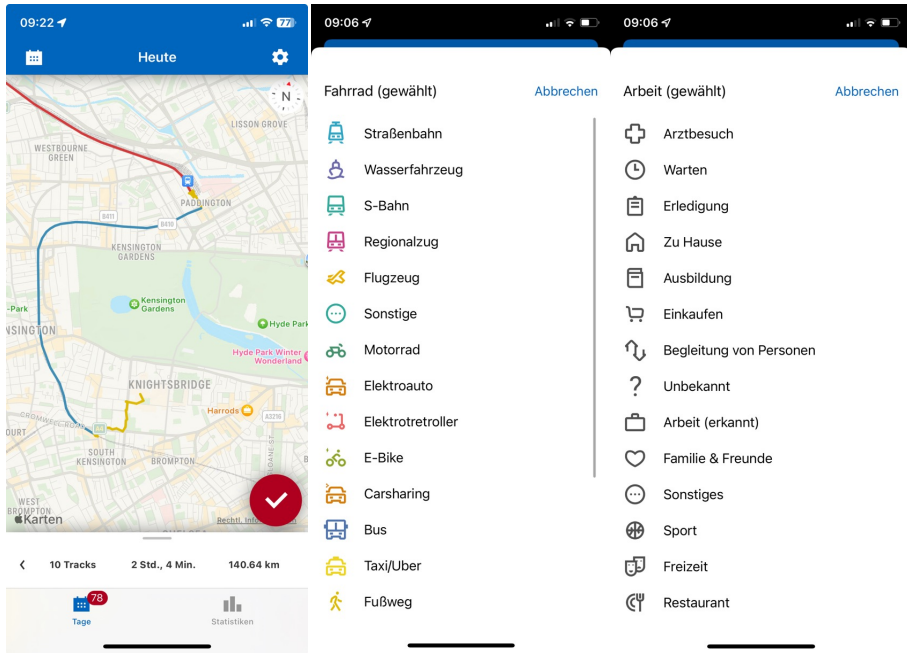


The Mobilität.Leben study

- Panel from May to September 2022
- App for semi-passive travel diary generation and household surveys
- All digital for quick and scalable distribution
- Similar designs
 - MOBIS/COVID (ETHZ 2019-2022)
 - Tsoleridis, Choudhury and Hess (2022)



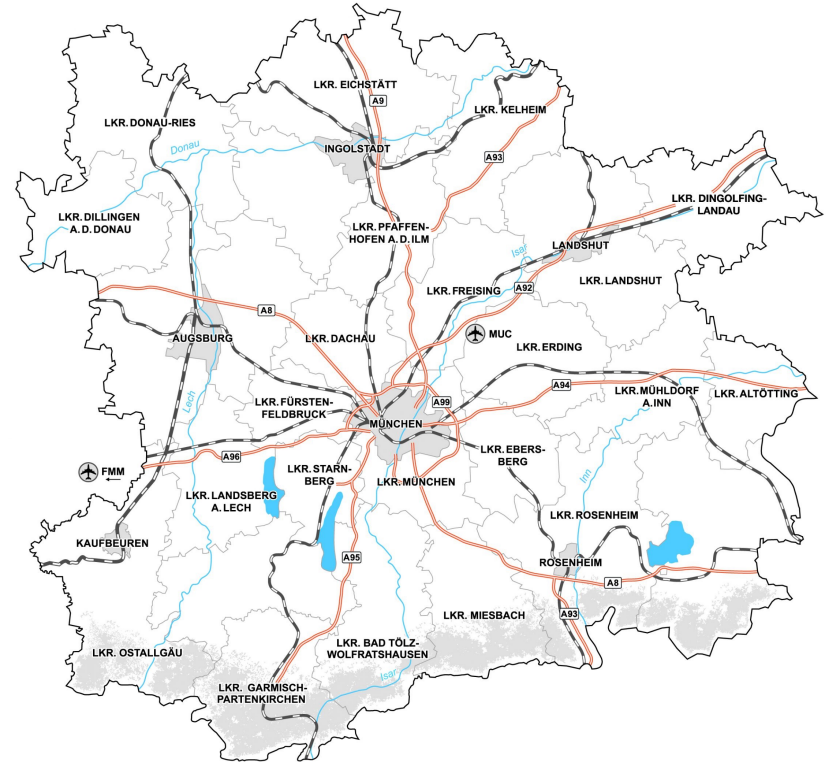
Mobilität.Leben-App: Little to no user input



- MotionTag, Berlin-based startup
- 15-20min processing time

Recruiting

- Media campaign in focus area Munich; nation-wide online panel (as backup, survey only)
- In total, 2,200 participants of which
 - ~ 1,000 for app+survey
 - ~ 1,200 for survey only
- 1,200 completed the survey, 650 survey+app



Many observed the experiment

App+Survey

- Mobilität.Leben (panel: initial N=2000, N=1,400 survey only, N=650 for app+survey with at least 2 weeks tracking per month)
- DIW / Intervista (panel: initial N=4,800, N=1200 for survey, N=850 for app+survey with at 2 weeks of tracking)

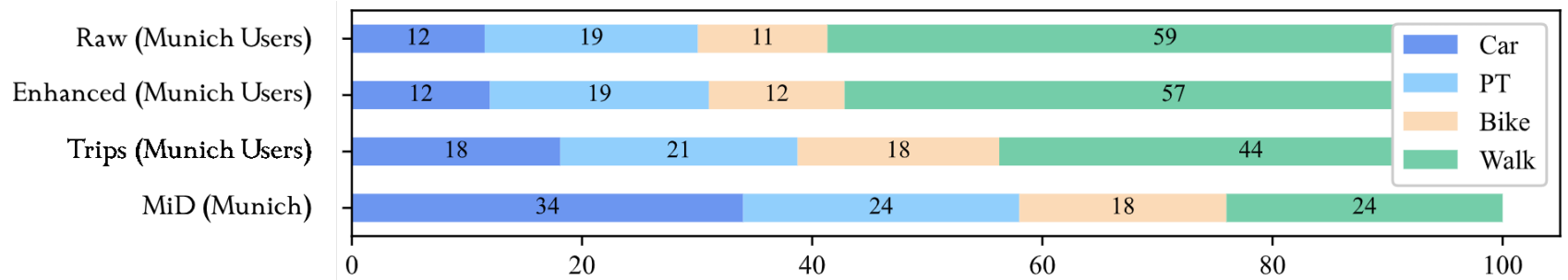
Survey only

- VDV-study ("Main study") on market research (cross-sectional/pseudo-panel, N= 100,000)
- Further university studies, e.g., Kassel, TU Dresden, UniBW (smaller, local, some were panel)
- Further consultancy studies, e.g., OpinionTRAIN (cross-sectional, N=2400)

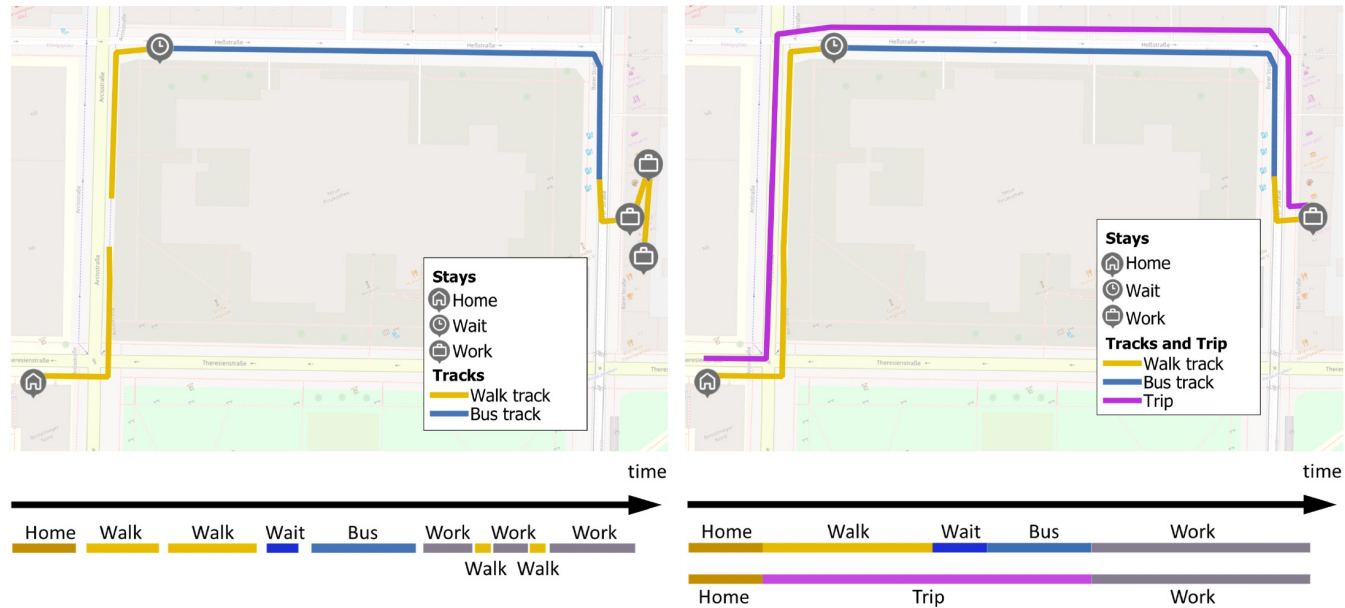
Other

- Federal office of statistics / federal government: mobile phone data

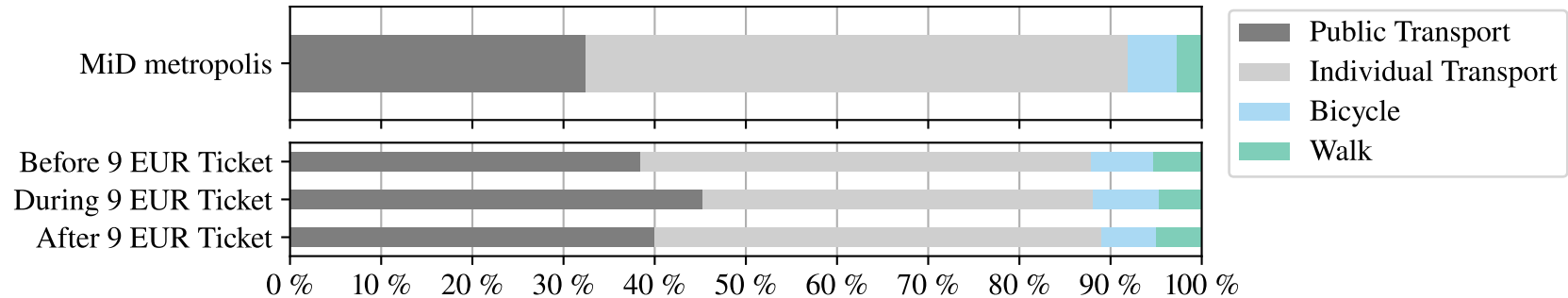
Smartphone data is informative, but complex



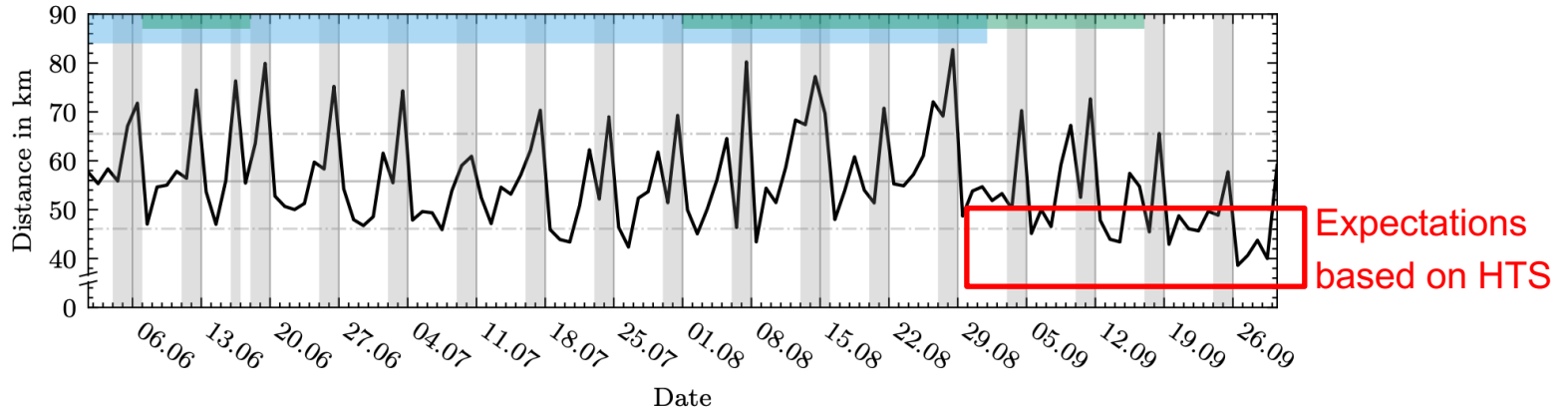
Issue of trip identification



People used more public transport



Bias in daily travel distances or just post-covid travel?



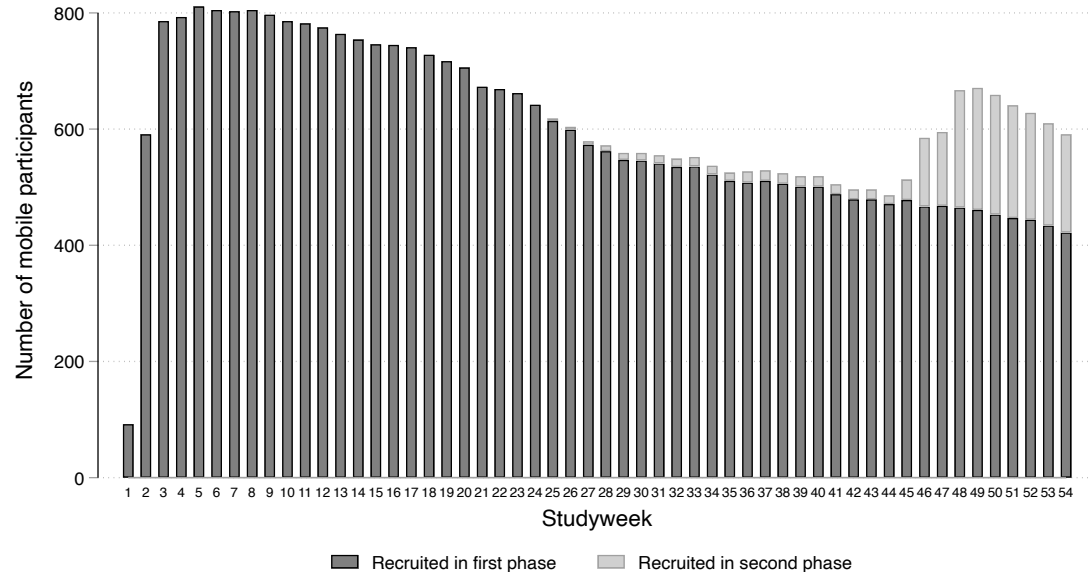
- Daily Avg. Travel Distance
- - - Standard Deviation
- Mean Travel Distance
- Weekends & Public Holidays
- 9EUR-Ticket
- School Holidays

General findings

- A complex set of interactions makes it difficult to attribute cause and effect (three natural experiments, COVID-19 recovery, season, Oktoberfest)
- Increased leisure travel by public transport at the beginning of June and in August; little to no changes in habitual travel
- A few people indicated some sort of “activation” to increase public transport usage at least a little in the post-ticket period

Outlook: Deutschlandticket

- In May 2023, a permanent successor to the 9-Euro-Ticket was introduced for 49-Euro/month
- We continued data collection until July 2023 (June, July is currently in acquisition)
- We will present the results at TRB 2024



Lessons learnt: Overall

- Increased public transport usage, but primarily for (induced) leisure trips; eventually, the entire experiment is not meaningful for estimating demand elasticity ($\beta_c > 0$ in our case)
- Politics was (too) quick, but also not interested in travel behavior research
- The public
 - showed interested in research (but not at the COVID-19 level)
 - its perception of public transport improved
- This shock was also an incentive for public transport companies to innovate, e.g., selling upgrades to the Deutschlandticket

Lessons learnt: App

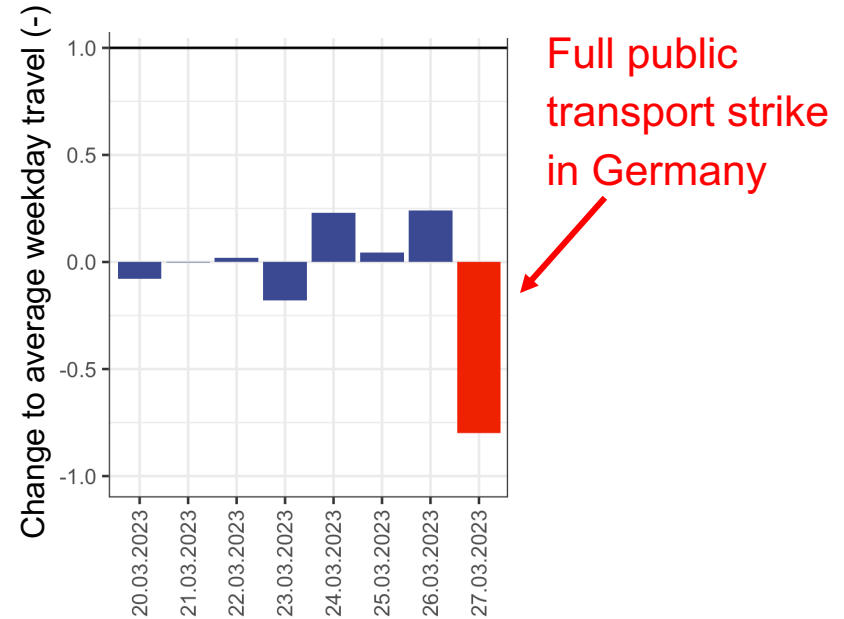
App data is promising, but recruiting costs are high, skilled analysts are required, and yet no assessment methods for such panel data exists

- We were surprised by people's willingness to share data (gamification part?)
- 4-times fewer app drop-outs when paying an incentive
- Building up the data pipeline and testing required around 6-12 PMs
- Suggested ramp-up period when using such an app for experiments 4 weeks

Outlook to other quasi-natural experiments



Foto von [Chandramohan Sudar](#) auf [Unsplash](#)



Thank you very much for your attention!

Questions?