Incrementality and the Importance of Attention Metrics

Vadim Tsemekhman
ANA Meeting, October 30, 2020

"Half the money I spend on advertising is wasted; the trouble is, I don't know which half."

John Wanamaker, 1920

- We have known for 100 years that a large part of the marketing and advertising budget is wasted
- We just did not know how to identify this part

… until the rise of the internet

- We now knew which individual ad exposures were associated with purchases and which were not
- Problem solved! … Not really

The first principle is that you must not fool yourself – and you are the easiest person to fool.

Richard Feynman

Every existing touch-based marketing and advertising measurement solution produces bad metrics having nothing to do with actual causal impact of marketing campaigns. These metrics are useless for marketers who need to determine how effective their campaigns are in driving up overall sales.

Industry experts are questioning the efficacy of digital media

Harvard Business Review

MARKETING

Did eBay Just Prove That Paid Search Ads Don't Work?

by Ray Fisman

March 11, 2013

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the Correspondent

Analysis

6 November 2019 • Reading time 21 - 26 minutes • Remind me later

In 2018 $273bn was spent on digital ads globally. We delve into the world of clicks, banners and keywords to find out if any of it is real. What do we really know about the effectiveness of digital advertising?

The new dot com bubble is here: it's called online advertising

Why Now?

"Only when the tide goes out do you discover who's been swimming naked."

Warren Buffet

Marketing budgets were slashed in spring 2020 due to COVID-19

- Conversion rate of the users who visited marketers' sites did not drop, though retargeting campaigns were turned off or drastically curtailed

- Rate of new customer acquisition increased even though marketing acquisition campaigns shrunk

- Retention rate did not drop noticeably either despite significantly scaled down marketing campaigns targeting existing customers

Why Now?

Current measurement and optimization of deterministic user-level metrics are going away anyway under privacy-driven industry changes and will become completely impossible by 2022 with the death of third-party cookies and device IDs

6

Safari ITP and Chrome will redact user IDs from any data sharing

Apple Safari now blocks all third-party cookies by default

26 MAR 2020 0

Apple, Apple Safari, Web Browsers

Mobile Device IDs Will Be The Next Ad Tracker To Bite The Dust

by Allison Schiff // Monday, February 10th, 2020 – 6:00 am

Share: 🐦 f in ✉

Mobile advertising IDs are probably not long for this world.

Neither Apple nor Google – which is fresh off announcing its plan to kill third-party cookies in Chrome less than two years from now – has taken concrete steps to eliminate their respective device IDs as of yet, but the app ecosystem should be preparing for that eventuality.

Even Facebook seems worried. Facebook CFO
Dave Wehner recently cited "product changes and future plans" coming from mobile operating

None Shall Pass

Opportunity

- A brand that spends $20M in digital advertising would see negative incremental ROI

- It would see no overall revenue downside if it withheld $10M - $18M of its digital ad spend

- Smart reallocation of this wasteful spend and optimization to incrementality will result in 2-3x increase in incremental ROI and continuous growth of overall sales

Even if marketers could solve Wanamaker's problem, they still would not be able to grow their overall revenue and turn marketing from cost center to revenue generator.

The right measurement alone is not enough. Marketers need the means to optimize their campaigns to their causal impact.

Solution: Causal Measurement and Optimization Technology

Should you find yourself in a chronically leaking boat, energy devoted to changing vessels is likely to be more productive than energy devoted to patching leaks.

Warren Buffett

Change Vessels. Use Causal Measurement and Optimization Technology.

Incrementality:

Incrementality is the measure of the causal impact of a marketing campaign.

The true effectiveness of a marketing campaign is measured through incremental metrics, such as the incremental ROAS, which is based on the campaign's incremental sales - the sales that would not have happened without the campaign.

Incrementality Measurement

"It doesn't matter how beautiful your theory is, it doesn't matter how smart you are. If it doesn't agree with experiment[s], it's wrong" – Richard Feynman

The only accurate way to measure incrementality is to conduct properly designed experiments: Randomized Controlled Tests (RCTs)

A Personal Story

Incrementality Measurement

A single person cannot be both treated and untreated. ***And not every person has a twin***. Randomized controlled tests (RCTs) are designed to reproduce both states statistically by splitting the entire audience into Test and Control groups.

Incremental sales rate is the difference between sales rates in Test and Control groups. So by its nature, Incrementality Measurement based on RCTs needs to operate at the cohort level and cannot work at the user level.
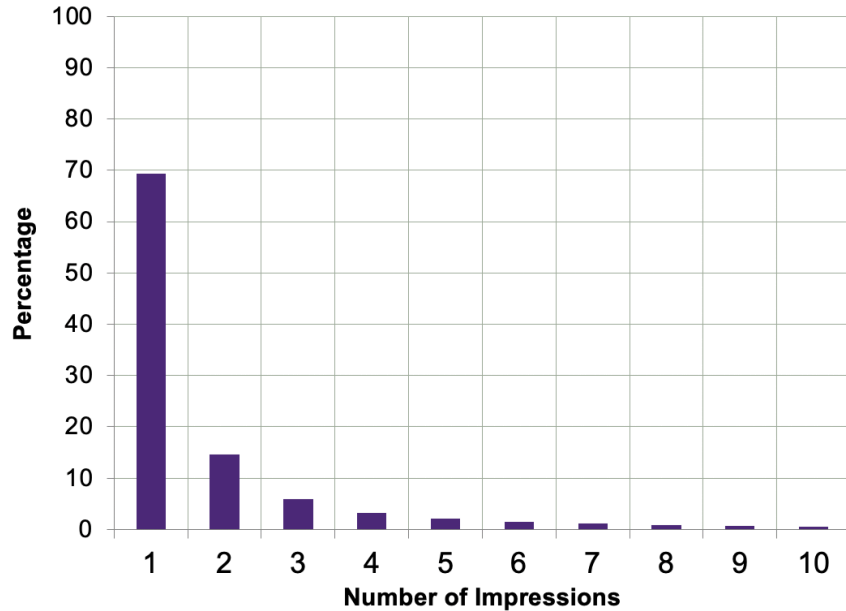
How Do You Optimize Campaigns to Incrementality?

- Who? Audience
    - Segmentation
    - Uplift modeling
- What? Creative
    - Multi-armed bandits
    - Contextual bandits
- Where and How? Placements, frequency
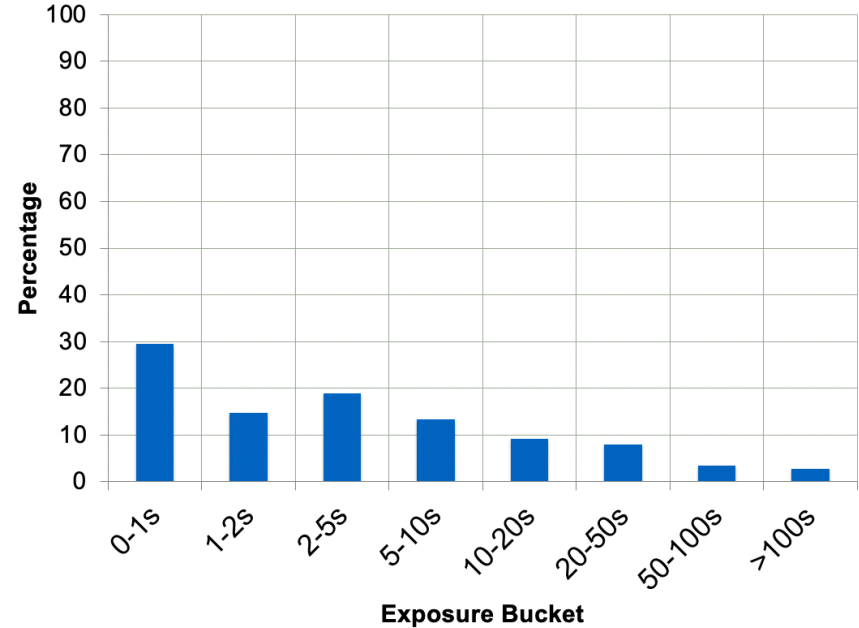   - Attention metrics
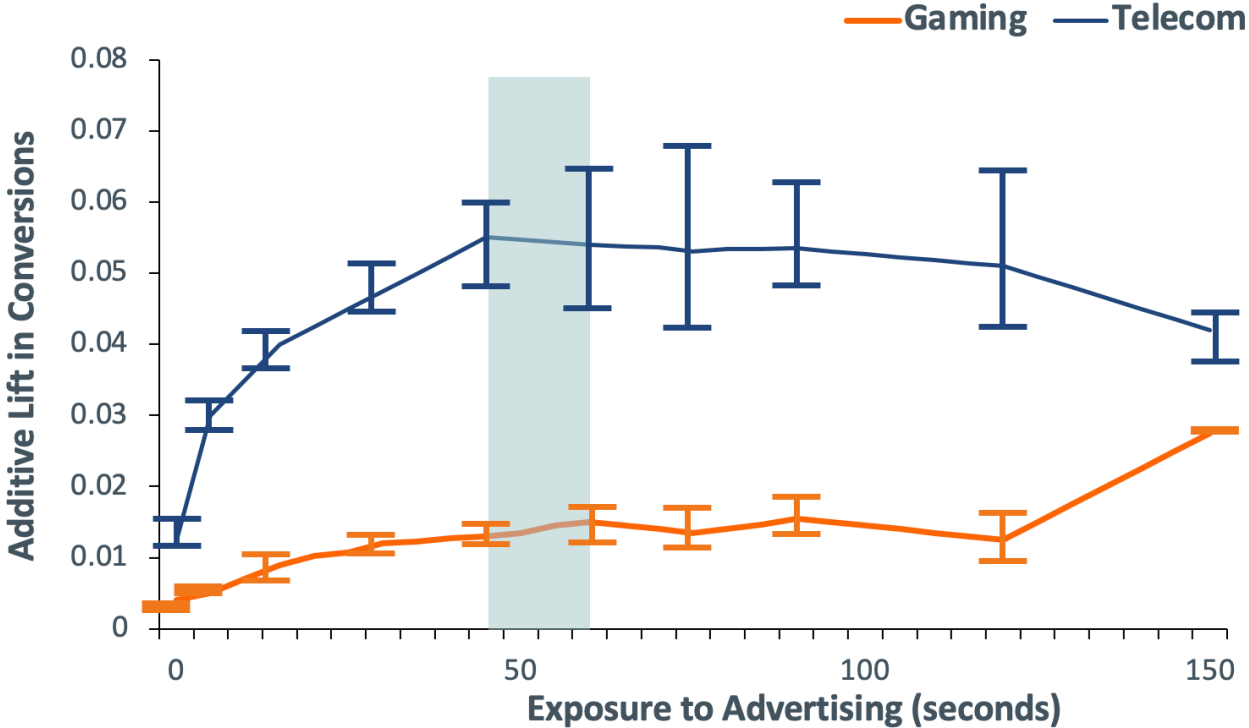
User Exposure – Typical Campaign

Frequency: Percentage of Users By Number of Impressions
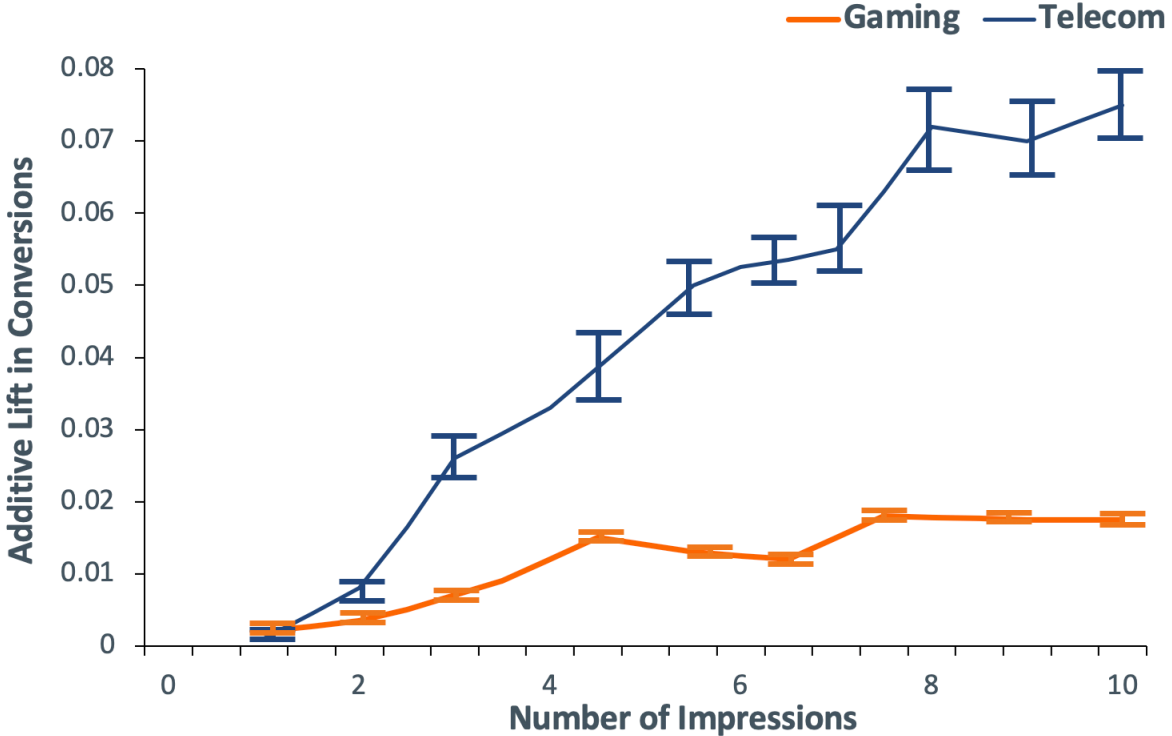
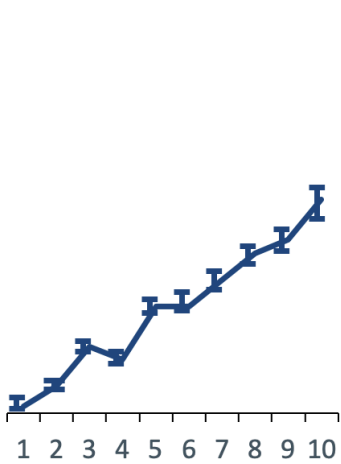**Percentage of Users By Total Exposure Time**

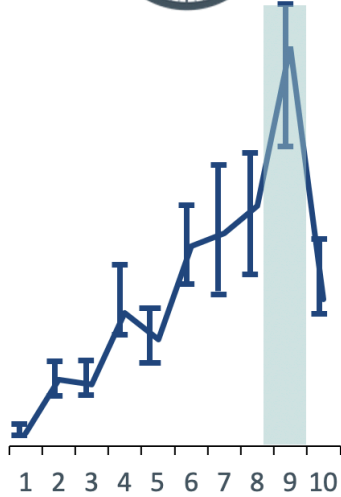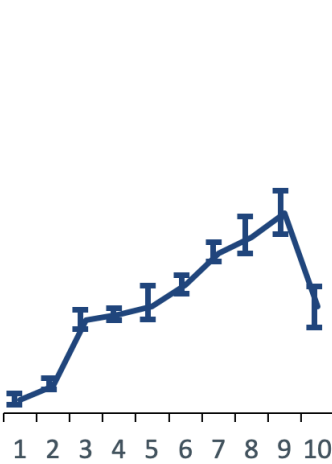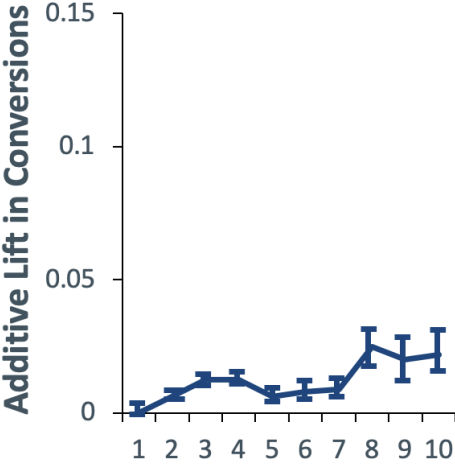# Effect of Total Exposure Time on Incremental Conversions

Effect of Repeated Exposure on Incremental Conversions

Combined Effect of Exposure Frequency and Duration

Important: Design Experiments and Technology Correctly

- Do not fool yourself

- Modeling only provides a hypothesis

- ***Properly designed*** RCT validates or invalidates hypotheses

- Proper technology should be able to optimize in-flight

Market will shift to causal measurement and optimization via Uplift Modeling and Bandits

	Measurement	Modeling & Optimization
Causal (at the Cohort-level)	Randomized Control Trial (RCT)	Uplift Modeling and Bandits Modeling of Attention metrics and their targeting
Non-Causal (at the User-level)	Touchpoint Based (LTA, MTA)	Propensity and Attribution Modeling
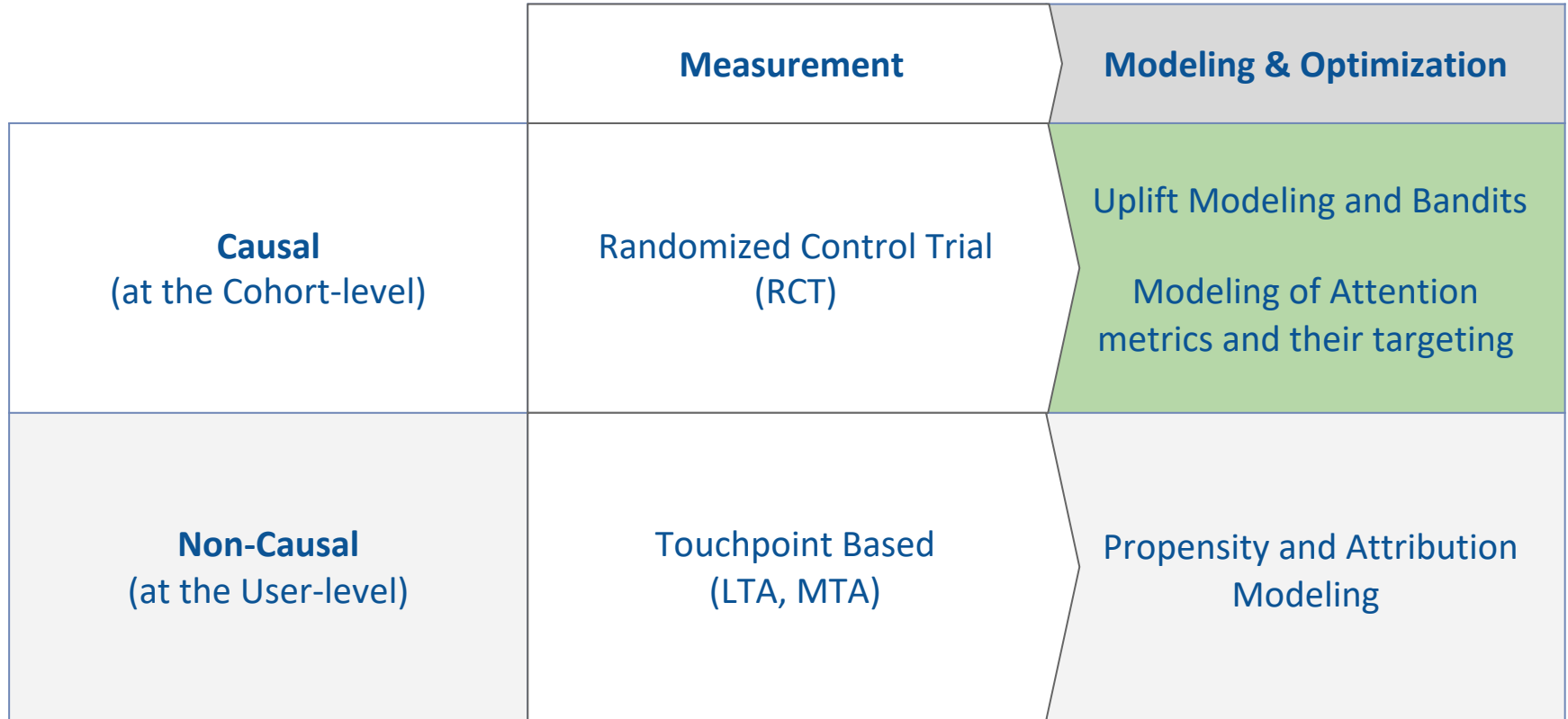
Appendix

Why do we need a technology to run marketing measurement and optimization?

Marketing experiments are hard
- Traditionally, incrementality measurements have been based on one-off marketing experiments and executed by A/B splits
- It is hard to set them up correctly
- It is even harder to set up several experiments at the same time without mutual bias
- It is a lot harder to run experiments at scale and across channels
- The results of marketing experiments are often inconclusive, and optimization to incrementality based on current approach to measurement is extremely hard
- It is unclear what business decisions can and will be made based on the results of the experiments

Why do we need to build marketing experimentation technology?

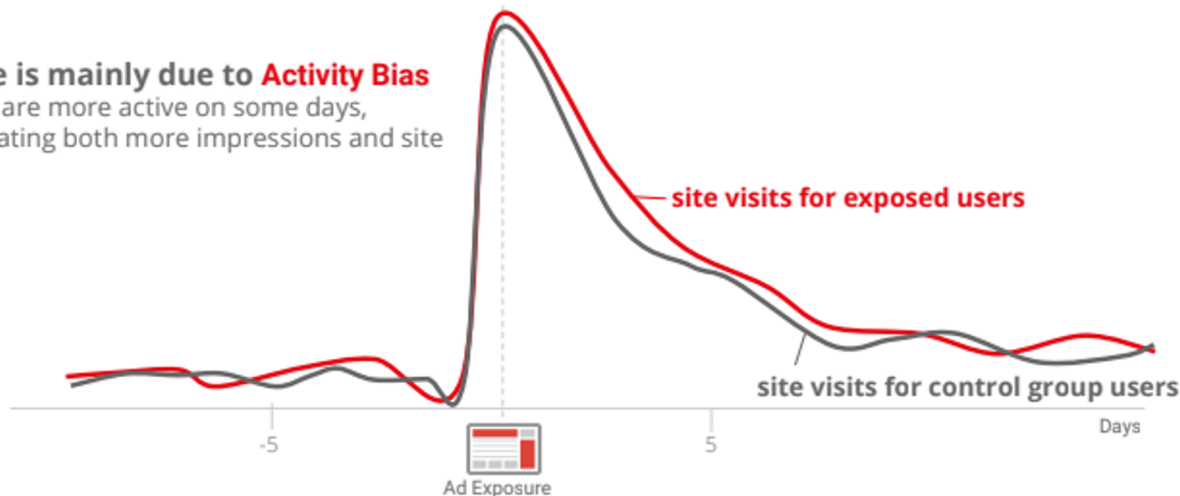**Marketing experiments require a lot of time and attention to detail**
- Experiment setup requires clean identity graph. Without it, experiments are heavily contaminated and biased.
- Experiment setup requires proper integrations with partners.
- Processing of experimental results requires clean identity graph and clean data. Both are hard to get to.
- Analysis requires seamless access to data
- Currently, one-off data extractions and transformations need to be built for every analysis resulting in long cycles and no continuity
- Significant amount of data scientists' time has to be dedicated to each experiment
- It is a daunting task for marketers to automate and scale marketing optimization to incrementality using experiments - across channels, partners and campaigns.

Repeated experiments cast doubt on the current state of measurement

Advertisers struggle to measure ad effectiveness

Does this Yahoo display campaign drive site visits?

Spike is mainly due to Activity Bias
Users are more active on some days, generating both more impressions and site visits.

site visits for exposed users

site visits for control group users

Days

-5

5

Ad Exposure

Lewis, R.; Rao, J.; Reiley, D. (2011), "Here, There, and Everywhere: Correlated Online Behaviors Can Lead to Overestimates of the Effects of Advertising", http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2080235. This chart is a stylized representation of their results.

NETFLIX

Early adopters of scientific measurement have come to the same conclusions

Uplift Modeling with Cohorts

Uplift Modeling discovers features distinguishing purchasers who would not have converted without exposure to ads from customers who would have converted anyway.

The model is then applied to all consumers to find users whose purchasing behavior is likely to be impacted by the ads and to construct audience to be targeted.

Uplift vs Propensity Modeling comparison

|	Goal	Target Audience	Data
Uplift Modeling	increase sales	high probability to buy *when subject to advertising*	user- or cohort-level
Propensity Modeling	claim credit for sales	high probability to buy *regardless of exposure to advertising*	user-level

Audience Segmentation Framework for Uplift Modeling

Propensity Modelling Audience Optimization

		Probability of buying if exposed to advertisement (Treatment)	
		Low	High
Propensity to buy if not exposed to advertisement (Control)	Low	Lost Causes	Persuadables
	High	Defiers	Sure Things
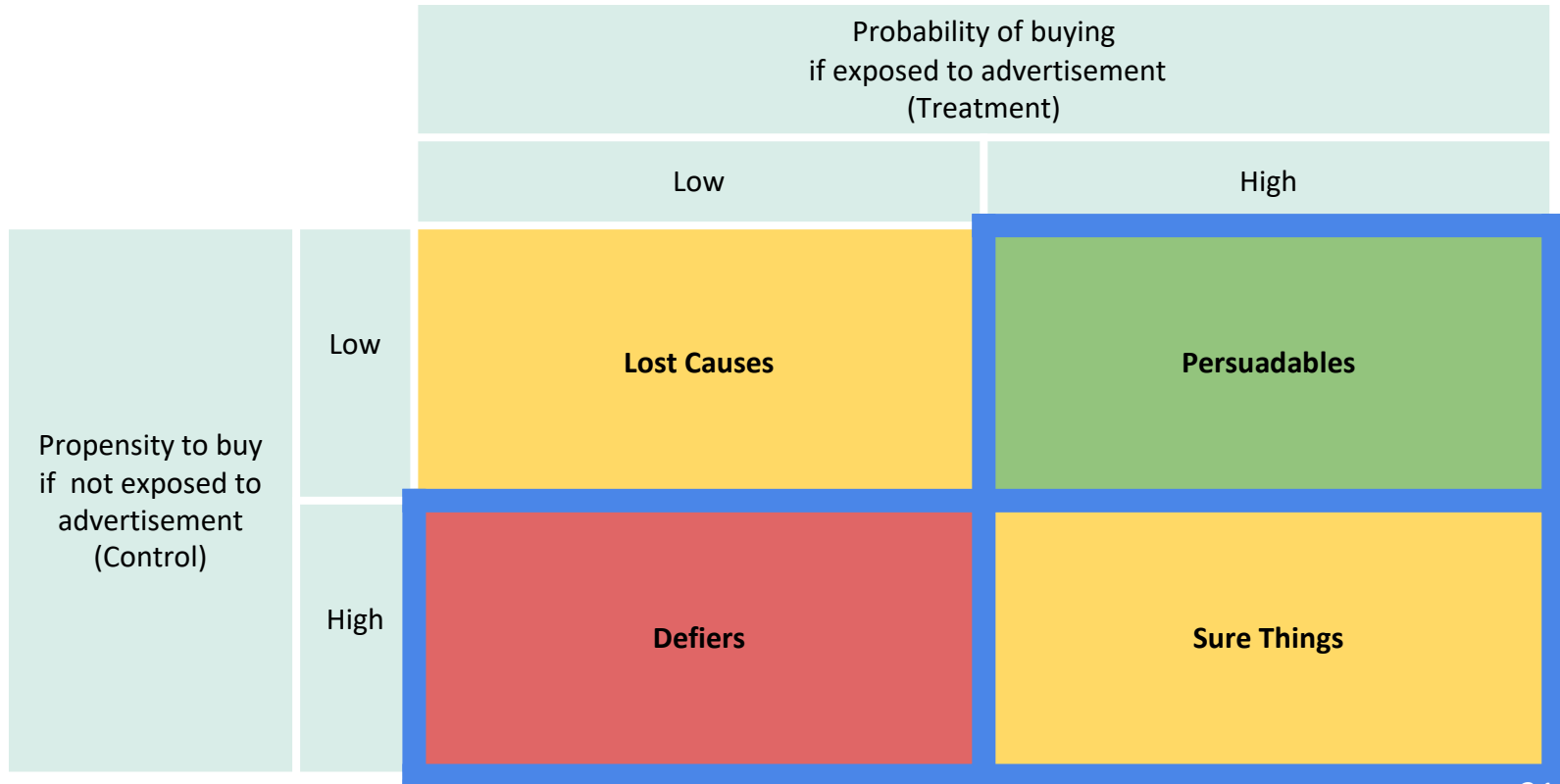
Propensity Modelling Audience Optimization - with heavy algorithmic optimization
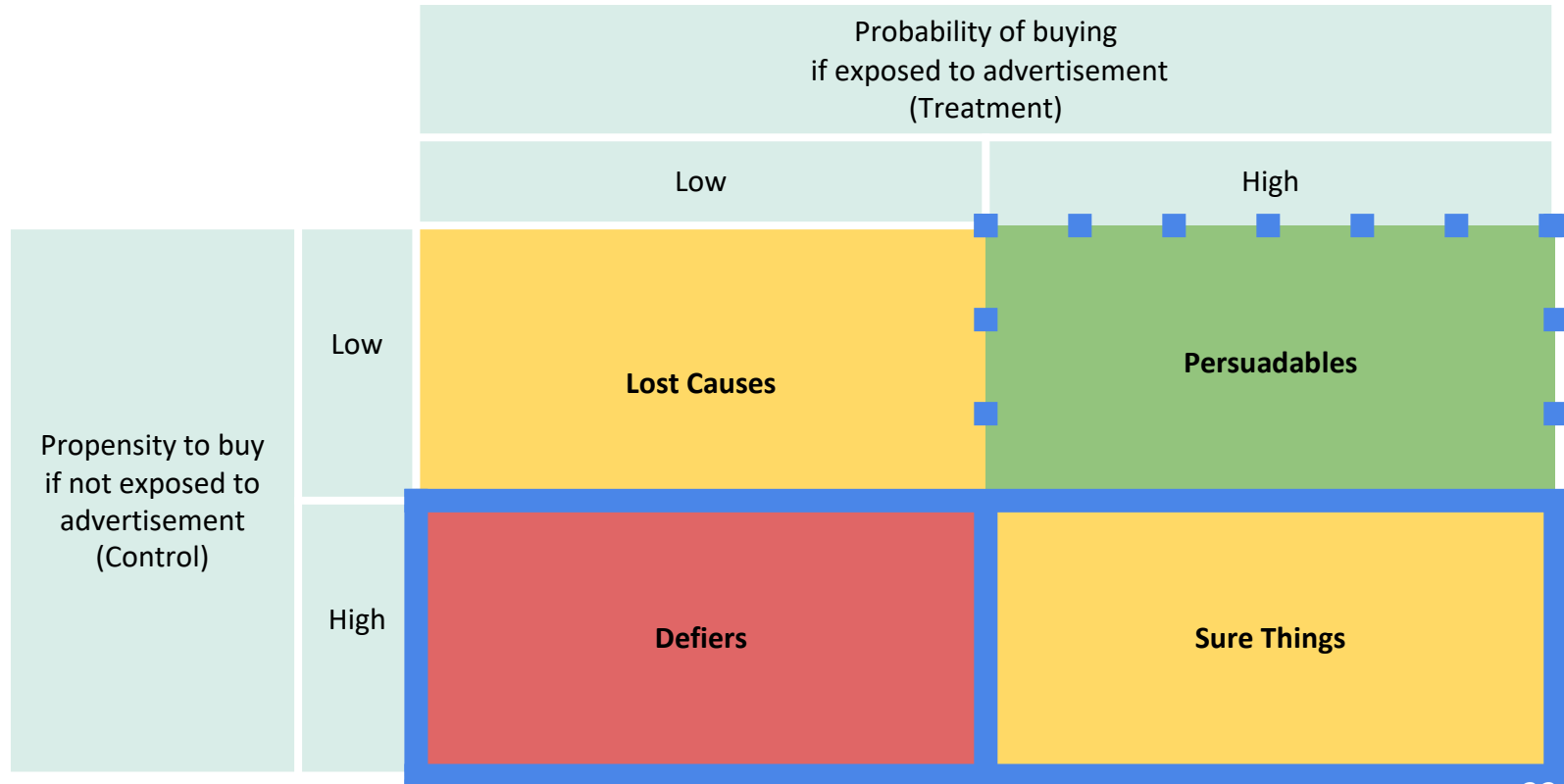
Uplift Modeling Audience Optimization