

# Online Advertising Incrementality Testing

## Practical Lessons, Paid Search And Emerging Challenges

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# Who we are ...



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\*Work done while employed at Yahoo! Research.

# Tutorial Parts

1. The basics: context and challenges
2. Incrementality Testing: concepts, solutions and literature
3. From concept to production: platform building, challenges, case studies
4. Deployment at Scale: test cycle and case studies
5. Emerging trends: identity challenges, industry trends and solutions

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# Part 1

## The basics: context and challenges

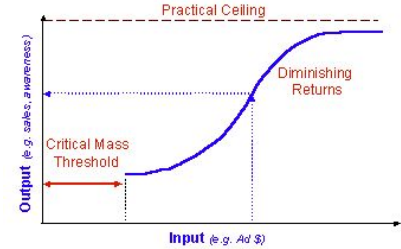
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# Context: Business Need

*Kireyev et al. (2016), Li and Kannan (2014)*

Response Curve



## Why we need to run incrementality tests

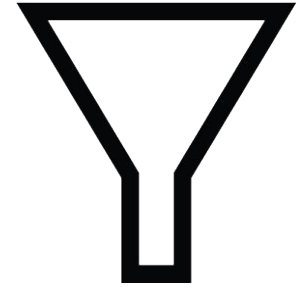
1. Measure channel spend effectiveness for **optimal budget allocation** and planning.
  - Channels are often **marketing specific media**, eg social, paid search, programmatic display, TV, radio, etc
2. Calibrate **Media Mix Models** to estimate the channel response curve at different spend levels
  - *Media Mix Models* are often **financial time-series based models** that predict aggregate marketing spend performance in yearly/quarterly planning

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# Context: Business Need

*Kireyev et al. (2016), Li and Kannan (2014)*



**As a result, tests are often run at channel aggregate level**

1. Channel level requires **all advertiser spend** aggregated over weeks (even months) of testing
  - Results often inform quarter budget allocations with a measure of lift and efficiency, e.g., **cost per incremental conversion (CPIA)**
2. **CPIA** provides a **reliable comparison with other channels** regardless of the channel in the funnel
  - A standard challenge with spend planning based on last-touch attribution is the **highly imbalanced conversion rates between demand-capture and demand generation channels**

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# Context: Business Demand for Testing

*Chan et al. (2010), Gordon et al. (2019)*

## Why testing when we have numerous causal inference frameworks?

1. Because observational studies without deliberate interventions often **greatly overestimate** the value of online ads
  - Even in the **presence of rich confounding features**, *Gordon et al* could not **replicate experiment** results in a large number of tests and with multiple causal inference techniques
2. Running **randomized controlled experiments** is the gold standard in marketing incrementality measurement.
  - A widely accepted notion in the online advertising industry

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# Context: Business Use Cases 2,3 of 4

## *Barajas and Bhamidipati (2021)*

### Typical use cases for online advertising vendors

- **New advertiser** wants to *test waters* before fully deploying budgets
  - Generating trust, a successful test leads to **incremental revenue** for the ad network
- Existing advertiser wants to **scientifically prove incremental value**
  - Regular incrementality tests to **assess the strategy**, from advertiser's conversion metric definitions to provide certainty of the current budgets

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# Context: Business Use Cases 3, 4 of 4

## *Barajas and Bhamidipati (2021)*

### Typical use cases for online advertising vendors

- Incrementality of **tactical practices** with external validity for future deployment
  - Examples include: **CRM vs new customers, prospective vs remarketing**, etc
- Quarterly regular **strategic adjustments** (retrospectively)
  - From test insights, **targeting and optimization recommendations** to improve incremental value

**yahoo!**



# Testing in a Nutshell

Why incrementality testing is hard?

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# Incrementality Testing in a Nutshell

## Goal:

Find Aggregate Effect of Marketing Spend

## Randomized unit:

Users (our best notion)

## Intervention:

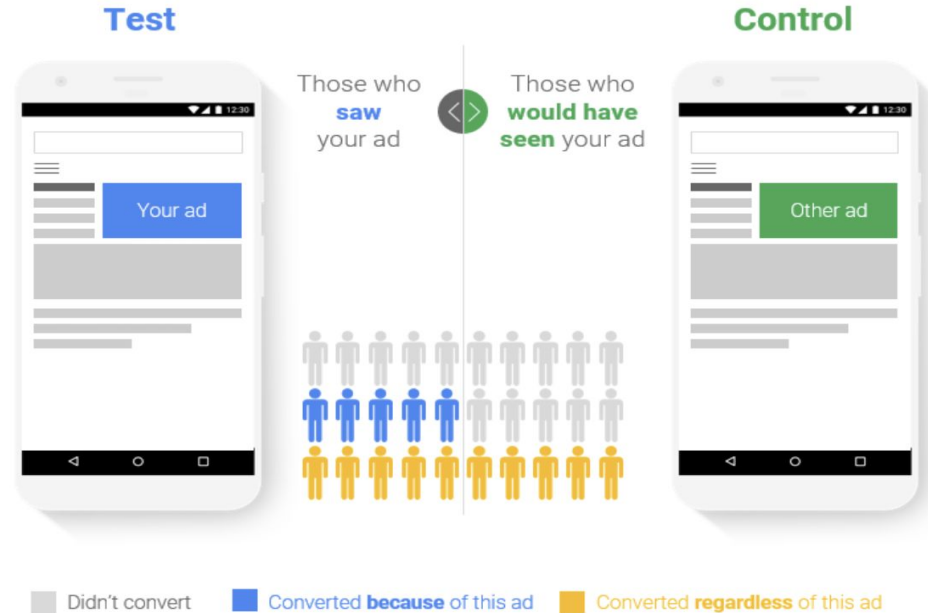
Marketing Spend leading to ad delivery

## Control:

No marketing ads

## Metrics:

Converter Lifts, Cost per incremental converter/conversions, among others



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# Incrementality testing example

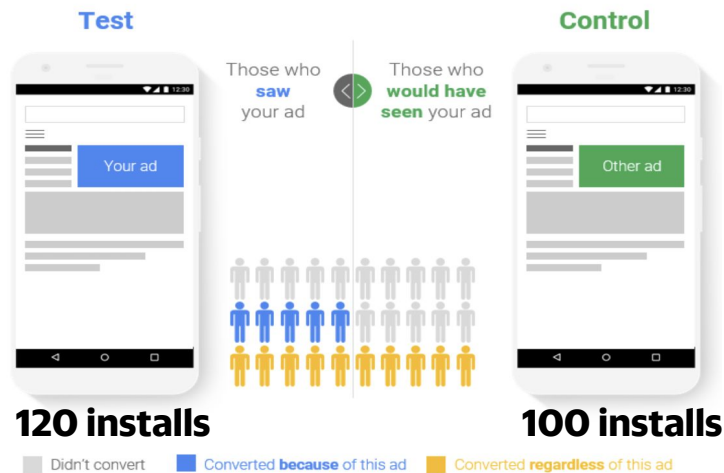
## Situation

- Group A (control group, showing no ads): 100 installs
- Group B (exposed group, showing ads): 120 installs

This would suggest that your ad spend caused 20 additional installs.

From these figures, you can calculate the lift and incrementality:

- Lift is the increase from Group A to Group B (20 installs, 20% increase)
- Incrementality is the percentage of Group B that converted due to marketing spend (20 installs, 16.7% of Group B total).



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**If this is *just* an A/B test,  
why do we need more?**

**We'll review in next part of the  
tutorial....**

**yahoo!**

