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# Internet Display Advertising: What is Known?

Randolph E. Bucklin  
Peter W. Mullin Professor  
UCLA Anderson School of Management  
Charter Director of the MASB  
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Marketing Accountability Standards Board  
of the Marketing Accountability Foundation

# Overview

- **Highlights from Past Research by Academics**
  - Effects on clickthrough, awareness, and consideration
  - Effects on purchase and purchase intent
- **Practical Issues for Internet Display Advertising**
  - Fast progress (funnel-based metrics, targeting)
  - Challenges
    - Impressions, reach, frequency, GRPs
    - Incorporating display into mix models
    - Attribution (e.g., display versus search)
- **Summary/Q&A**

# Modeling Click-Through

- What is the nature of click-through response to banner ads?
- Modeling approach: predict click given banner ad exposure (and no prior click)
- Data: site-centric clickstream, 8 months from 1995
- Findings
  - Propensity to click varies widely (baseline of .039)
  - Additional ad exposures decrease click-through probabilities, but at a decreasing rate
  - New visitors and less frequent visitors more likely to click on banner ads

Chatterjee, Hoffman, and Novak (2003), "Modeling the Clickstream: Implications for Web-Based Advertising Efforts," *Marketing Science*.

# Behavioral Response to Banner Ads

- How do web users react to and recall banner advertising?
- Eye tracking study: 49 percent of banner ads “seen”; many subjects appeared to be avoiding the ads
- Memory study (807 respondents) showed ads still “work”
  - Strong measures for aided advertising recall (30.1%), aided brand recognition (18.5%), and unaided ad recall (11.4%)
  - Change in brand awareness (pre vs post survey): 2.8%
  - Repetition positively affects recognition, recall, and awareness
- Implication: use traditional ad metrics, not clickthrough rate (0.7 % at the time and falling)
- Using a web-survey, another study found that “perceived goal impediment” was the biggest explanatory factor in respondents’ banner ad avoidance behavior

Dreze and Hussherr (2003), “Internet Advertising: Is Anybody Watching?,” *Journal of Interactive Marketing*.  
Cho and Cheon (2004), “Why Do People Avoid Advertising on the Internet,” *Journal of Advertising*.

# Is Browsing Mode Relevant?

- Does goal-directed browsing versus exploratory surfing affect recall for banner advertising?
- Experimental study
  - Goal directed versus surf/exploratory manipulated by instructions to subjects
  - Data from 234 student subjects
- Findings for memory measures (goal versus surf)
  - Recognition (.15 versus .50)
  - Aided recall (.05 versus .22)
  - Unaided recall (.02 versus .26)

Danaher and Mullarkey (2003), "Factors Affecting Online Advertising Recall," *Journal of Advertising Research*.

# Effects on the *Next Click*

- Does exposure to banner ads affect *subsequent* page view choices made by users within a web site?
- Data
  - Automotive website (site-centric data from 2004)
  - Exclusive (fixed placement) banner ads by 3 car makes
  - Clickstream records of site visitation record ad exposure and browsing behavior (page-type choices)
- Model page-view choices of users by automotive make
- Findings
  - 54/46 split of responsive and non-responsive visitors
  - Behavior of responsive users fits “browsing mode”
  - Elasticities of page-view choices for responsive users ranged from .11 to .17, depending upon the make/ad

Rutz and Bucklin (2009), “Does Banner Advertising Affect Browsing Paths?” Working Paper, Yale SOM.

# Effects on Purchase

- Does exposure to banner advertising affect subsequent purchase behavior?
- Modeling approach: link purchase timing to previous banner ad exposure at the individual level
- Data: purchase transactions for a HBA site, cookie-level exposure data to the site's banner advertising
- Findings
  - Effect of exposures is positive, with diminishing returns
  - Estimated banner ad elasticity is low, .02
  - Exposure to more creative executions not necessarily helpful

Manchanda, Dube, Goh, and Chintagunta (2006), "The Effects of Banner Advertising on Internet Purchasing," *Journal of Marketing Research*.

# Effects on Purchase Intent

- Study of 2892 web display ad campaigns
  - Treatment vs. control samples, random ad serving
  - Examined effect on surveyed purchase intent (also recall)
  - Ad characteristics
    - Contextually matched
    - Intrusiveness (e.g., pop-up, take-over, auto-play video)
- Findings
  - Exposure boosts purchase intent (as well as recall)
  - Contextual targeting and intrusiveness also increase purchase intent, but their *interaction is strongly negative*
- Privacy factors appear to explain the interaction (note, no interaction found for recall)

Goldfarb and Tucker (2009), "Online Display Advertising: Targeting and Intrusiveness," Working Paper, Rotman School, University of Toronto.



# Practical Issues for Display Ads

- **Basic metrics are based on data for impressions, clicks, and actions (note: analogous to paid search metrics)**
  - Overall campaign
  - Display ad channels (targeting)
- **Other approaches include**
  - Lift from A/B tests (for CPG and online)
  - Model-based estimates (e.g., mix models)
  - Surveys (awareness, attitudinal, purchase intent)

# Display Ad Campaign: Real Estate Related Service



Spend	Impressions	Clicks	Actions
\$51,680	27,752,812	19,115	2,365
	<b>CPM</b>	<b>CPC</b>	<b>CPA</b>
	\$1.86	\$2.70	\$21.85

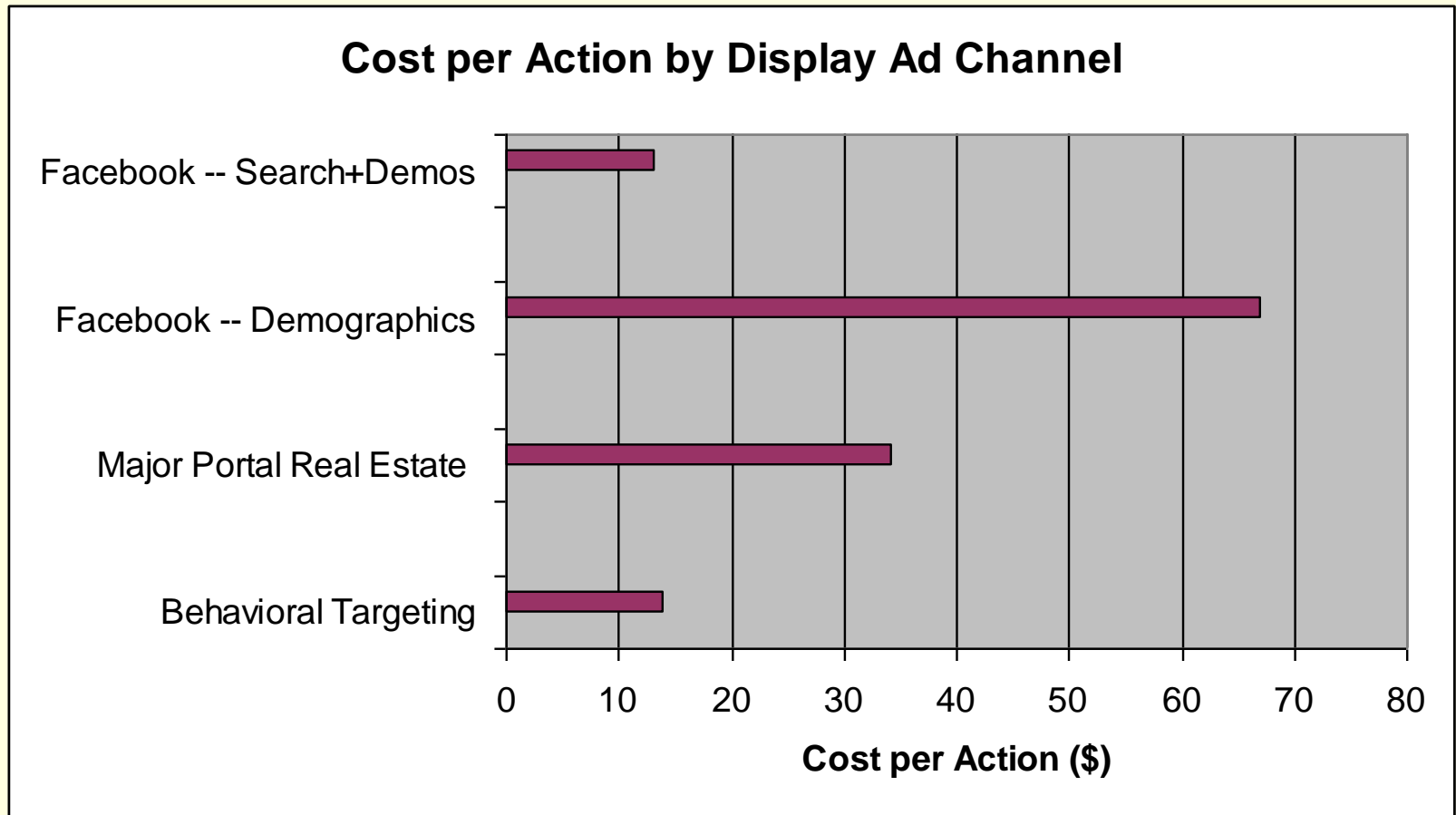
CTR = 0.069%

CPM = Cost per 1000 impressions

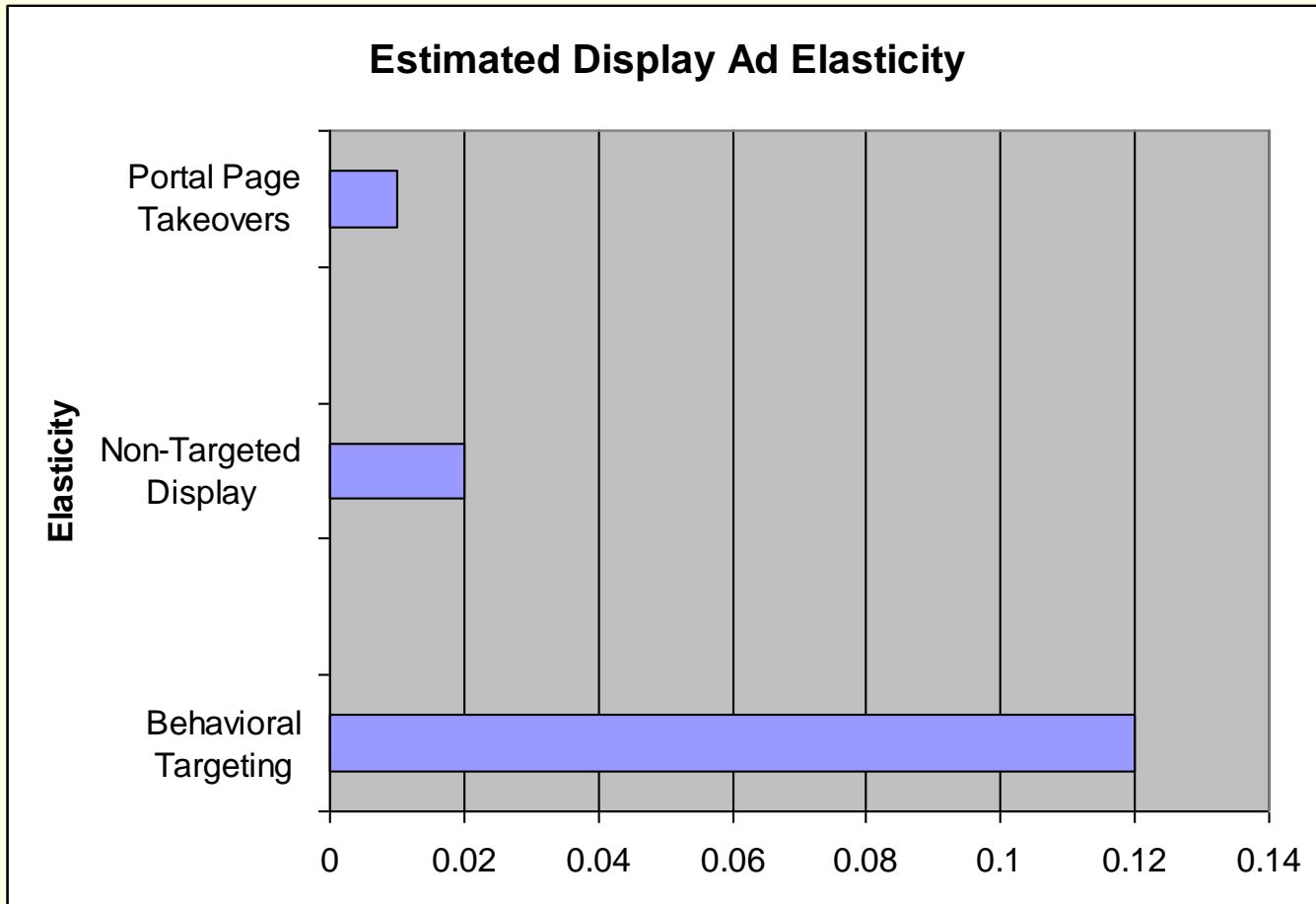
CPC = Cost per click-through

CPA = Cost per Action

# Metrics by Display Ad Channel



# Response by Ad Channel



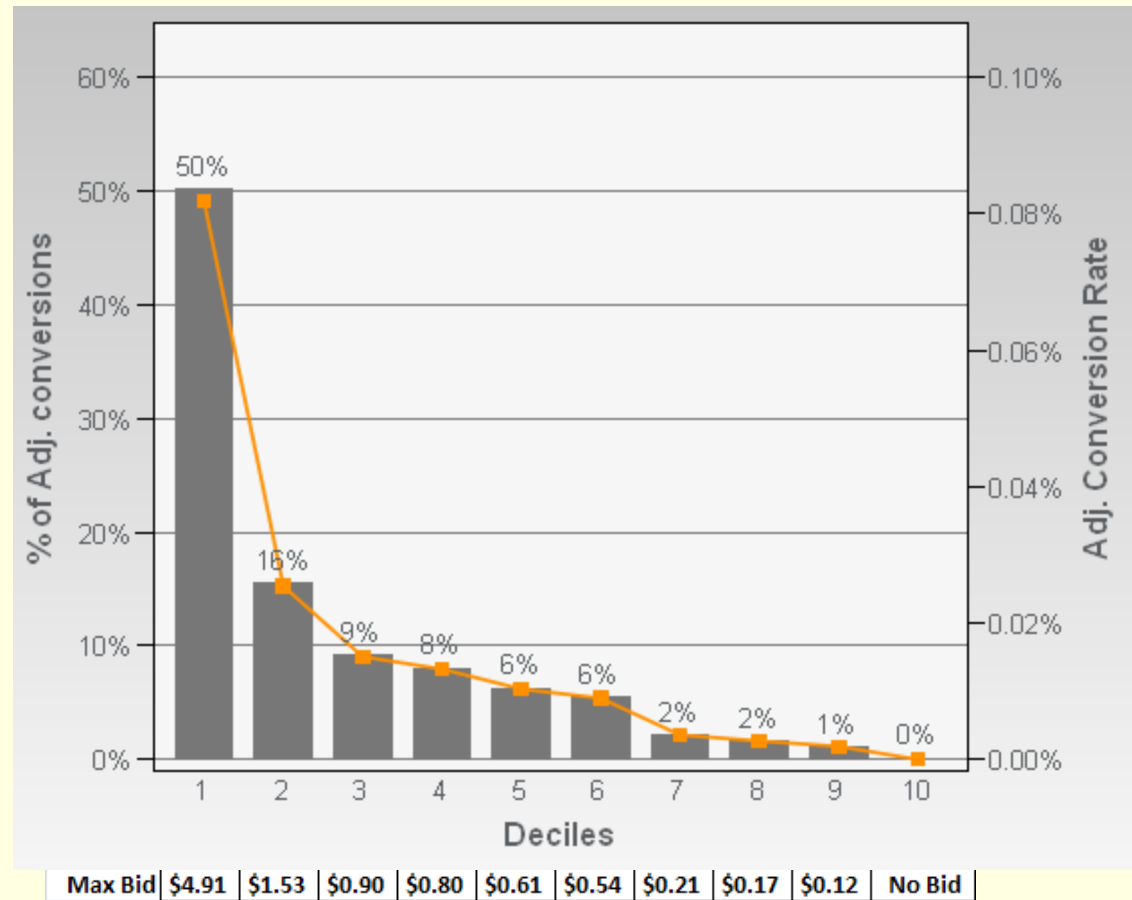
**Campaign Data for an Internet Financial Service**  
**Elasticity = % Change Signups / % Change Impressions**

# Targeting with Ad Exchanges

Statistical models used to predict the expected value of an impression

Bid higher amounts for higher expected values

Example courtesy of x+1



# Lift Metrics

- **Display ad campaigns are also assessed by the lift they provide over a baseline**
  - Test cell (panelists exposed)
  - Control cell (panelists not exposed, but similar to test cell in demographics and behavior)
- **Nielsen study**
  - 200 digital campaigns measured
  - Average sales lift 32% (consumer packaged goods)
- **ComScore study**
  - 139 digital campaigns
  - Average advertiser site visitation up 46%

# Bringing Display into Mix Models

- **Challenges of measuring an interactive versus a fixed medium**
  - GRP metrics can be problematic
  - Cookie-based measures can be problematic due to blocking and deletion
  - Inventory “inflation” also noted as a concern
- **Other challenges**
  - Low spend/impact versus offline in a noisy world
  - Highly correlated activity variables
  - Different models give different results on the same data!

# Is Display Undervalued?

- Usual practice is to “credit the last click”
- Evidence suggests display advertising can provide a boost to subsequent search activity
  - ComScore study found lift in generic search (47%) and branded search (33%)
  - WPP Group analysis reported a 32 to 51 percent lift in overall conversion when display used with search
- Should display get credit for the “assist”?  
If so, how?



# Display Ad “Assists”

Keyword	Last Click Conversions	Number of Display Ad Exposures					
		0	1	2	3	4	5+
Winter vacation	0	0	0	0	0	0	0
Winter vacation spots	5	1	1	2	0	0	1
Cancun travel	3	1	1	0	0	0	1
Cancun hotels	1	0	1	0	0	0	0
Cancun hotel deals	6	2	1	0	1	0	2

# Summary

- Academic research has investigated many of the effects of display advertising
  - Clickthrough, awareness, consideration
  - Purchase, purchase intent
- Industry practice in applying basic metrics and optimizing targeting appears to be advancing rapidly
- Issues that still need further work include
  - Measuring the media (impressions, GRPs, cookies, etc.)
  - Connecting display advertising with sales outcomes
    - Academic research to date has been very limited
    - Challenges in modeling the effects of display alongside other marketing activity and media, especially for offline sales
  - Attribution to display versus search
- Q&A and discussion

# A Thank You to Industry Experts

- **Dipita Chakraborty, Nielsen**
- **Gian Fulgoni, comScore**
- **Mike Hanssens, Market Share Partners and UCLA**
- **John Nardone, x+1**
- **Mike Solomon, The Search Agency**
- **Jennifer Zola, Mediaedge: CIA, a WPP Company**
- **Interactive Advertising Bureau**



# Thank-you!



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# MASB Standards Project

## Measuring & Improving Return from Interactive Advertising

Bill Seely  
Randy Bucklin



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# Interactive Project

- I. Frame-Up (Emerging Issue Project Abstract)
  - A. Open Debate by MASB (revisions/approval)\*
- II. Research
  - A. What is Known/not Known/need to Know\*\*
    - 1. Open Debate by MASB (revisions/approval)\*
    - 2. Paper for Practitioners (revisions/approval)\*
  - B. New Learning
  - C. Preliminary Summary & Conclusions
- III. Review
  - A. Open Debate by MASB (revisions/approval)
  - B. Open Debate by MASAC (revisions/approval)
  - C. Posting for Industry Feedback (revisions)
- IV. Adoption or Acceptance by MASB
- V. Publication
- VI. Education
- VII. Systematic review over time (revisions)

\* Explicitly approved by majority of MASB Directors & Chair (# dissents noted in output)

\*\* About measurement . . . for reporting, forecasting and improving return