The Optimal Target of Retargeted Ads

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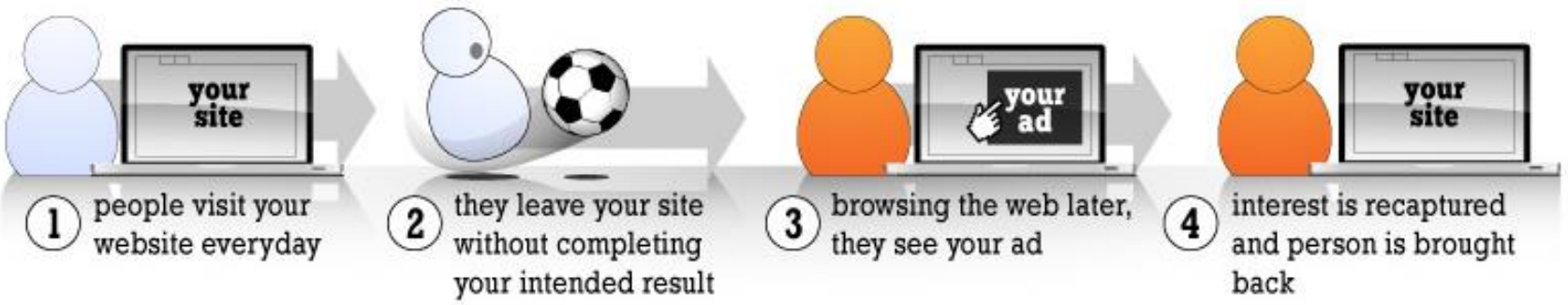
What's Retargeting?

- Wikipedia: a form of online targeted advertising by which online advertising is targeted to consumers based on their previous Internet actions, in situations where these actions did not result in a sale or conversion
- Retargeting can be accomplished via display ads, search, e-mail, and now social media, as well as via Facebook's FBX ad exchange and Twitter



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Examples

$14.54 at Amazon - ★★★★½
amazon.com
Melissa & Doug Animal Pattern Blocks Set - $14.54

SPONSORED Create Ad

Still interested?
Buy it on ebay!

7,629,866 people like this

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Why Do We Care?

- 71% of Marketers spend between 10% to 50% of digital ad budgets on retargeting; 14% spend more than half.
- Nearly three out of five U.S. online buyers said they notice retargeted ads.
- Average CTR for display ads is 0.07 percent, for retargeted ads it’s 0.7 percent.
- While the majority of consumers (60 percent) remain neutral about retargeted ads, 25 percent enjoy them.

Empirical Findings

- Lambrecht and Tucker (2013): retargeted ads are, on average, less effective than their generic equivalents, and their effectiveness depends on the stage of consumers' purchase decision.

- Bleier and Eisenbeiss (2015a, 2015b): effectiveness of retargeting depends on the recency of the consumer's previous visit, the congruence between the product and the (new) website, and the consumers' trust in the seller.

Common theme: the effectiveness of retargeting depends on whom it targets

Research Question

- Should firms retarget consumers who browsed more or fewer products?
  - Formalize consumers' search process
  - Provide actionable recommendations on whom to target for retargeting

Big-Picture View of the Model

- Consumer aims to find a product of good match. Different sellers have different probabilities of carrying such a product.
- A consumer updates his belief about the seller's type during search, based on the product matches
- A consumer may leave a seller's website either intentionally or for an exogenous reason (e.g., an interruption). Retargeting can serve as a reminder and rekindle a consumer's interest.

Model Setup

- Consider a representative buyer. Sellers are ex-ante identical, each carrying a large selection of products.

- Seller type could be G, I or B, each with prior probability 1/3. There are three possible realized match values for each product searched: H, M and L.
  - $\Pr\{H|G\}=g$, $\Pr\{M|G\}=1-g$
  - $\Pr\{M|I\}=1$
  - $\Pr\{L|B\}=b$, $\Pr\{M|B\}=1-b$

Belief Updating

- After looking at one product on seller k's website, buyer's belief about k is

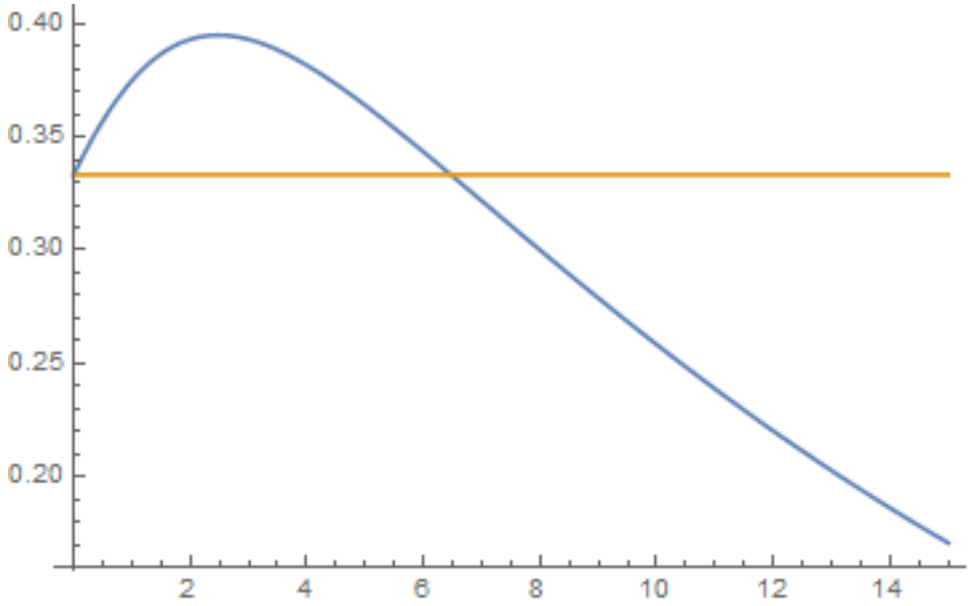
$$\begin{aligned}
\Pr\left\{f_k = G \middle| v_k^1 = L\right\} &= 0, \\
\Pr\left\{f_k = G \middle| v_k^1 = M\right\} &= \frac{1-g}{1-b+1+1-g}, \\
\Pr\left\{f_k = G \middle| v_k^1 = H\right\} &= 1.
\end{aligned}$$

- After looking at n products on seller k's website, buyer knows that seller type is G or B after seeing one H or L match value, respectively. Otherwise, buyer's belief about k is

$$\Pr\{G|M^n\} = \frac{(1-g)^n}{(1-b)^n + 1 + (1-g)^n}$$

Gist of the Model: Non-Monotonicity in Belief

- If 2g<b, the consumer's belief that the seller is a Good type, Pr{G|M^n}, first increases and then decreases with n.



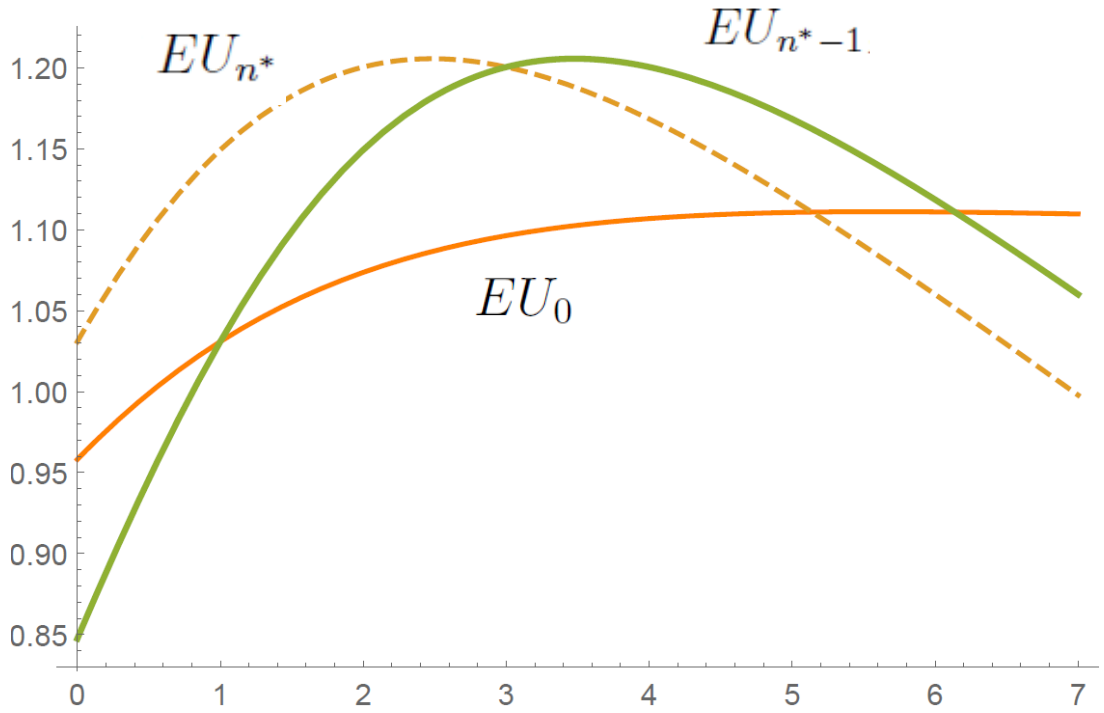
Example: g=0.1, b=0.5

Conjectured Optimal Stopping Rule

- If realized match is H, the buyer stops searching and buys the product
- If realized match is M, the buyer continues search on the seller's website unless he has already seen n* products on the site, in which case he switches to a different seller
- If realized match is L, the buyer moves on to the next seller

Determining the Optimal n*

- Buyer does not want to switch one product earlier
- Buyer does not want to switch one product later
- The above guarantee that buyer does not want to switch n products earlier or later



Example: α=0.3, g=0.1, b=0.5

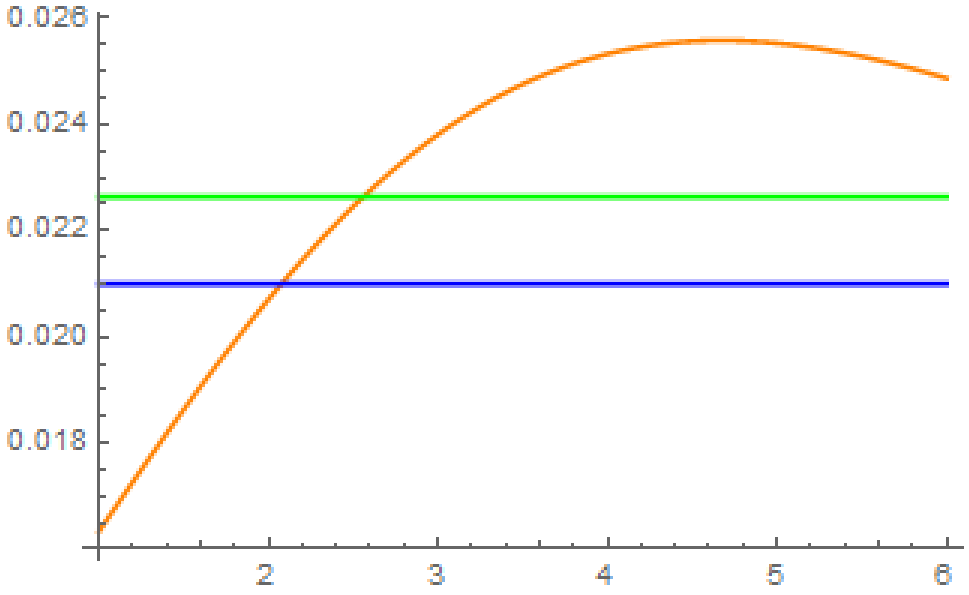
Optimal Retargeting Strategy

- If match value is redrawn according to the seller's type, probability that the buyer purchases the advertised product is

$$\Pr\{\text{sale}\,|n\} = (1 - \Pr\{\text{out}\,|n\})(1-\alpha)\Pr\{G\,|n\}\,g$$

- Need to consider two different categories of consumers: those who left before reaching n* and those who left at n*

Effectiveness of Retargeting: α=0.3, g=0.1, b=0.5

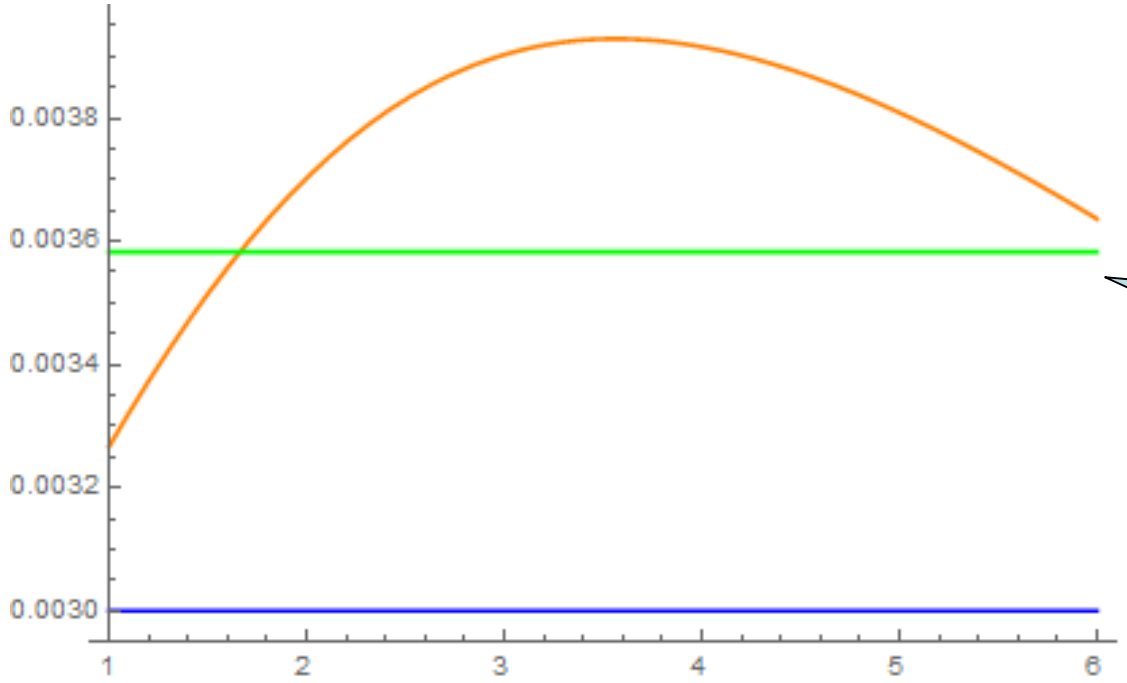


Targeting people with max products

Targeting people with min products

- The orange (blue) curve represents probability of sales for a retargeted (random) ad
  - The green curves is for n=n*=6

Effectiveness of Retargeting: α=0.9, g=0.1, b=0.5



Targeting people with max products

Targeting people with min products

- Optimal target now is n=4 (smaller than before with a higher risk of interruption)

Summary and Implications

- As the number of products browsed grows, the likelihood of a good seller-level match first increases and then decreases
- The consumer finds it optimal to switch to a different seller after looking at a certain number of products, and the seller often finds it optimal to retarget consumers who left before reaching this threshold
- A positive and significant likelihood of consumers being interrupted at search is the key for retargeting to be effective: “people are wildly distracted”

Thank You!