

# TARGETED ADVERTISING IN ELECTIONS

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## MOTIVATION

- ▶ **Targeted Advertising** was an important part of winning campaigns in recent U.S. Presidential Elections:
  - ◇ **2016 Trump**: used voter data from Cambridge Analytica
  - ◇ **2008 Obama**: first social media campaign
  - ◇ **2000 Bush**: targeting voters by mail

CAN TARGETED ADVERTISING SWING ELECTIONS? → Yes

## PREVIEW OF RESULTS

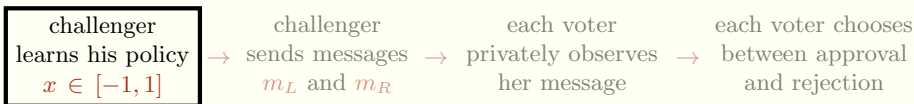
- ▶ some elections are unwinnable for challengers without targeted advertising
  - ◇ (pivotal) voters prefer policies on opposite sides of status quo
  - ◇ no public message convinces them to approve challenger's policy
- ▶ any such election can be won with targeted advertising
  - ◇ challenger makes each voter believe his policy is a sufficient improvement over status quo
  - ◇ challenger wins if his policy is sufficiently close to status quo
- ▶ if voters become more extreme, challenger's odds of winning increase

# BASILINE MODEL

# THE GAME

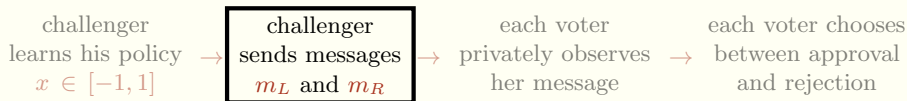
- ▶ policy space is  $X := [-1, 1]$ 
  - ◇ status quo policy is fixed, known, normalized to 0
- ▶ **players:**
  - ◇ challenger (he/him)
    - gets 1 if both voters approve his policy, 0 otherwise
  - ◇ voters  $L$  and  $R$  (she/her) with quadratic spatial preferences
    - choose to approve challenger's policy or reject it (keep status quo)
- ▶ **equilibrium concept:** challenger-preferred PBE
  - ◇ one that maximizes challenger's odds of winning

# INFORMATIONAL ASYMMETRY



- ▶  $x$  is drawn from a common atomless prior with full support
- ▶ **this talk:** prior is uniform on  $[-1, 1]$

# VERIFIABLE MESSAGES

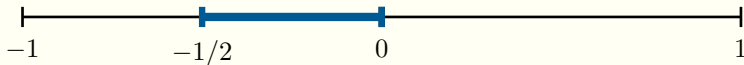


► challenger communicates with voters using verifiable messages

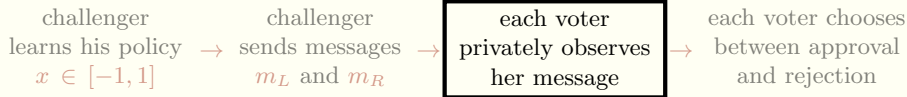
◇ each message  $m$

- is a statement about his policy:  $m \subseteq [-1, 1]$
- contains a grain of truth:  $x \in m$

► **example:**  $m = [-1/2, 0]$ , or “*my policy is moderately left*”



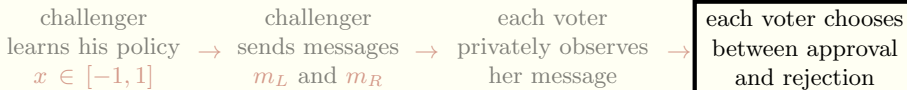
# BAYESIAN UPDATING



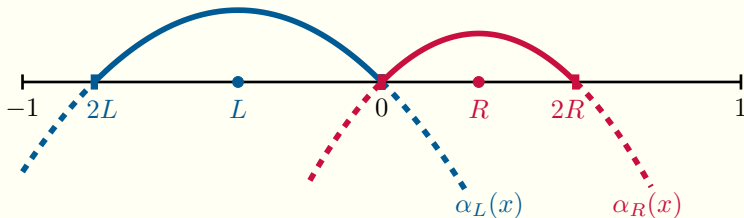
- ▶ each voter calculates posterior from prior, using challenger's strategy
  - ◇ voters do not condition on the event of being pivotal



# VOTERS' BEST RESPONSE



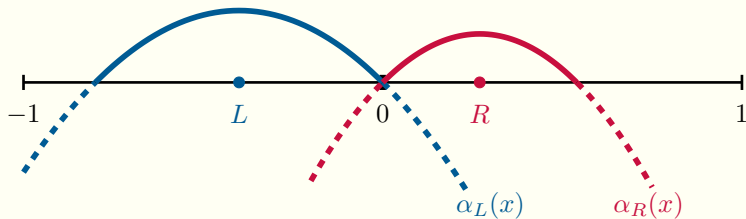
- ▶ voters have bliss points  $L < 0$  and  $R > 0$
- ▶ voter  $v \in \{L, R\}$  has **net payoff from approval**  $\alpha_v(x) := -(v - x)^2 + v^2$ 
  - ◇ approves if her (expected) net payoff from approval exceeds 0



# ANALYSIS

# UNWINNABLE ELECTION

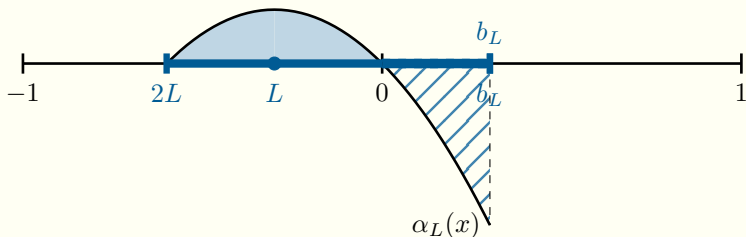
- **observation:**  $L$  and  $R$  never both approve if they hold a common belief



- **consequence:** election is unwinning without targeted advertising
- ◇ no advertising  $\rightarrow$  voters have common prior  $\rightarrow$  challenger loses
  - ◇ public advertising  $\rightarrow$  voters have common posterior  $\rightarrow$  challenger loses
  - ◇ targeted advertising  $\rightarrow$  voters have different posteriors  $\rightarrow \dots$

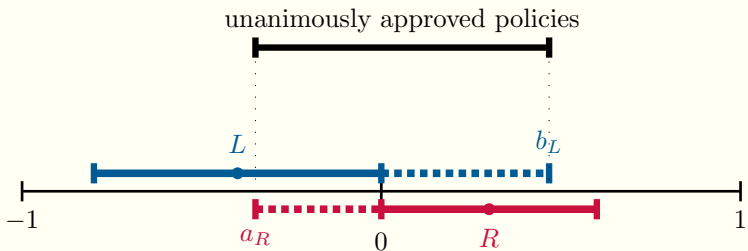
## TARGETED ADVERTISING: VOTER $L$

- ▶ challenger sends message  $[2L, b_L]$  whenever true, says nothing otherwise



- ▶ when voter  $L$  hears message  $[2L, b_L]$ 
    - ◇ she learns that challenger's policy is in  $[2L, b_L]$  but nothing more
    - ◇ her posterior belief is uniform on  $[2L, b_L]$
- select largest  $b_L$  so  $L$ 's expected net payoff from approval = 0

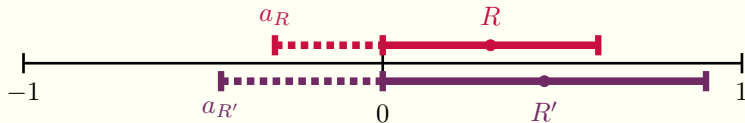
# TARGETED ADVERTISING: SOLUTION



- ▶ **main result:** with targeted advertising,
  - ◇ challenger wins if his policy is sufficiently close to status quo (in  $[a_R, b_L]$ )
  - ◇ his odds of winning are strictly positive (30%)
- ▶ *without targeted advertising, challenger's odds of winning are 0%*

# COMPARATIVE STATICS: MORE EXTREME VOTER

- ▶ **lemma:** voter becomes more persuadable as she moves away from 0
  - ◇ she becomes less satisfied with status quo



- ▶ **result:** if  $R$  increases,
  - ◇ challenger's equilibrium odds of winning increase
  - ◇ set of unanimously approved policies shifts to the left

# CONCLUSION

- ▶ some elections are unwinnable without targeted advertising
  - ◇ (pivotal) voters prefer policies on opposite sides of status quo
- ▶ any such election can be won with targeted advertising
  - ◇ challenger makes each voter believe his policy is sufficient improvement over status quo
  - ◇ challenger wins if his policy is not too far from status quo
- ▶ if voters become more extreme, challenger's odds of winning increase

**Thank You!**