Models from: The Democratic Dilemma

Can Citizens Learn What They Need to Know?

Can We Trust the Voters?

The proposition that [the people] are the best keeper of their liberties is not true. They are the worst conceivable, they are no keepers at all. They can neither act, judge, think, or will .

John Adams, 1788.

"Overall, close to a third of Americans can be categorized as "know-nothings" who are almost completely ignorant of relevant political information – which is not, by any means, to suggest that the other two-thirds are well informed…."

Critical Review 1999

Contemporary Evidence (Source: M-IS 1999)

- Which party had the most members in the House of Representatives before the last presidential election?
- What majority is required for the U.S. Senate to override a presidential veto -- 1/2+1, 3/5, 2/3 or 3/4?
- Which of the two major political parties is more conservative in general?
- How many members of the U.S Supreme Court are there?

Challenge

- Voters lack details.
- Inferences:
  - Common: Voter incompetence.
  - Recent: Voters adapt.
- When can people who lack information vote with competence?

Task and Tools

Task: Clarify the political consequences of limited information.

Tools:

- An exit poll.
- Game-theoretic models of communication & choice.*
- Laboratory experiments.
- Survey experiments.
- A comparison to other decision makers.

Definition

- I define competence with respect to a task.
  - How correct must you be?
- The task: make a binary choice.
- A voter is competent if:
  - She makes the same choice she would have made given different (e.g., more) information.

Direct Democracy

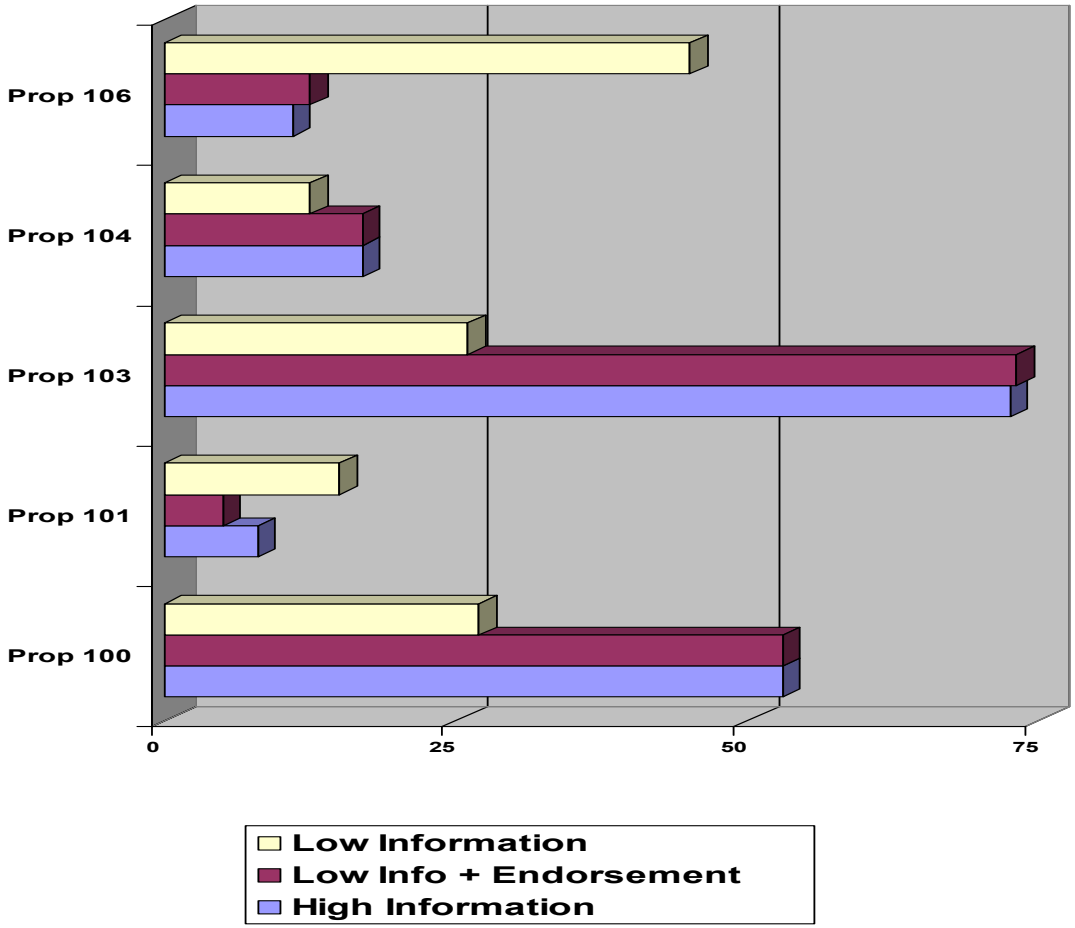
- Used in most democracies.
- Votes determine laws directly.
- Where's the party?
- "Candidates" have little history.
- High variance in
  - competition
  - quantity and quality of information

Example

- Q: Can badly informed voters use elite endorsements to emulate the behavior of better-informed voters?

- Background
  - High and fast increasing rates.
  - Industry anti-trust exempt.
  - Legislative stalemate.
  - Five competing initiatives.
  - Over $80 million spent.
  - Ralph Nader involved.

From Arthur Lupia. "Shortcuts versus Encyclopedias: Information and Voting Behavior in California Insurance Reform Elections." *American Political Science Review 88: 63-76.*



Implications

- Lack of details need not imply lack of competence.

- To come:

  – People choose “short cuts” in predictable ways.

  – Under what conditions do voters use short cuts effectively?

Who Believes Whom?

- Common explanations:
  - People are sheep.
  - Talk is cheap.
  - Certain attributes required.
    - E.g., heuristics
    - E.g., reputation, repetition

- Common assumptions
  - People know each other.
  - Stimulus/response paradigm.
  - Personal character is the key.
  - External forces do not matter.

Theoretical Premises

- An uncertain voter makes a binary choice.
- A speaker says “better” or “worse.”
  - He can lie.
- The voter is uncertain about the speaker’s interests and knowledge.
- External forces may be present.
  - Verification, Penalties for lying, Observable costly effort.

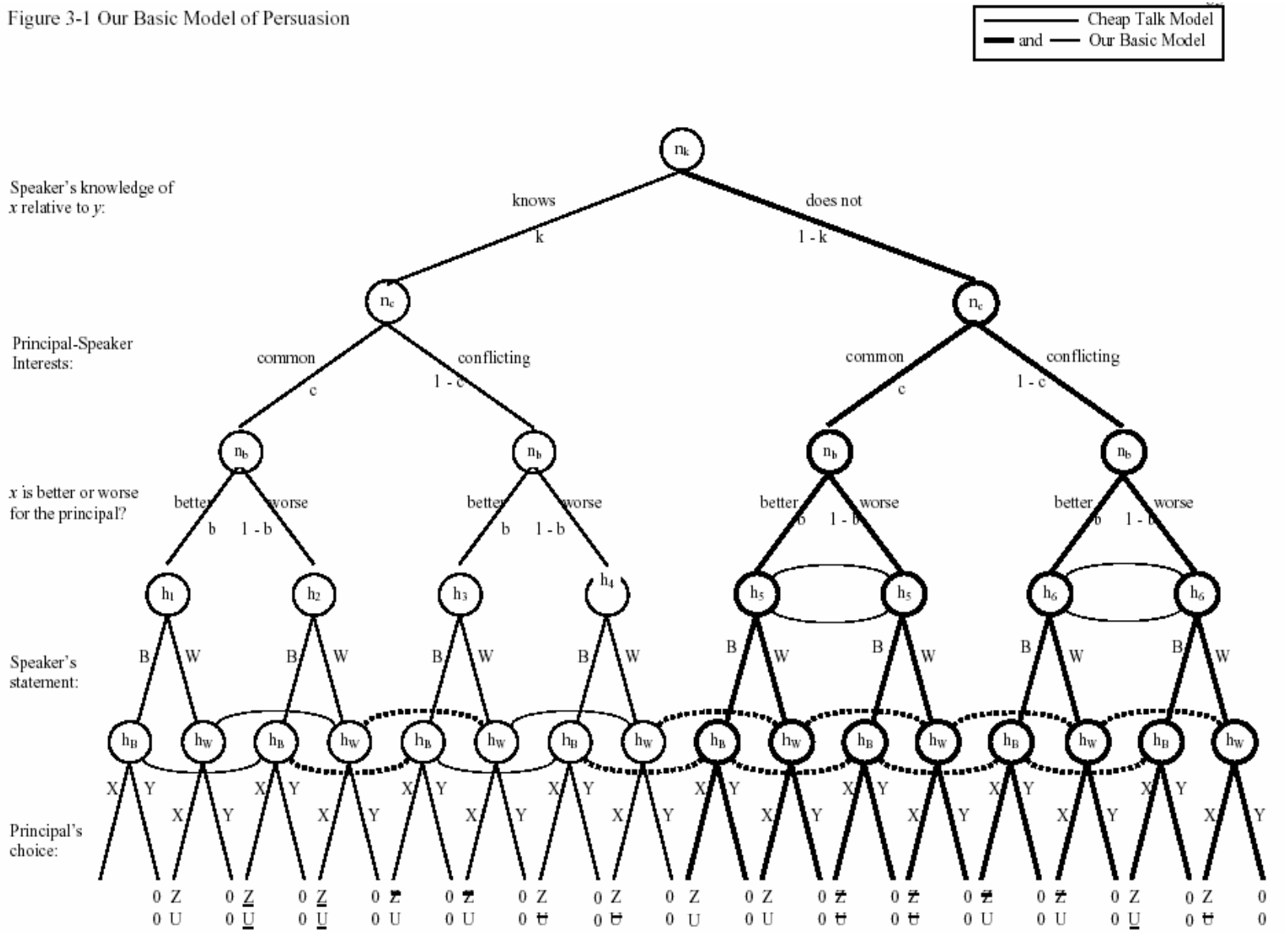
Model Intuitions

- Absent external forces, persuasion requires
  - perceived common interests and
  - perceived speaker knowledge.
- The model clarifies how external forces substitute for speaker attributes.
- Absent sufficient prior information, competence requires that the perceptions be correct.
  - Institutions can help.

Basic Model

- Two players: speaker and receiver.
- The receiver chooses *x* or *y*.
  - Her choice affects both players' utility.
- Sources of uncertainty.
  - Is *x* or *y* better for the receiver?
    - "better" prior: $b \in [0,1]$.
  - Do the speaker and receiver have common interests?
    - "common" prior: $c \in [0,1]$
  - Does the speaker have private information about x?
    - "knows" prior: $k \in [0,1]$

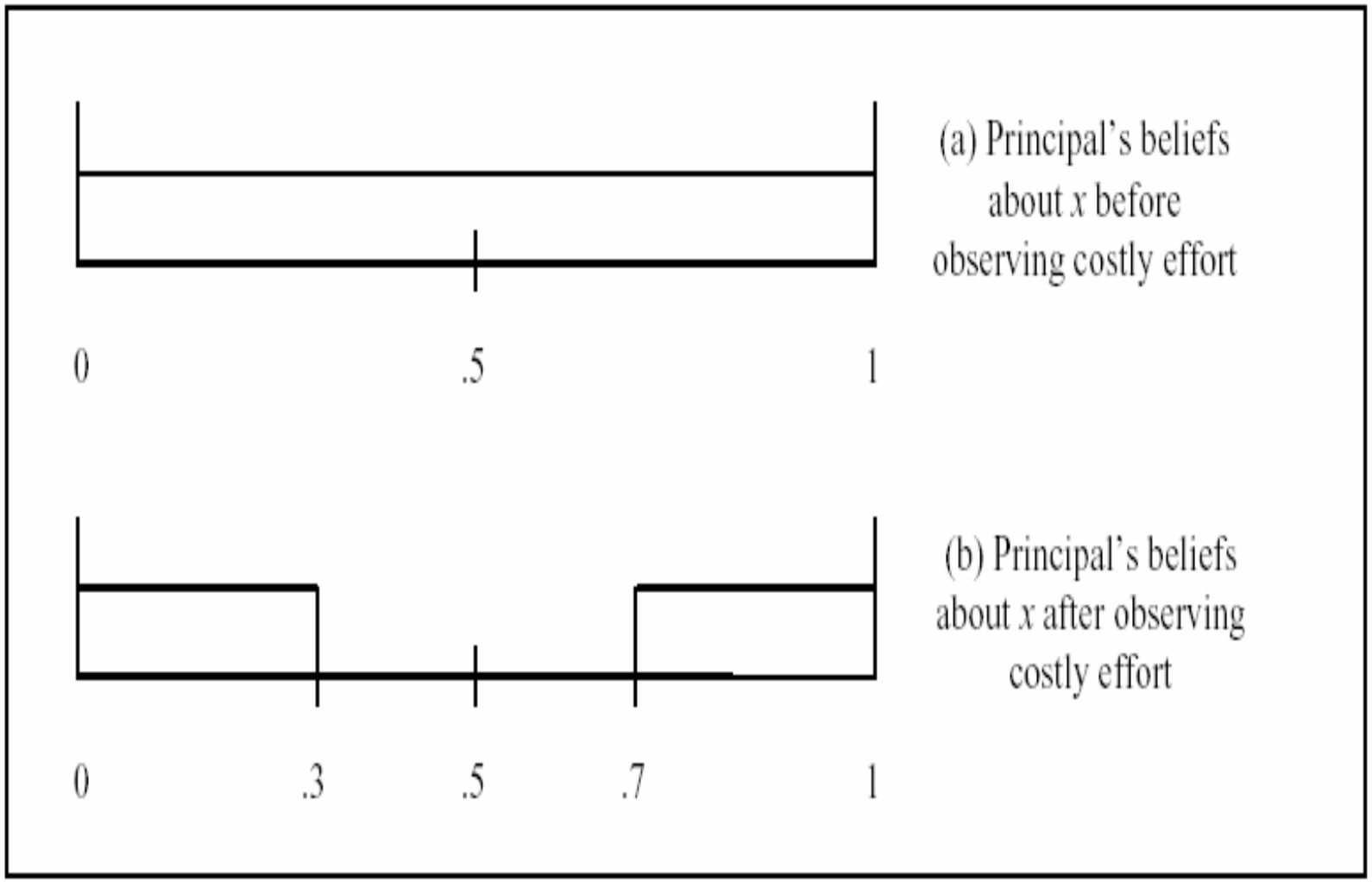
Figure 3-1 Our Basic Model of Persuasion



Extended Model

- Penalties for Lying
  - The speaker pays a penalty for making false statements.
- Verification
  - A fourth source of uncertainty emerges. With probability $v \in [0,1]$, Nature replaces the speaker's signal with the true signal.
- Costly effort
  - The speaker must pay a positive cost to say anything.
- Each exogenous force's impact on communication strategies and outcomes is determined endogenously.

Figure 3-2 The Effect of Costly Action



Equilibrium Criteria

- Equilibrium concept: sequential.
- Our restriction on off-path beliefs:
  - "if the principal is at a zero-probability information set, then she ignores the speaker's signal."
- Focus on non-neologisms.

Model Intuitions

- Absent external forces, persuasion requires
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- The model clarifies how external forces substitute for speaker attributes.
- Absent sufficient prior information, competence requires that the perceptions be correct.
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Table 3-1
Numerical Examples

Example	c = prior probability of common interests	k = prior probability that the speaker is knowledgeable	b = prior probability that x is better	Persuasion if the speaker says better, in equilibrium
Example 1				
case 1	.8	.7	.35	Yes
case 2	*.49*	.7	.35	No
case 3	.8	*0*	.35	No
case 4	.8	.7	*.35*	No
Example 2				
case 1	1	.5	.4	Yes
case 2	*.49*	.5	.4	No
case 3	1	*0*	.4	No
case 4	1	.5	*.1*	No

Definition:

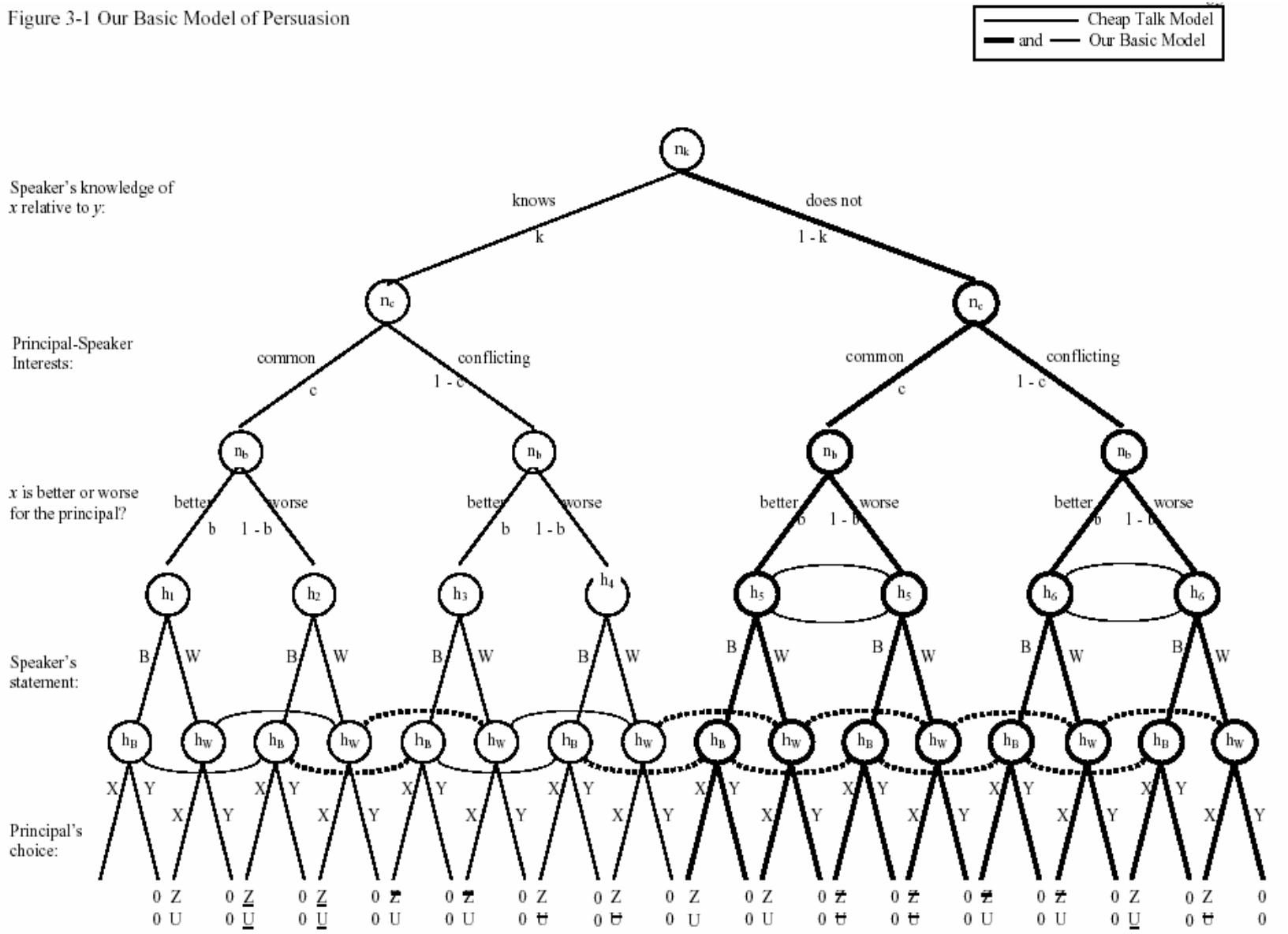
A pair of strategy profiles (π_r, π_s) is a *sequential equilibrium* if:

(a) For each h_s, $\pi_s(s; h_s)$ maximizes expected speaker utility given $\pi_r(x; s)$ for all $s \in \{B, W\}$.

(b) For each s that is along the path of play, $\pi_r(x; s)$ maximizes the principal's expected utility given $\mu(better|s)$ and $\mu(worse|s)$, where μ is computed from π_s by Bayes' rule.

(c) For any s that is not along the path of play, $\pi_r(x; s)$ maximizes expected principal utility given $\mu(better|s)=b$ and $\mu(worse|s)=1-b$.

Figure 3-1 Our Basic Model of Persuasion



Proposition 3- 1

The only non-babbling, non-neologistic SE in the basic model is:

$\pi_{14} = (1, 0, 0, 1)$;

A "common" speaker tells the truth. A "conflicting" speaker lies.

$\pi_5 = 1$; if $bZ + (1-b)\underline{Z} \geq 0$ and $\pi_5 = 0$ otherwise.

$\pi_6 = 1$; if $b\underline{Z} + (1-b)Z \geq 0$ and $\pi_6 = 0$ otherwise.

Non-expert speaker says what he thinks will induce his preferred outcome.

$\pi_r = (1,0)$; $\pi_r = (\pi_r(x;B), \pi_r(x;W))$.

The receiver believes the signal.

Prop 3-1 (cont.)

This equilibrium requires Condition A:

$$\underline{[(1-c)k + [(1-k) \times [\pi_s(B; h_5)c + \pi_s(B; h_6)(1-c)]]]} \leq bU/(b-1)\underline{U}$$
$$[ck + [(1-k) \times [\pi_s(B; h_5)c + \pi_s(B; h_6)(1-c)]]]$$

and Condition B:

$$\underline{[ck + [(1-k) \times [(1-\pi_s(B; h_5))c + (1-\pi_s(B; h_6))(1-c)]]]} \geq bU/(b-1)\underline{U}$$
$$[(1-c)k + [(1-k) \times [(1-\pi_s(B; h_5))c + (1-\pi_s(B; h_6))(1-c)]]],$$

where at least one of the inequalities is strict.

Structure of Proof

- Define the expected value of every pure strategy at every speaker information set.
- Identify the boundaries of the set of potential non-babbling, non-neologistic sequential equilibria.
- Identify the sequentially rational strategy profiles within this set. We find that the named equilibrium is this set's only member.
- Evaluate the consistency of the SR strategy profiles.

Step 1. Expected values

- Let $Z>0>\underline{Z}$.
- At h_1, the expected utility from $\pi_s(B;h_1)=1$ is $\pi_r(x;B)Z$. The expected utility from $\pi_s(B;h_1)=0$ is $\pi_r(x;W)Z$. If $\pi_r(x;B) \geq \pi_r(x;W)$, then $\pi_s(B;h_1)=1$ is the best response.
- At h_2, the expected utility from $\pi_s(W;h_2)=1$ is $\pi_r(x;B)\underline{Z}$. The expected utility from $\pi_s(W;h_2)=0$ is $\pi_r(x;W)\underline{Z}$. If $\pi_r(x;B) \geq \pi_r(x;W)$, then $\pi_s(B;h_2)=0$ is the best response.
- At h_3, the expected utility from $\pi_s(B;h_3)=1$ is $\pi_r(x;B)\underline{Z}$. The expected utility from $\pi_s(B;h_3)=0$ is $\pi_r(x;W)\underline{Z}$. If $\pi_r(x;B) \geq \pi_r(x;W)$, then $\pi_s(B;h_3)=0$ is the best response. …

Lemma 1: All mixed strategy sequential equilibria in the model are babbling equilibria.

Proof : A mixed strategy equilibrium requires that each player choose a strategy that makes the other player indifferent between their two pure strategies.

A necessary and sufficient condition for rendering the speaker indifferent between his pure strategies at information sets h_1 through h_4 is to set $\pi_r(x;B)=\pi_r(x;W)$.

Setting $\pi_r(x;B)=\pi_r(x;W)$ is also necessary and sufficient to make the speaker indifferent between her two strategies at h_5 if $bZ + (1\text{-}b)\underline{Z} \neq 0$ and at h_6 if $b\underline{Z} + (1\text{-}b)Z \neq 0$.

Setting $\pi_r(x;B)=\pi_r(x;W)$ implies that the principal is not conditioning her strategy on the signal.

Anticipating such behavior, the speaker can choose any strategy he likes.

These speaker strategies will either make the principal indifferent between her pure strategies, in which case we have a babbling equilibrium, or they will not, in which case we do not have an equilibrium.

•

- If $bZ + (1-b)\underline{Z} = 0$ or $b\underline{Z} + (1-b)Z = 0$, then any principal strategy, including $\pi_r(x;B)=\pi_r(x;W)$ makes the speakers at h_5 and h_6 indifferent.
- Note, however, the receiver has an incentive to choose a mixed strategy other than $0 < \pi_r(x;B)=\pi_r(x;W) < 1$ only if she can induce the speaker at h_5 and h_6 to take distinct and knowledge transferring actions.
- Since the speaker at h_5 and h_6 has no useful private information at either of these information sets, by definition, the requirement cannot be met.
- Therefore, only equilibria that could result from such an adaptation is a babbling equilibrium. *QED*.

Step 2. Continued

- It follows that all equilibria for which $\pi_r(x;B)=\pi_r(x;W)$ are babbling equilibria.
- Moreover, any non-babbling equilibrium for which $\pi_r(x;B)=0$ and $\pi_r(x;W)=1$ requires neologisms (i.e., both players know that *B* means *worse* and *W* means *better*.) Therefore, non-babbling, non-neologistic sequential equilibria must include $\pi_r=(1,0)$.
- Since non-babbling, non-neologistic sequential equilibria must include $\pi_r=(1,0)$, they must also include $\pi_{14}=(1,0,0,1)$.
- The reason for this is that the expected speaker utility at h_1 through h_4 reveal $\pi_{14}=(1,0,0,1)$ to be the unique profile of best responses when $\pi_r(x;B)>\pi_r(x;W)$.
- Therefore, the set of non-babbling, non-neologistic sequential equilibria must be contained *within* $\pi=(1,0,0,1,\{0,1\},\{0,1\};1,0)$, where {0,1} within strategy profile π is read as "either *0* or *1*."

Step 3.

- At h_W, the expected utility from $\pi_r(x;W)=1$ is
- $[ckb(1-\pi_s(B;h_1))U + ck(1-b)(1-\pi_s(B;h_2))\underline{U} + (1-c)kb(1-\pi_s(B;h_3))U + (1-c)k(1-b)(1-\pi_s(B;h_4))\underline{U} +$
- $c(1-k)b(1-\pi_s(B;h_5))U + c(1-k)(1-b)(1-\pi_s(B;h_5))\underline{U} + (1-c)(1-k)b(1-\pi_s(B;h_6))U + (1-c)(1-k)(1-b)(1-\pi_s(B;h_6))\underline{U}] / [ckb(1-\pi_s(B;h_1)) + ck(1-b)(1-\pi_s(B;h_2)) + (1-c)kb(1-\pi_s(B;h_3)) + (1-c)k(1-b)(1-\pi_s(B;h_4)) +$
- $c(1-k)b(1-\pi_s(B;h_5)) + c(1-k)(1-b)(1-\pi_s(B;h_5)) + (1-c)(1-k)b(1-\pi_s(B;h_6)) + (1-c)(1-k)(1-b)(1-\pi_s(B;h_6))]$

- Recall that the principal earns utility zero for choosing *y*.
  - Therefore, $\pi_r(x;B)=1$ is the best response only if the expected utility from $\pi_r(x;B)=1$ is ≥ 0 and $\pi_r(x;W)=0$ is a best response only if the expected utility from $\pi_r(x;W)=1$ is ≤ 0.
-

Step 3 continued: R's response.

- $\pi = (1, 0, 0, 1, 0, 0, 1, 0)$ is a SE because the expected utility at information sets h_5 and h_6, we know that this equilibrium holds only if $bZ + (1-b)\underline{Z} \leq 0$ and $b\underline{Z} + (1-b)Z \leq 0$.

- This equilibrium requires the expected utility of $\pi_r(x;B)=1 \geq 0 \geq$ the expected utility of $\pi_r(x;W)=1$. We evaluate these conditions below.

- If $\pi_s = (1, 0, 0, 1, 0, 0)$, then the numerator of the expected utility from $\pi_r(x;W)=1$ reduces to: $ck(1-b)\underline{U} + (1-c)kbU + c(1-k)bU + c(1-k)(1-b)\underline{U} + (1-c)(1-k)bU + (1-c)(1-k)(1-b)\underline{U}$. Since the denominator of this expected utility is >0, by definition, it is trivial to show that this quantity is ≤ 0 iff $[1 - k + ck]/[1 - ck] \geq bU/(b-1)\underline{U}$, which is true iff Condition B is true.
- Similarly, if $\pi_s = (1, 0, 0, 1, 0, 0)$, then the expected utility from $\pi_r(x;B)=1$ reduces to: $ckbU + (1-c)k(1-b)\underline{U}$. It is trivial to show that this quantity is ≥ 0 iff $bU/(b-1)\underline{U} \geq [1-c]/c$, which is true iff Condition A is true. Therefore, $\pi = (1, 0, 0, 1, 0, 0, 1, 0)$ is sequentially rational under the conditions that we specify in Proposition 3-1.

T3-1: The equilibrium in Proposition 3-1 exists only if $c>.5$.

- For notational simplicity, let $f = [(1-k)\times[\pi_s(B; h_5)c + \pi_s(B; h_6)(1-c)]]$ and let $g = [(1-k) \times[(1- \pi_s(B; h_5))c + (1- \pi_s(B; h_6))(1-c)]]$.
- A NC for the satisfaction of Proposition 3-1 is that Conditions A and B hold.
- A NC for A and B to hold is that $(k- ck +f)/(ck + f) \leq (ck + g)/(k - ck + g)$.
- Multiplying each side of the inequality by its denominator and dividing everything by k, which requires $k > 0$, produces $k + f + g \leq 2ck + 2fc + 2gc$.
- Dividing each side of the inequality by $2k + 2f +2 g$ produces the requirement that $c>.5$.

Theorem 3-2

- The equilibrium in Proposition 3-1 exists only if $k>0$.
- **Proof:**
- If $k=0$, then both the expected utility from $\pi_r(x;B)=1$ and the expected utility from $\pi_r(x;W)=1$ equal 0. Therefore, neither of the above mentioned inequalities can be strict. **QED.**

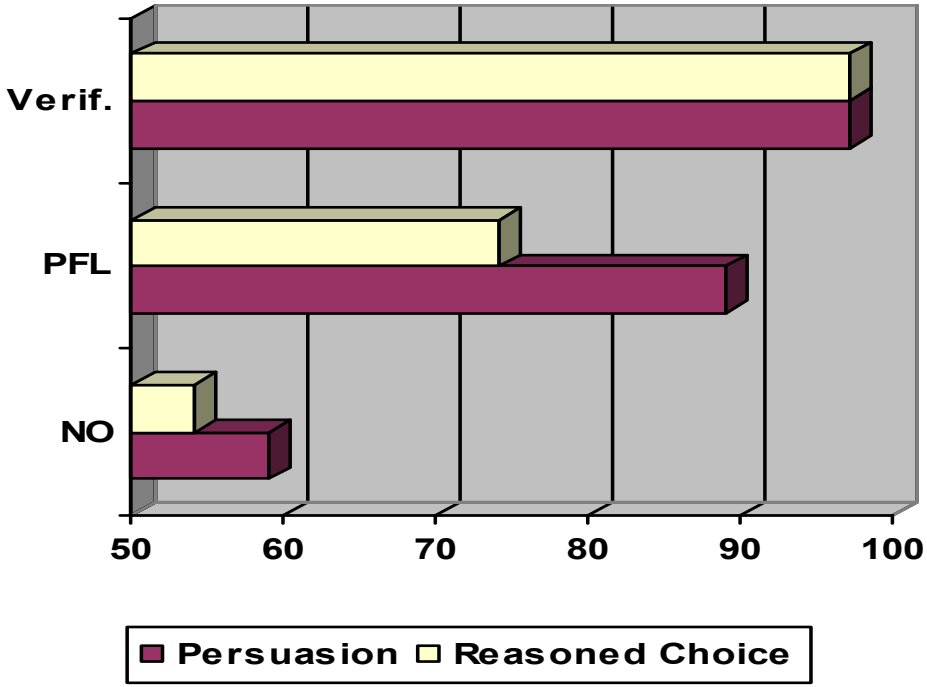
Lab Experiments

- A subject is a voter or advisor.
- The voter predicts coin tosses
  - Earns $1/correct prediction.
- Advisor: “heads” or “tails.”
  - we vary perceptions:
    - hidden die rolls determine speaker interests & knowledge.
  - we vary “institutions.”
    - penalties for lying, costly effort, verification present in selected trials.

First Trials

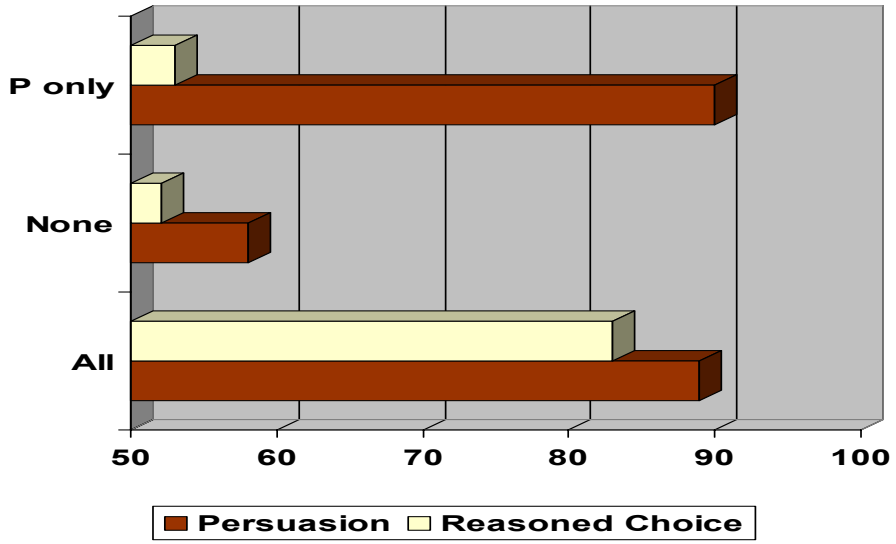
- Complete information.
- Incomplete information.
  - No advice.
- Incomplete information.
  - Advisor is paid for your success.
- Incomplete information.
  - Advisor is paid for your failure.

From Arthur Lupia and Mathew D. McCubbins.
The Democratic Dilemma: Can Citizens Learn What They Need to Know? Ch 7.
New York: Cambridge University Press.



With sufficient penalty for lying or verification, we expect persuasion and reasoned choice. Otherwise, we do not.

From Arthur Lupia and Mathew D. McCubbins.
Elements of Reason: Cognition, Choice and the Bounds of Rationality. Ch. 3.
New York: Cambridge University Press.



- **All:** Trials where model predicts persuasion and reasoned choice.
- **None:** Model predicts none of the above.
- **P only:** Model predicts persuasion only.

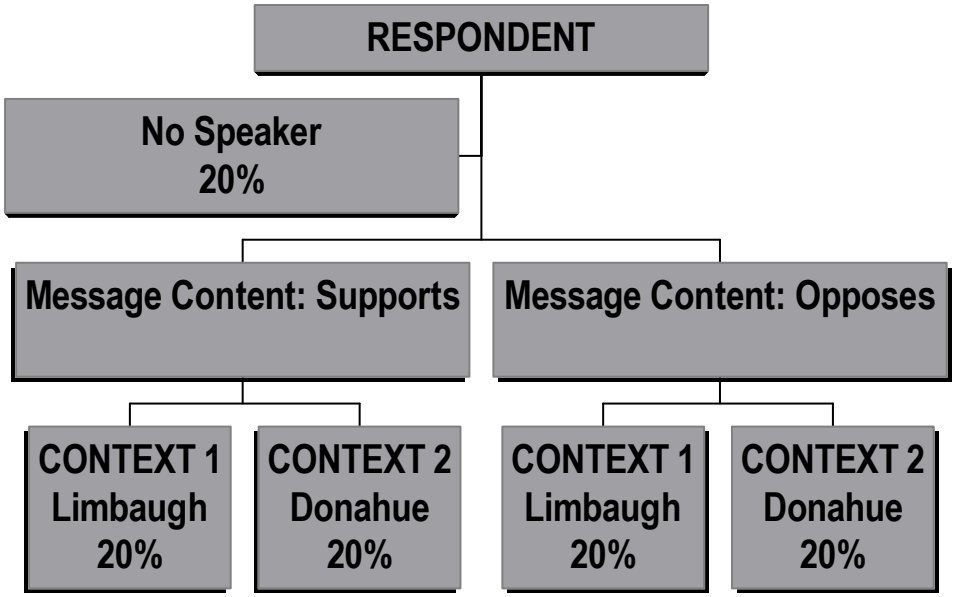
CATI Experiment N=1464

- "... talk show host [SENDER] [POSITION] spending money to build more prisons. What do you think? Is spending money to build prisons a good idea or a bad idea?"

- "How much would you say that [SENDER] knows about what will happen if this country spends money to build more prisons -- a lot, some, a little, or nothing?"

- "On most political issues would you say that you and [SENDER] agree all of the time, most of the time, only some of the time, or never?"

Random Selection



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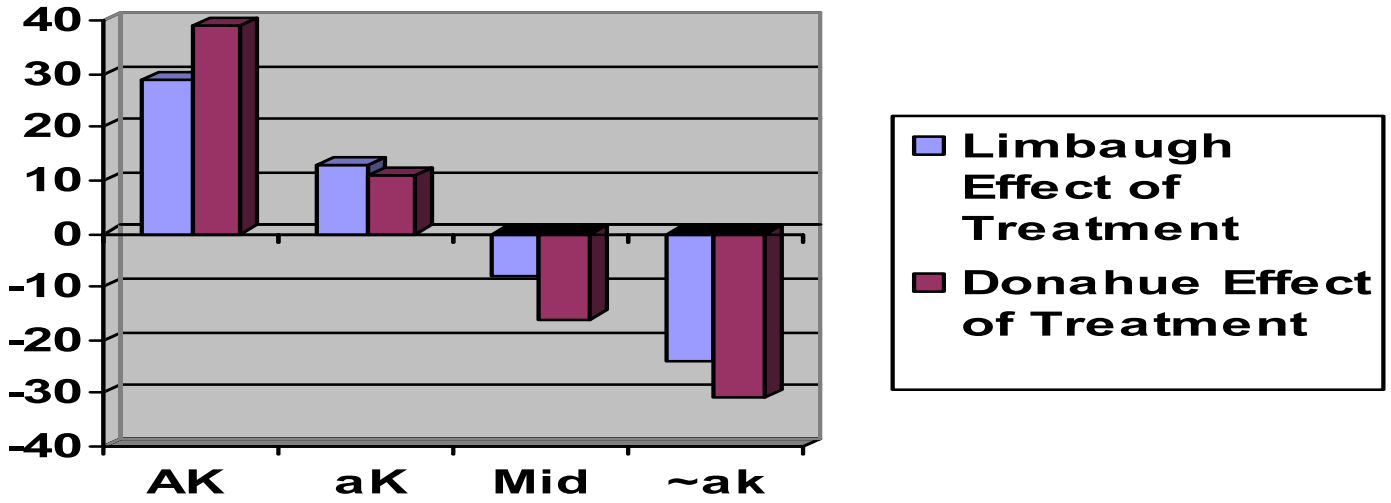
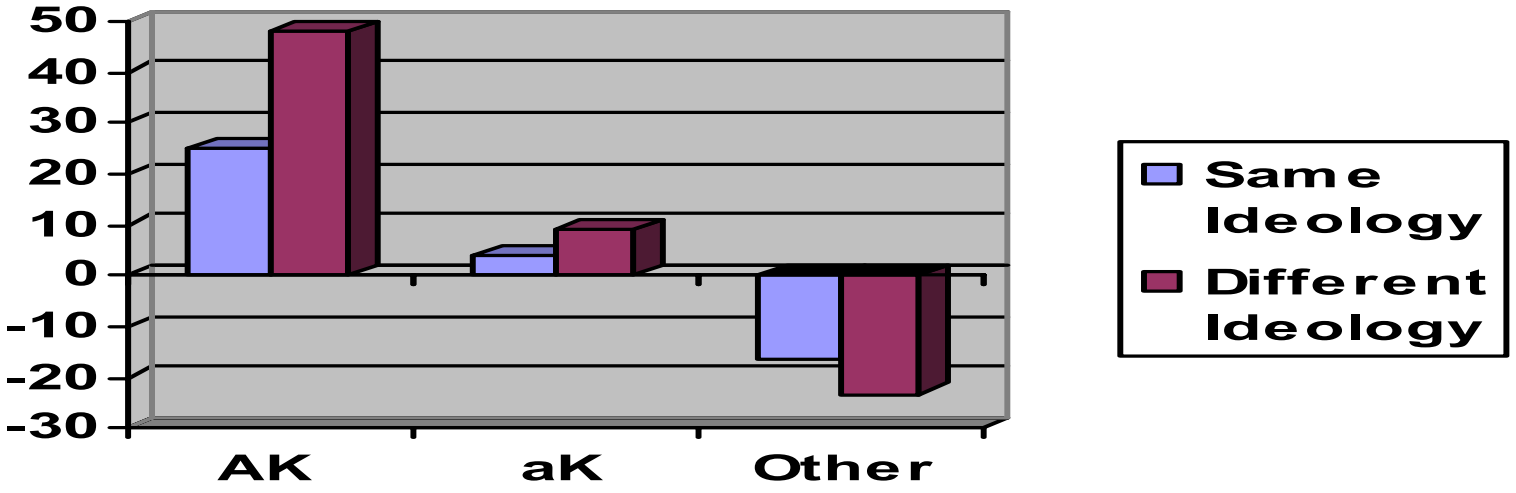


- Metric: (%Yes|Heard Supports) - (%No|Heard Supports)

- L to R: declining perceptions of trust and knowledge (K>k); we expect declining effects.

Just Ideology?



- Factors such as ideology depend on perceived agreement and knowledge. *The converse is not true.*

- Perceived knowledge & trust are <u>the</u> fundamental source effects.

Comparison

- Legislators are professional.
- Legislatures
  - Consider 100's or 1000's of bills.
  - Delegate fact-finding and agenda control to committees who, in turn, delegate these tasks to civil servants and experts.
- On most bills, most legislators base their choices on short cuts.

Implications

- Citizens process political information in systematic ways. Strategic considerations matter.

- People can choose competently despite lacking details.
  - True in a range of experimental environments.
  - Would electoral outcomes be different today?

- Results imply different solutions.
  - Circulate endorsement information.
  - Make it easier to "follow the money."
  - Complexity increases requirements.

Epilogue

- Which mechanisms are necessary/sufficient to increase targeted competence?

- To enhance competence, an utterance must win:
  - The battle of attention.
    - Stimulus X versus all other stimuli.
  - The battle of recall.
    - Attended X versus all other icons in memory.
  - Battles at the precipice of choice.
    - Recalled X versus embodied routine.