

# Communication as a Science

Arthur Lupia, Hal R Varian Collegiate Professor

# • Low-information elections • Coalition bargaining

assumptions of this model into the Bayes-Nash statement. Let  $\bar{M}$  denote the message space which is  $\{0, 1\}$  times the space defined in Table 2.

$\forall (k, j) \in \bar{M}$ , let  $A(k, j) = \{X: s_1 = k, \text{ and } M_2(s_2) = j\}$  be the set of all setter types that send message  $M(s, X) = (k, j)$ .

In a Bayes-Nash equilibrium,  $\forall X \in [0, 1]$ , the setter chooses  $s \in \{0, 1\} \times [0, 1]$  to maximize

$$\phi(s, v_1, \dots, v_n | X, T_1, \dots, T_n),$$

and each voter  $i \in N$  and  $T_i \in [0, 1]$  chooses  $v_i(T_i)$  to maximize

$$\int U_i(o(s_2, v_i(T_i, M(s, X)), v_{-i}(T_{-i}, M(s, X))), T_i]$$

$dF(X) dG(T_{-i})$ .

The first difference between our equilibrium concept and Bayes-Nash is that we assume that voters always vote as if they are the pivotal voters (i.e., they adopt strategies that are weakly dominant with respect to the strategies of other voters); that is,  $v_i^* \in S_i$  is weakly dominant if

$$\forall v_i \in S_i, v_{-i} \in S_{-i}, s \in S_0, T_i \in [0, 1], \text{ and } T_{-i} \in [0, 1]^{n-1}$$

$$\int U_i(o(s_2, v_i(T_i, M(s, X)), v_{-i}(T_{-i}, M(s, X))), T_i] \geq \int U_i(o(s_2, v_i(T_i, M(s, X)), v_{-i}(T_{-i}, M(s, X))), T_i],$$

with strict inequality for some  $T_i, T_{-i}, v_{-i}$ , and  $s$ . If  $v_i^*$  is dominant, it must be the case that

$$\int U_i(o(s_2, v_i(T_i, M(s, X)), v_{-i}(T_{-i}, M(s, X))), T_i]$$

$$dF(X) \geq \int U_i(o(s_2, v_i(T_i, M(s, X)),$$

$$v_{-i}(T_{-i}, M(s, X))), T_i) dF(X),$$

with sometimes strict inequality, which implies

$$\sum_{(j,k) \in \bar{M}} \int_{A(j,k)} U_i(o(s_2, v_i(T_i, j, k), v_{-i}(T_{-i}, j, k)),$$

$$T_i) dF(X) \geq \sum_{(j,k) \in \bar{M}} \int_{A(j,k)} U_i(o(s_2, v_i(T_i, j, k), v_{-i}(T_{-i}, j, k)),$$

$$(T_{-i}, j, k), T_i) dF(X).$$

Note that for all  $v_{-i} \in S_{-i}$  and  $T_{-i} \in [0, 1]^{n-1}$ , I can only affect the outcome of the election if

$$\sum_{i \in \{N-1\}} v_i(T_i, (j, k)) \in \{0, 1\}.$$

In this case

$$o(s, v_i(T_i, M(j, k)), v_{-i}(T_{-i}, M(j, k)))$$

$$= \begin{cases} s_2 & \text{if } v_i = 1 \\ SQ & \text{if } v_i = -1. \end{cases}$$

Hence

$$v_i =$$

$$1 \text{ if } \int_{A(j,k)} U_i(s_2, T_i) dF(X) > \int_{A(j,k)} U_i(SQ, T_i) dF(X)$$

$$-1 \text{ if } \int_{A(j,k)} U_i(s_2, T_i) dF(X) \leq \int_{A(j,k)} U_i(SQ, T_i) dF(X)$$

is a dominant strategy for voter  $i$ . But  $v_i$  can be rewritten as

$$v_i =$$

$$\begin{cases} 1 & \text{if } \int_{A(j,k)} U_i(s, T_i) dF(X) > U_i(SQ, T_i) \int_{A(j,k)} dF(X) \\ -1 & \text{if } \int_{A(j,k)} U_i(s, T_i) dF(X) \leq U_i(SQ, T_i) \int_{A(j,k)} dF(X) \end{cases}$$

$$v_i = \begin{cases} 1 & \text{if } \int_0^1 U_i(s, T_i) dF(X | j, k) > U_i(SQ, T_i) \\ -1 & \text{if } \int_0^1 U_i(s, T_i) dF(X | j, k) \leq U_i(SQ, T_i), \end{cases}$$

where

$$f(X | k, j) = \begin{cases} \frac{f(X)}{\text{pr}(k, j)} & \text{if } X \in A(k, j) \\ 0 & \text{otherwise.} \end{cases}$$

I can therefore restate the equilibrium concept for the direct legislation model (which is now more similar to the sequential equilibrium concept of Kreps and Wilson 1982 than Bayes-Nash) as a set of strategies  $s \in S_0, v_i \in S_i$ , and voter beliefs  $f(X | k, j)$ , such that for each  $(k, j) \in \bar{M}$ ,

SETTER  $\forall X, s = (s_1, s_2)$  satisfies  $\max_{s \in \{0,1\} \times \{0,1\}}$

$$[U_i(o(s_2, v_i(T_i, M(s, X))), \dots,$$

$$v_n(T_n, M(s, X)), X) - (K \times s_1)].$$

VOTERS  $\forall T_i, (i \in N)$ , and  $\forall (k, j) \in \bar{M}, v_i(T_i, k, j)$

satisfies

$$v_i = 1 \text{ if } \int_0^1 U_i(s_2, T_i) dF(X | k, j) > U_i(SQ, T_i)$$

$$v_i = -1 \text{ otherwise.}$$

LEMMA 10. If the consequence of the first party's failure to make an acceptable offer is a coalition between the second and out-parties made under the threat of an election, then

Additional Contingency	First's Offer	Result
$\left(1 - \frac{b_1 - E_2 - s_1}{g_1^2}\right) g_1^2 > \left(1 - \frac{b_1 - E_2 - s_1}{g_2^2}\right) g_2^2 - K_2$		
$\left(1 - \frac{b_1 - E_2 - s_1}{g_1^2}\right) g_1^2 \geq K_1$	$\frac{b_1 - E_2 - s_1}{g_1^2}$	first and out coalesce
$\left(1 - \frac{b_1 - E_2 - s_1}{g_1^2}\right) g_1^2 \geq \max\left[\left(1 - \frac{b_1 - E_2 - s_1}{g_2^2}\right) g_2^2, K_1\right]$	$\left(1 - \frac{b_1 - E_2 - s_1}{g_2^2}\right) g_2^2 - K_2$	first and second redistribute
$K_1 > \max\left[\left(1 - \frac{b_1 - E_2 - s_1}{g_1^2}\right) g_1^2, \left(1 - \frac{b_1 - E_2 - s_1}{g_2^2}\right) g_2^2\right]$	none	second and out coalesce

LEMMA 11. If the consequence of the first party's failure to make an acceptable offer is a coalition between the second and out-parties made under the threat of the status quo, then

Additional Contingency	First's Offer	Result
$(1 - e) g_1^2 > \left(1 - \frac{(1 - e) g_1^2 - K_2}{g_2^2}\right) g_2^2$ and $(1 - e) g_1^2 \geq K_1$	$e$	first and out coalesce
$\left(1 - \frac{(1 - e) g_2^2 - K_2}{g_2^2}\right) g_2^2 \geq \max[(1 - e) g_1^2, K_1]$	$\frac{(1 - e) g_2^2 - K_2}{g_2^2}$	first and second redistribute
$K_1 > \max\left[\left(1 - \frac{(1 - e) g_2^2 - K_2}{g_2^2}\right) g_2^2, (1 - e) g_1^2\right]$	none	second and out coalesce

LEMMA 12. If the consequence of the first party's failure to make an acceptable offer is the status quo, then

Additional Contingency	First's Offer	Result
$(1 - e) g_1^2 - K_1 > c_1 g_2^2$	$e$	first and out coalesce
$c_1 g_2^2 \leq (1 - e) g_1^2 - K_1$	none	status quo

## Formal Statements of Conditions A, B, and C

CONDITION A. There exists a majority that prefers an election to the status quo.

$$(s_1 + s_2 > .5 \text{ and } b_1 - E_1 > s_1 + c_1 g_1^2 \text{ and } b_2 - E_2 > s_2 + c_2 g_2^2)$$

or

$$(s_1 + s_2 > .5 \text{ and } b_1 - E_1 > s_1 + c_1 g_1^2 \text{ and } b_2 - E_2 > s_2)$$

or

$$(s_2 + s_2 > .5 \text{ and } b_2 - E_2 > s_2 + c_2 g_2^2 \text{ and } b_1 - E_1 > s_1).$$

CONDITION B. Offering parties prefer an election to the best acceptable offer they can make.

$$b_1 - E_1 > \max\left[s_1 + \left(1 - \frac{b_1 - E_1 - s_1}{g_1^2}\right) g_1^2 - K_1, s_1 + \left(1 - \frac{b_1 - E_1 - s_1}{g_2^2}\right) g_2^2 - K_1\right],$$

where

$$\frac{b_1 - E_1 - s_1}{g_1^2}$$

is the minimum offer that party  $i$  will accept from party  $j$  under the threat of an election.

CONDITION C. No offering party prefers the best acceptable offer it can make to the status quo.

$$(1 - e) g_2^2 - K_2 \leq c_2 g_2^2 \text{ and } (1 - e) g_1^2 - K_1 \leq c_1 g_1^2,$$

where  $e > 0$  is very small.

Proof of Theorem 1. Notice that the only conditions under which the event can lead to dissolution are specified in Lemma 8. Conditions A and B specify the full set of such conditions.

Now suppose that dissolution does not necessitate A. Since at least one set of two parties must have enough seats to constitute a majority, not A implies that neither

$$(b_1 - E_1 > s_1 + c_1 g_1^2 \text{ and } b_2 - E_2 > s_2 + c_2 g_2^2)$$

nor

$$(b_1 - E_1 > s_1 + c_1 g_1^2 \text{ and } b_2 - E_2 > s_2)$$

nor

$$(b_2 - E_2 > s_2 + c_2 g_2^2 \text{ and } b_1 - E_1 > s_1).$$

Thus, if not A, then there exists no majority that prefers an election to the status quo. Since a majority is required to defeat the vote of confidence and since a defeated vote of confidence is required for dissolution, dissolution necessitates A.

# What Unites Us?

- Goal: Inform the public
- Means: Education/exposure
- Theory:
  - “If we tell them what we know, they will change how they think and what they do.”

# Opportunity Awaits...



# A Common Result



© 2010 Arthur Lupia

# An explanation...

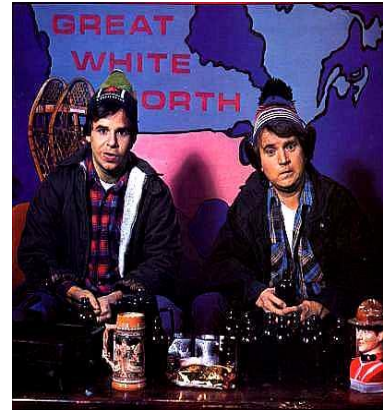


# A Walk in the Woods

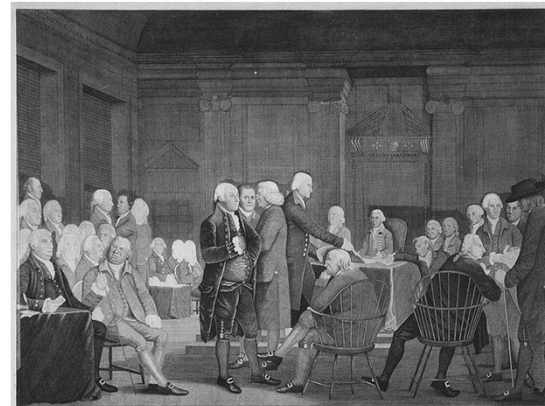


# The Problem is Us

- We misunderstand how “they” make decisions



- We are mistaken *how and when* “we” can persuade.





# Progress Guidelines

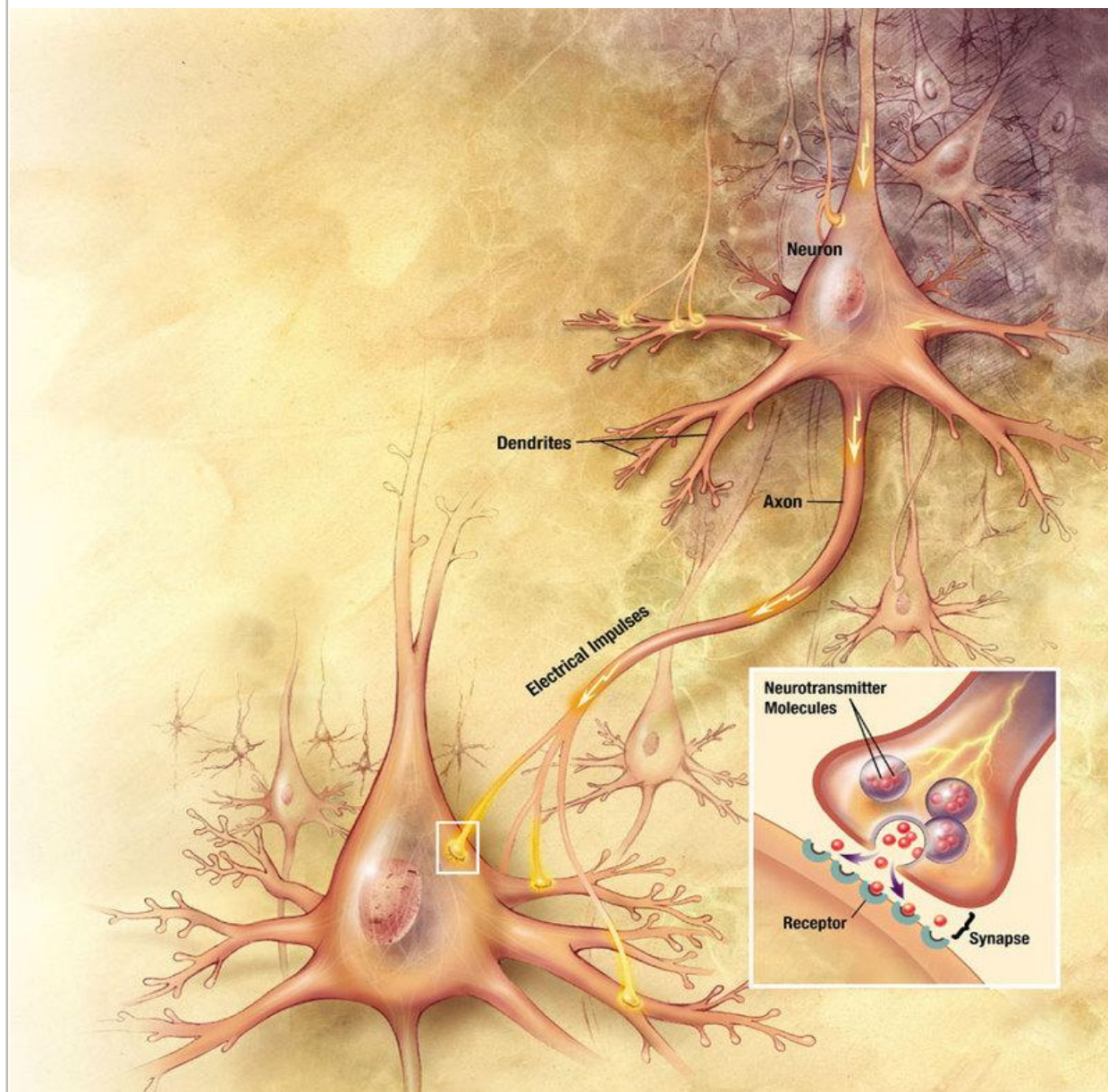
- **Biology** defines possibilities.
- **Social scientific studies of persuasion** reveal requirements for success.

# Necessary Conditions for Persuasion

# Persuasion (definition)

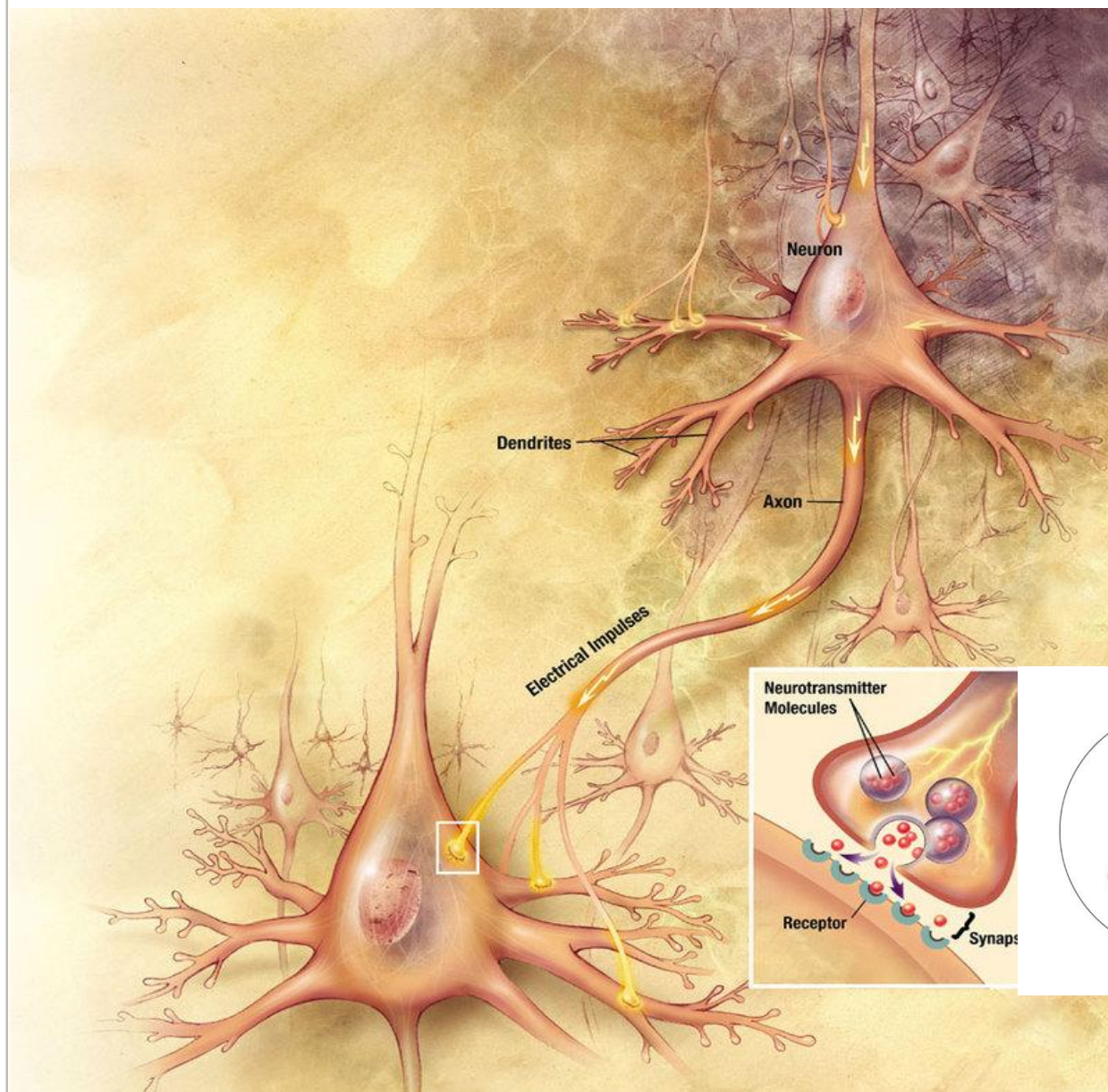
- To move by argument, entreaty, or expostulation
- To cause to know something; to teach
- To cause belief change

- D O'Keefe (2002) *Persuasion: Theory and Research*. Sage Publications



Source: [www.c2cinternet.org/index.php?id=185](http://www.c2cinternet.org/index.php?id=185)





# Necessary Conditions for Persuasion

- Attention
- Elaboration
- Credibility

# The Battle for Attention

- WM has a very limited capacity (Miller 1956:  $7 \pm 2$ )
- To win, the carrying utterance must:
  - imply large  $\Delta$  in pleasure or pain (urgency)
  - prevail over proximate others

- AD Baddeley, N Thomson, and M Buchanan (1975). "Word length and the structure of short-term memory." *J. Verbal Learning and Verbal Beh.* 14:575–589, 1975, AD Baddeley (1999). *Essentials of Human Memory*. Psychology Press., N. Cowan (2001). "The magical number 4 in short-term memory: A reconsideration of mental storage capacity." *Behavioral and Brain Sci.* 24:87–185.



# Climate Example

- To most citizens,
- The benefits of reducing emissions are: distant / abstract / uncertain
- The costs of lifestyle change are: immediate / concrete / certain

# What Non-Scientific Audiences Want

- Make it **close**.
- Make it **concrete** and **immediate**.
- Make the desired outcome **possible to achieve**

# B. Elaboration

Think about it...

What will you remember?



# What will you remember?





# What will you remember?



# What will you remember?





# What will you remember?

- If we try very hard, we can reconstruct only tiny fragments of life events.
- Even chunks that seem very important at the time.
- Implication: What a target audience remembers may not be what you want it to remember.

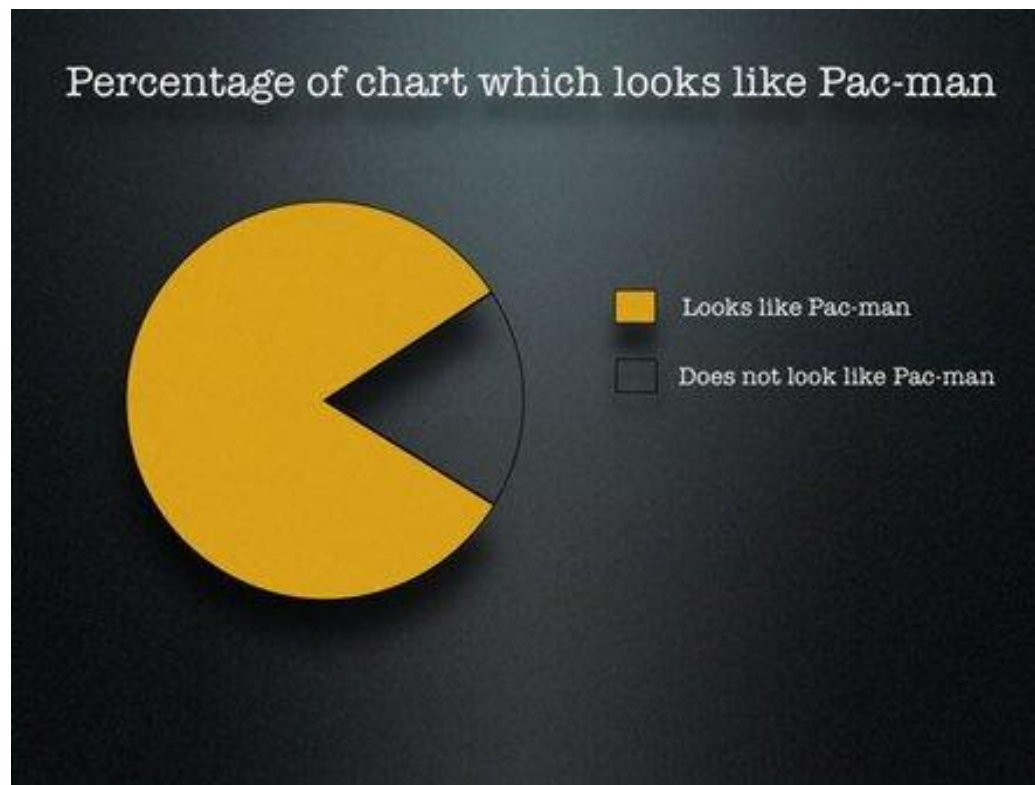
# What does this image represent?



What does this image  
represent?

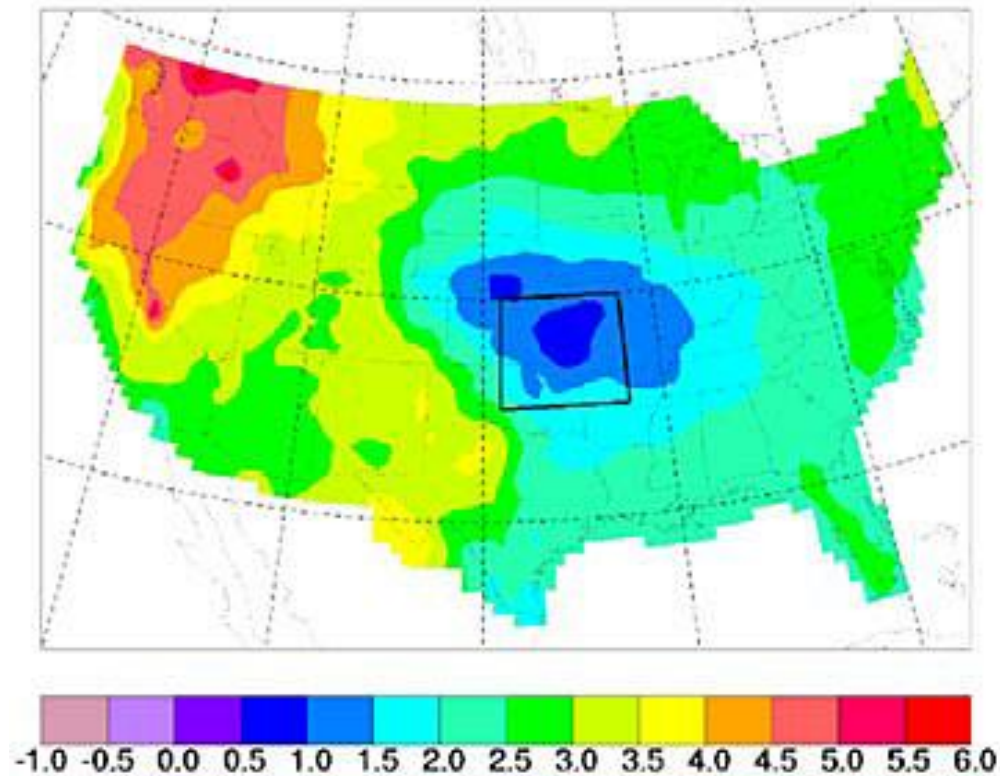


# The answer depends on what your audience fills in



*Attributed to numerous sources*

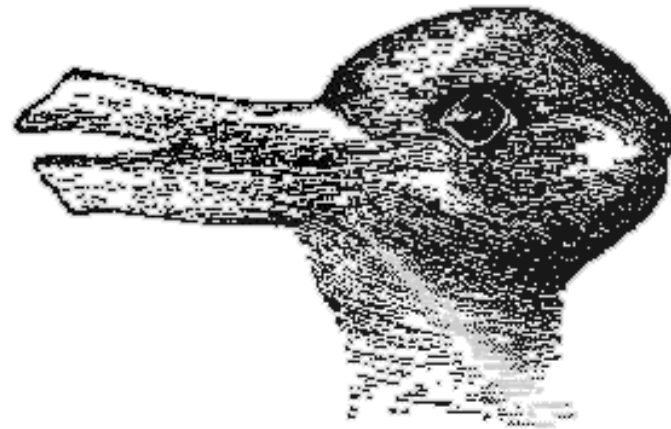
# Where's the Warmth?



Source: ISU Regional Climate Modeling Lab

# Credibility

Believe it or Not...Its Essential



23 Oct 1892 *Fliegende Blätter*

- “duck”



# ...in the Political Context

- Politics entails conflicts not easily resolved.
- It yields **language indeterminacy** with a nasty edge.
  - Conflict brings **incentives to manipulate** context and meaning.
- Result: “communication games” with unusual incentives.
  - People have to work harder to learn.
  - Persuasion requires **CREDIBILITY**

# Language and Leverage

- Political entrepreneurs seek leverage by
  - elevating favored arguments
  - and undermining others.
- If one political entrepreneur can reinterpret a statement for his own benefit, he will.

# “Lipstick on a Pig”

- A phrase that dates back to the 18<sup>th</sup> century.
- Controversial in 2008, but not in 2004.
- Why?

# VP Cheney (2004)

- “...Now, in the closing days of this campaign, John Kerry is running around talking tough.
- He's trying every which way to cover up his record of weakness on national defense. But he can't do it. It won't work.
- As we like to say in Wyoming, you can put all the lipstick you want on that pig, but at the end of the day it's still a pig. (Applause.)
- That's my favorite line. (Laughter.)” (19)

# Senator Obama (2008)

- “John McCain says he's about change too, and so I guess his whole angle is,
- 'Watch out George Bush -- except for economic policy, health care policy, tax policy, education policy, foreign policy and Karl Rove-style politics -- we're really going to shake things up in Washington.
- That's not change. That's just calling something the same thing something different.
- You know you can put lipstick on a pig, but it's still a pig”

# Governor Palin (three days earlier)

- “You know the difference between a hockey mom and a pit bull?
- Lipstick”

# Congressperson Drake (R-VA) (same day)

- “Barack Obama sunk to a new low today with his remarks today regarding Governor Sarah Palin....
- It is offensive not only to women, but anybody that cares about having a substantive debate on the issues.”



# Credibility

- ✘ For contested issues, high credibility is a must.
- ✘ Credibility is domain-specific and is bestowed by the audience.
- ✘ Credibility is a function of
  - + Source attributes\*
  - + Message attributes
  - + Contextual attributes\*
  - + Audience effects\*

# Credibility Formula

(Lupia & McCubbins 1998, Lupia & Menning 2009)

Source Credibility is a non-decreasing function of  
Perceived interest proximity,  
Perceived relative expertise,  
and their interaction

# It's Our Move..

We can make presentations that please “us” & affirm “our” values.

- And blame the audience if it does not persuade

OR

We can seek to persuade people who are different than us

- Let's base “our” strategies on the sciences of attention, memory, credibility, and decision making.

# Opportunity Awaits...



# Thank You!

[www.umich.edu/~lupia](http://www.umich.edu/~lupia)