

# Persuasion With Motivated Beliefs

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# The Talk I Should Have Given?

Golman, Russell, David Hagmann, and John H. Miller. 2015. "Polya's Bees: A Model of Decentralized Decision-Making." *Science Advances* 1 (8): e1500253–e1500253.

- ▶ Computational simulation (deterministic: Polya Urn)
- ▶ Groups aggregating information to make a decision
  - ▶ Preferred choice is more likely to be chosen again
  - ▶ Threshold decision rule (no leader)
- ▶ Bees, ants (groups of humans?)
- ▶ "Risk Aversion" as an emergent property

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- ▶ "Risk Aversion" as an emergent property
- ▶ Instead, presenting results of an (economic) experiment with people
- ▶ Non-deterministic, takes longer, more expensive... (why do we bother?)

## 3 Broad Topics For This Talk

1. What does persuasion with belief-based utility look like?
  - ▶ Desire to believe something, threatened by opposing information
  - ▶ Trade-off between decision utility & belief utility
2. Can we incentivize accuracy on beliefs people cherish?
  - ▶ Economists: abstract beliefs, real incentives, numeric estimates
  - ▶ Psychologists: closely-held beliefs, no incentives, scale responses
3. Can we enhance persuasiveness with an experimental intervention?
  - ▶ Add an expression of doubt from the sender before the receiver observes a message
  - ▶ Doubt should decrease informativeness of message
  - ▶ But a less convinced sender also appears less threatening; more likely to absorb persuasive argument

**Persuasion:** inducing a change in beliefs (as opposed to Coffman and Niehaus 2014)

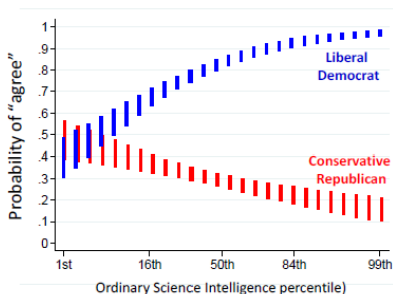
# Persuasion & Motivated Beliefs

# Inaccurate Beliefs Are Widespread

- ▶ Among Trump voters... (PPP 2016)
  - ▶ 40% believe Trump won popular vote
  - ▶ 67% believe unemployment increased under Obama
  - ▶ 39% believe stock market declined under Obama
  - ▶ 14% believe Clinton connected to (non-existent) child sex ring out of a DC pizzeria
- ▶ Information disconfirming these beliefs is easy to find, yet they persist
- ▶ Also: no partisan difference in tendency to avoid information across key domains (Ho, Hagmann, and Loewenstein, in preparation)

# Knowledge May Backfire

*There is "solid evidence" of recent global warming due "mostly" to "human activity" such as burning fossil fuels.*



(Kahan et al. 2016)

- Marshall cognitive resources to defend a preferred belief; hence more, not less, polarization

# Bayesian Persuasion

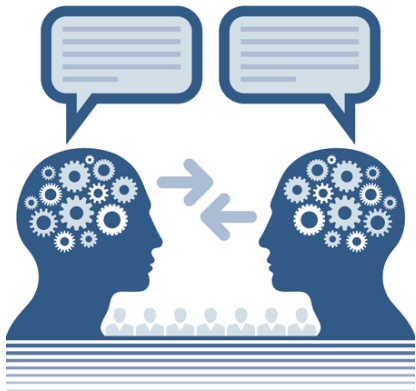
- ▶ Standard (and simple) approach is to present (credible) information
- ▶ Standard account of persuasion in economics is Bayesian  
(Kamenica & Gentzkow 2011)
  - ▶ Begin with prior, update without bias based on strength of evidence
- ▶ Assumes a desire to hold accurate beliefs; demand information to the extent it increases decision utility



# Information Avoidance

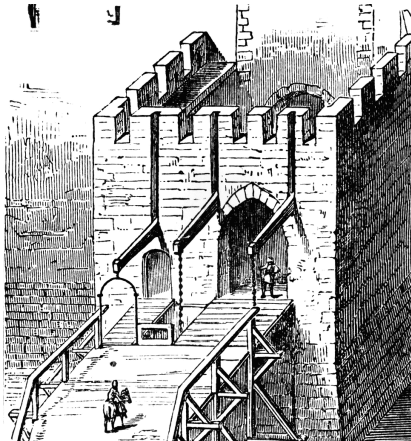
- ▶ With belief utility, may have reason to avoid useful information  
(Golman, Hagmann, and Loewenstein 2017)
- ▶ Reasons for avoidance
  - ▶ Belief investment (Golman, Loewenstein, Moene, and Zarri 2015)
  - ▶ Avoiding anxiety, e.g. climate change (Kahan, Jenkins-Smith, and Braman 2011; Marshall 2014)
  - ▶ Avoid information when it may dissuade a pleasant action (Wooley and Risen, unpublished)
- ▶ Strategies for avoidance
  - ▶ Physical avoidance (Ganguly and Tasoff 2014; Oster, Shoulson, and Dorsey 2013), inattention (Bakshy and Adamic 2015), forgetting (Shu and Gino 2012)
  - ▶ Biased updating (Eil and Rao 2011; Mobius et al. 2014; Sunstein et al. 2016)

# Persuasion: Standard Account



- ▶ Desire information if it **enhances accuracy** of beliefs
- ▶ Assess **credibility** of speaker
- ▶ **Unbiased** updating

# Persuasion: Proposed Behavioral Account



- ▶ Desire to **protect** beliefs
- ▶ Assess **threat** of anticipated persuader
- ▶ Erect **defenses** if threat is anticipated

## 2-Stage View of Persuasion

1. Individual recognizes a persuasive situation (e.g. arrival of an opinionated person, perusal of newspaper headlines)
  - ▶ Form expectation about threat to existing beliefs
    - ▶ Is the sender aligned with my beliefs?
    - ▶ How much do I value the belief?
    - ▶ How much expertise does the sender have?
  - ▶ Establish defenses (Pawel: Filter) according to this assessment
2. (Biased) updating of beliefs as a function of defenses  $\mathcal{D}$ 
  - ▶  $P(A|B) = (1 - \mathcal{D}) \cdot \frac{P(B|A) \cdot P(A)}{P(B)} + \mathcal{D} \cdot P(A)$

# Experimental Task

# Cherished Beliefs

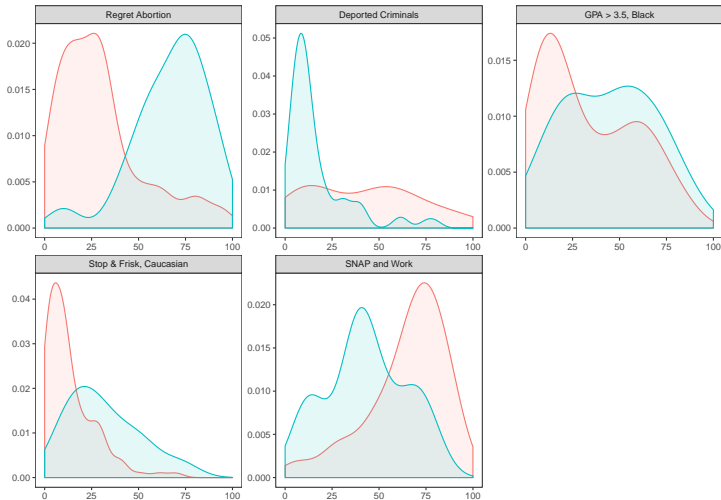
- ▶ Cherished beliefs are worth defending, but generally unverifiable (Abelson 1988)
  - ▶ e.g. view on death penalty, abortion, immigration
  - ▶ Generally no “right” answer
- ▶ Do we need incentives at all?
  - ▶ Unincentivized elicitations find significant shifts following little information in the lab, but does not match real world (Abelson 1988)
- ▶ Easily verifiable beliefs (e.g. contents of an urn) easy to incentivize, but not worth defending
  
- ▶ Strategy: Find questions that can be incentivized, but tackle closely-held underlying beliefs

# Beliefs & Convictions

- ▶ Incentivized (QSR) percentage estimate of...
  1. Women who regret having had an abortion
  2. SNAP recipients who work (at least part-time)
  3. African Americans graduating college with GPA > 3.5
  4. Caucasians arrested after Stop & Frisk in NYC
  5. Deported undocumented immigrants convicted of a crime
- ▶ Unincentivized (scale) elicitation of closely held beliefs
  1. Abortion should always be legal
  2. Government spends too much on welfare
  3. Support affirmative action in college admissions
  4. Support for stop & frisk
  5. Support path to residency
- ▶ Expect motivated reasons to hold a belief

# Results: Estimates of Strong Convictions

Distribution of estimates for people who strongly (dis)agree  
 ( $n = 202$ )





# Persuasion Experiment

# Main Study

- ▶ Persuasion task with a sender and a receiver
- ▶ Incentivize accuracy (both), persuasiveness (sender)
- ▶ Can expressing doubt, acknowledging conflicting views increase persuasiveness?
- ▶ Run in three sequential stages on Amazon Mechanical Turk
  1. Senders: Report estimates and craft a persuasive message
  2. Judges: Choose the most persuasive messages
  3. Receivers: Report estimates, receive persuasive message, then have a chance to revise

# Stage 1: Senders

- ▶ Participants recruited via MTurk ( $n = 402$ )
  1. Report 5 incentivized estimates and matching beliefs
  2. Write persuasive message about 1 question
    - ▶ Matched to question with strong belief (if possible)
    - ▶ Told (truthfully) they will be matched with a receiver who argued lower (higher) than they did
    - ▶ Incentivized to increase (decrease) receiver's estimate
  3. Repeat estimates (self-persuasion)
  4. Report extent of doubt about advice
  5. Write message aimed at establishing rapport

# Senders: Incentives

- ▶ Accuracy:
  - ▶ One estimate selected at random
  - ▶ Paid up to \$2, using quadratic scoring rule
- ▶ Persuasiveness:
  - ▶ Some of the most persuasive messages will be selected, shown to other participants
  - ▶ Select one question for each domain, each direction (higher, lower)
    - ▶ flat \$5 bonus if selected
    - ▶ \$0.50 for each percentage point receiver adjusts

## Senders: Expressing Doubt

- ▶ Want to (truthfully) report that sender validates diverging beliefs
- ▶ Participants have choice of 3 levels of doubt
- ▶ Two options are decoys (no doubt whatsoever; impossible to make recommendation)
- ▶ “I can see how someone could make a higher or lower estimate than I did. Providing an estimate is difficult, but I believe that I thought carefully about it. Although I am not completely convinced that my estimate is right, I think my argument will help someone make up their mind and make a good decision.”
- ▶ 92% chose non-decoy

## Example Message

Black students who graduated from a 4-year program have probably overcome a lot of adversity to accomplish their goal. To me, that indicates that they demonstrated a lot of drive and determination to reach that goal. People who demonstrate drive and determination are more likely to take their studies seriously and put in the required effort to do well. Therefore, I strongly suspect that black students who have graduated from a 4-year program were willing to work hard and do the best they possibly could. I also believe that black students in this situation may feel that they have more to “prove.” In other words, they may feel that society expects less from them and that could make them more determined to succeed and prove that they can accomplish what they set out to do. [...] For those reasons, I believe the majority of black students in college work hard and therefore are likely to graduate with a higher-than-average GPA.

## Stage 2: Judges

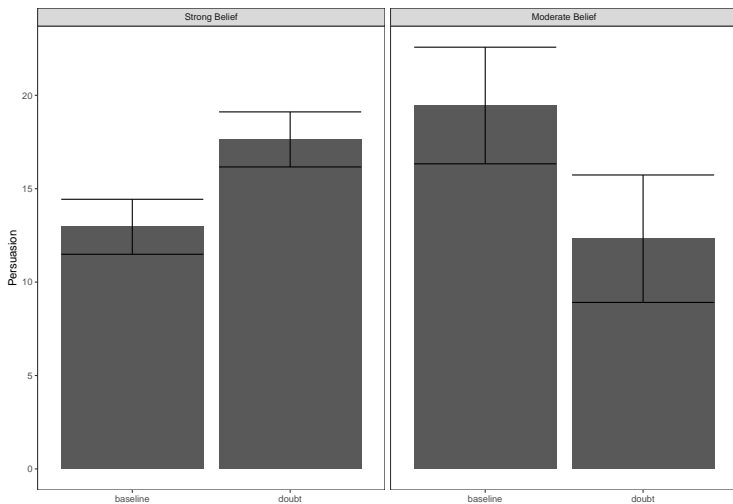
- ▶ Recruited 319 "judges" to rate persuasiveness of messages
- ▶ Each judge rated 10 messages, all in the same domain and in the same direction
- ▶ At least 3 judges rated every message
- ▶ Picked the message in each domain, direction with highest median score
- ▶ Senders of all messages selected the same "doubt" message (non-decoy)

## Stage 3: Receivers

- ▶ 405 Participants recruited via MTurk
- ▶ Elicitate estimates and beliefs
  - ▶ One estimate incentivized, selected at random (QSR)
- ▶ Randomly matched to belief they strongly (dis)agree on
  - ▶ If no strong belief, matched to random question
- ▶ Two conditions
  1. See “doubt” message (same across all senders)
  2. No message (baseline)
- ▶ Receive persuasive message
- ▶ Incentivized second estimate on that question only



# Receivers: Persuasion by Condition



# Receivers: Persuasion OLS

	Percentage Points Persuaded		
	Baseline	Interaction	Message FE
Doubt	2.431 (1.918)	-7.131 (4.370)	-5.802 (4.232)
Strong Belief	-1.164 (2.431)	-6.493* (3.262)	-4.887 (3.168)
Doubt x Strong Belief		11.808* (4.856)	10.830* (4.717)
Intercept	15.286*** (2.335)	19.455*** (2.885)	24.871*** (6.686)
Message FE	No	No	Yes
Observations	405	405	405
R <sup>2</sup>	0.004	0.019	0.119

Note:

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

## Bonus: Do Senders Persuade Themselves?

- ▶ Persuaders may end up persuading themselves as well as the recipient (Brinol et al. 2012)
- ▶ Senders provided two estimates for all questions
- ▶ Compare change in second-round estimate after writing a persuasive message vs. the remaining beliefs

# Bonus: Self-Persuasion

	Self-Persuasion		
	Baseline (1)	Interaction (2)	Added FE (3)
Persuasiveness	0.019 (0.010)	0.008 (0.011)	-0.055 (0.183)
Persuasive Message	-0.544 (0.575)	-2.891* (1.137)	-2.882** (1.104)
Persuasiveness x Persuasive Message		0.059* (0.025)	0.059* (0.024)
Intercept	-0.883 (0.470)	-0.413 (0.508)	-5.763 (5.767)
Belief FE	No	No	Yes
Individual FE	No	No	Yes
Observations	2,005	2,005	2,005
R <sup>2</sup>	0.002	0.005	0.262

Note:

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

# Discussion

## 3 Insights From This Talk

1. When receivers are invested in their beliefs, supposedly irrelevant (or even counterproductive) strategies can be successful
  - ▶ Bombarding with facts is tempting, but may engender defensive avoidance, rather than receptive processing
2. Picking questions that are tied to closely held beliefs allow for incentives, motivated processing
3. Being forced to think through an argument may be effective at dissuading oneself

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3. Being forced to think through an argument may be effective at dissuading oneself
  - ▶ Bonus: Experiments are worthwhile; probably easier to do than you think given *MTurk* (US; easy to get 6,000 US residents) and *Prolific Academic* (Global; smaller pool)
  - ▶ New tool allows real-time matching, text, audio, and video chat

# Policy Implications

- ▶ With biased processing of information, polarization and disagreements unlikely to be resolved by new information
  - ▶ May not obtain information to begin with (News bubble)
  - ▶ Biased updating may further increase polarization (Babcock, Loewenstein, Issacharoff, Camerer 1995; in negotiation context)
- ▶ People may lack understanding of successful persuasion strategies, leading to ineffective communication, gridlock