

The Economics of Motivated Beliefs

Roland Bénabou

Based in part on joint work with Jean Tirole

Harvard Behavioral Economics Seminar - November 2016

Background papers

- Bénabou, Roland and Jean Tirole. “Mindful Economics: The Production, Consumption, and Value of Beliefs,” *Journal of Economic Perspectives* (2016), 30(3), 141-164.
- Bénabou, Roland , “The Economics of Motivated Beliefs,” Jean-Jacques Laffont Lecture, *Revue d’Economie Politique* (2015), 125(5), 665-685.

How do people form their beliefs?

- 1 Backward-looking expectations / trend extrapolation, adaptive learning
- 2 Rational expectations, Bayesian equilibrium (with refinements)
- 3 Fixed (wired-in) “biases and heuristics”: base rate neglect, confirmation bias, law of small numbers, hot hand fallacy, probability weighting...
- 4 Motivated beliefs, cognition, reasoning: forms of self-deception
 - ▶ Held (or more likely to be) due to emotional or functional value
 - ▶ Resistant to evidence, but respond to costs, benefits and stakes
 - ▶ Other telltale signs of self deception / own-belief manipulation:
 - Information aversion: not willful blindness
 - Selective attention, retrieval, memory
 - Neural signatures?

Self-deception / motivated beliefs

- About the self:
 - ▶ Talent, intelligence, willpower, beauty, morality
 - ▶ Future prospects: rich vs. poor, healthy vs. sick, happy vs. unhappy
 - ▶ Identity (where do I belong? what are my values, goals?)
 - About how the world works:
 - ▶ Causes of **inequality (effort vs. luck)**, **social mobility**, “Belief in Just World”
 - ▶ Ideology, e.g. merits of state vs. market, proper scope of government
 - ▶ What is moral or immoral, “taboo”
 - ▶ Other people: trust, in-group / out-group stereotypes
 - ▶ Religion, culture
 - Much evidence that often **not formed and revised in a neutral, objective manner, but in part to serve important “needs”**
 - ▶ Purely psychological, consumption value
 - ▶ Functional, instrumental
- ⇒ **Beliefs as assets** that people invest in, value, defend, expend, repair, etc.

Beliefs and misbeliefs: some examples

- Much apparent overoptimism, overconfidence, “better-than-average effect”: driving ability, intelligence, sense of humor, likelihood of good / bad life events, etc.
- But such **snapshots** of reported beliefs (or even elicited, from choices with real stakes), e.g. 90% think above average, 2/3 think are in top 1/3, etc., may in fact be consistent with rational, Bayesian model
 - ▶ Depends what signals people have received. Need much more stringent tests (Benoit-Dubra Ecta, 2011, Merkle-Weber (2011))
- More convincing –and interesting– is to study **process by which beliefs are formed** / come to be distorted
- Also, relate this to factors that can plausibly affect the “demand side” (self-esteem, motivation, better deceiving others, anticipatory utility,...) or the “supply side” of belief distortion (ambiguity / malleability of information, feedback, etc.)

Beliefs and misbeliefs: some examples

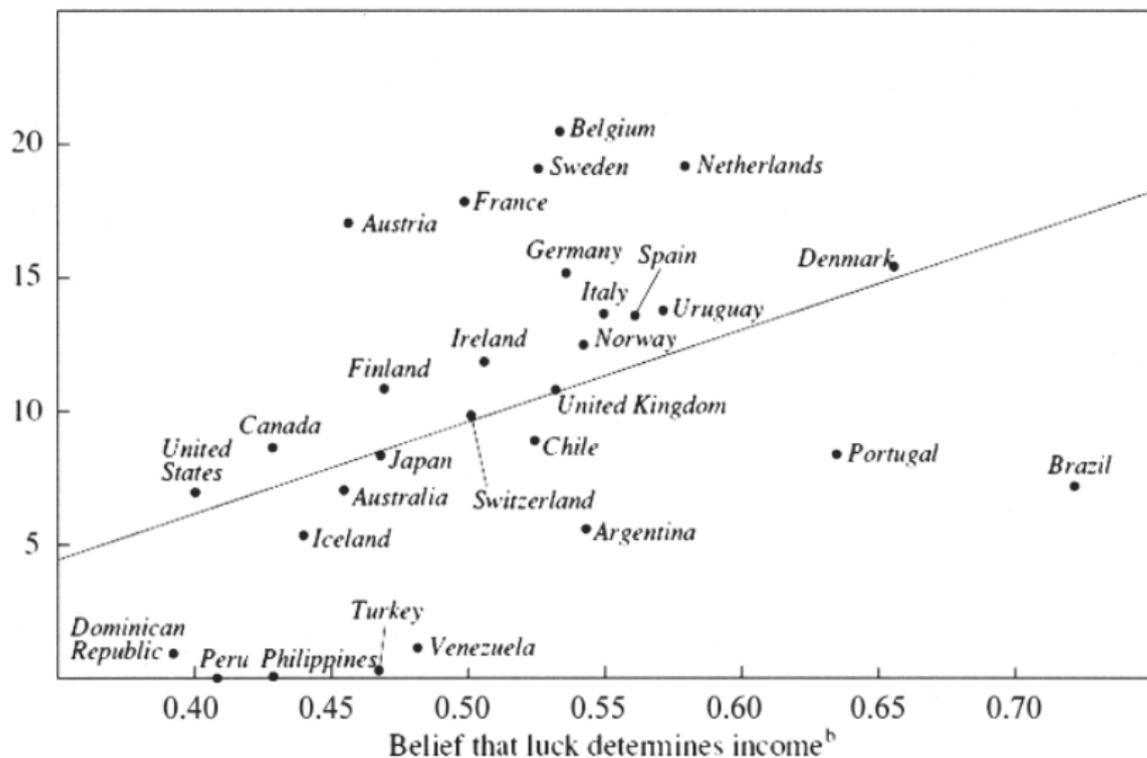
- Beliefs at odd with preponderance of evidence: 47% of Americans think humans were created instantaneously, 52% believe that humans and dinosaurs coexisted. Conspiracy theories (all over the world), global warming, etc.
- Implausible beliefs about rising asset prices during bubbles (Shiller 2005)
- Wide divergences in economic and political beliefs across otherwise similar countries (and also within): ideologies, conspiracy theories

Case-Shiller (2003): expectations of housing price increases

<i>Question</i>	<i>Los Angeles</i>		<i>San Francisco</i>		<i>Boston</i>		<i>Milwaukee</i>	
	<i>1988</i>	<i>2003</i>	<i>1988</i>	<i>2003</i>	<i>1988</i>	<i>2003</i>	<i>1988</i>	<i>2003</i>
Do you think that housing prices in the [city] area will increase or decrease over the next several years?								
Increase	98.3	89.7	99.0	90.5	90.2	83.1	87.1	95.2
Decrease	1.7	10.3	1.0	9.5	9.8	16.9	12.9	4.8
No. of responses	240	145	199	158	194	201	233	187
How much of a change do you expect there to be in the value of your home over the next 12 months?								
Mean response (percent)	15.3	10.5	13.5	9.8	7.4	7.2	6.1	8.9
Standard error	0.8	0.6	0.6	0.6	0.6	0.4	0.5	1.0
No. of responses	217	139	185	147	176	179	217	160
On average over the next 10 years, how much do you expect the value of your property to change each year?								
Mean response (percent)	14.3	13.1	14.8	15.7	8.7	14.6	7.3	11.7
Standard error	1.2	1.2	1.4	1.8	0.6	1.8	0.5	1.3
No. of responses	208	137	181	152	177	186	211	169

Beliefs about social mobility

Social spending (percent of GDP)^a



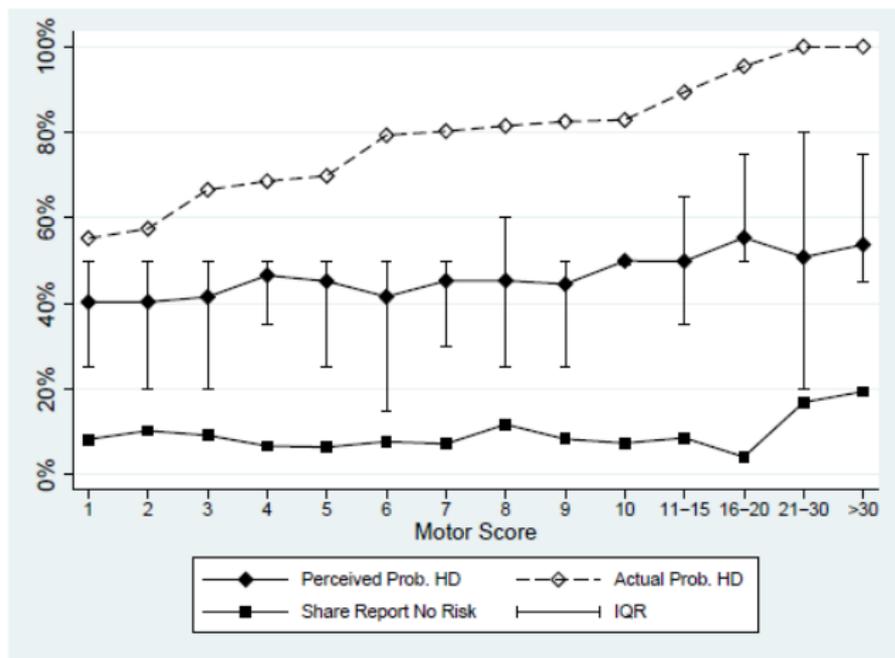
Do they really believe (act on) it?

- Do so in incentivized experiments, e.g. displaying overconfidence
- Empirical data \Rightarrow evidence that do for health, housing, stocks
- Vote on it:
 - ▶ Beliefs about determinants of economic success (luck or effort) are strong explanatory factors of individual attitudes toward redistribution as well as actual national social spending (Alesina et al. 2001)
 - ▶ Trust in markets strong negative predictor of size of the state / GDP (Bénabou 2008)
- Often incur very high costs to defend or “express” beliefs: identity, religion
 - ▶ Augenblick et al. (2012) on end-of-world beliefs

Wishful perceptions of health risks

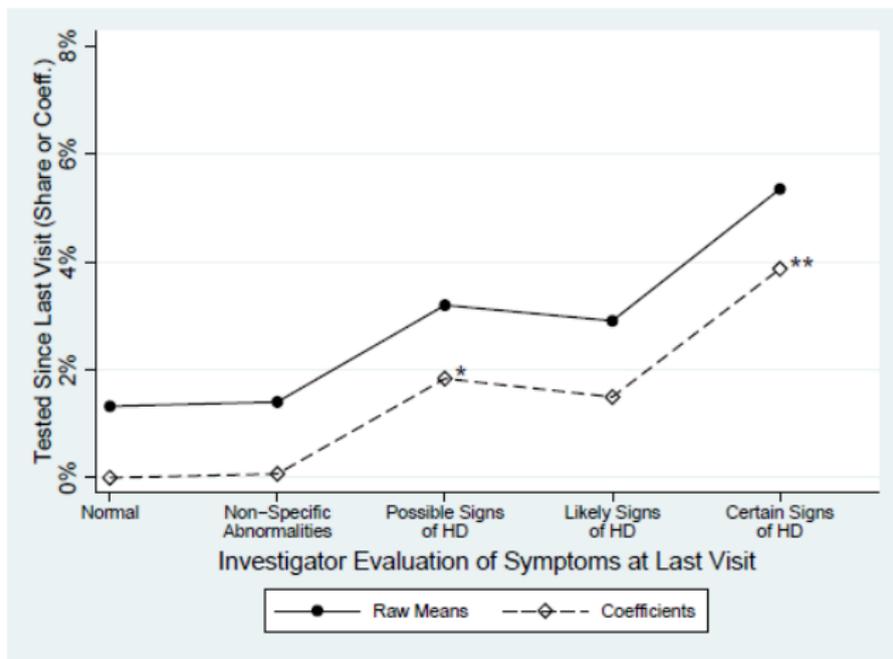
- Oster et al. (2013): follow untested people at risk for risk for Huntington's disease (1 parent has gene variation \Rightarrow 50% ex-ante chance; updated based on symptoms)

Figure 4. : Perceived and Actual Risk of HD, by Motor Score



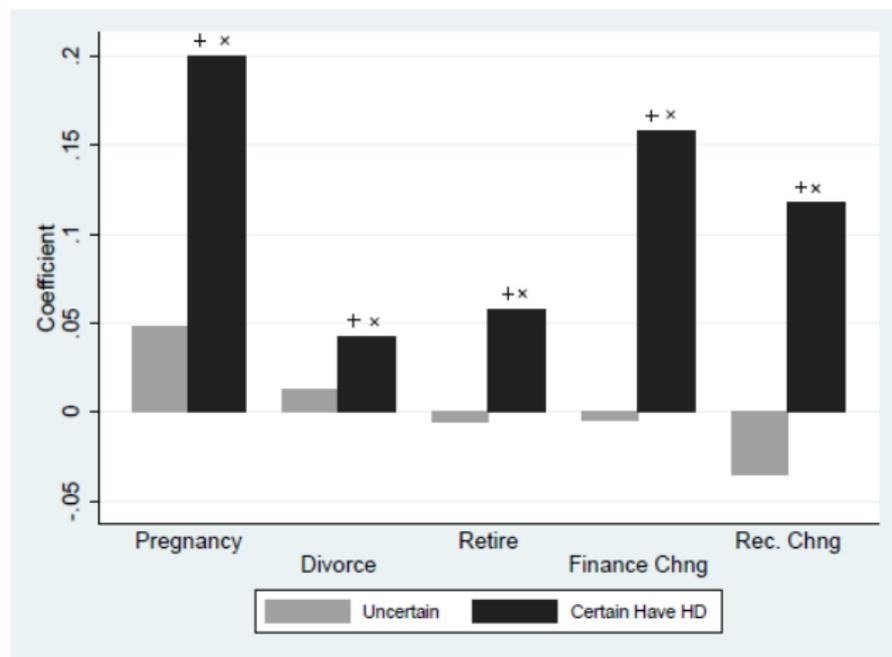
(Non) Demand for testing

Figure 1. : Testing Behavior and Investigator Evaluation of Risk



Behavior consistent with stated beliefs

Figure 5. : Behavior Choice Relative to Individuals without HD Expansion



I - Understanding Self Deception

1. Why? (Demand side)

- Standard decision theory: better info \Rightarrow single DM (weakly) better off
- Hedonic value of beliefs: Schelling's (1984) "mind as a consuming organ"
 - ▶ Self-esteem, ego (B & T 2002, Koszegi 2006)
 - ▶ Anticipatory utility, reassurance about future (Akerlof & Dickens 1982, Loewenstein 1989, Caplin & Leahy 2010) Brunnermeier & Parker 2005, B & T 2011)
- Functional value of beliefs
 - ▶ Self-motivation, self-control: worry about future selves' actions (B & T 2006)
 - ▶ Signaling: convincing oneself makes it easier to convince others

2. How? (Supply side)

- Ex-ante information acquisition or avoidance
- Ex-post signal distortion: "management" of attention, interpretation, recall
 - ▶ Either direct or via self inference (use own actions as diagnostics)

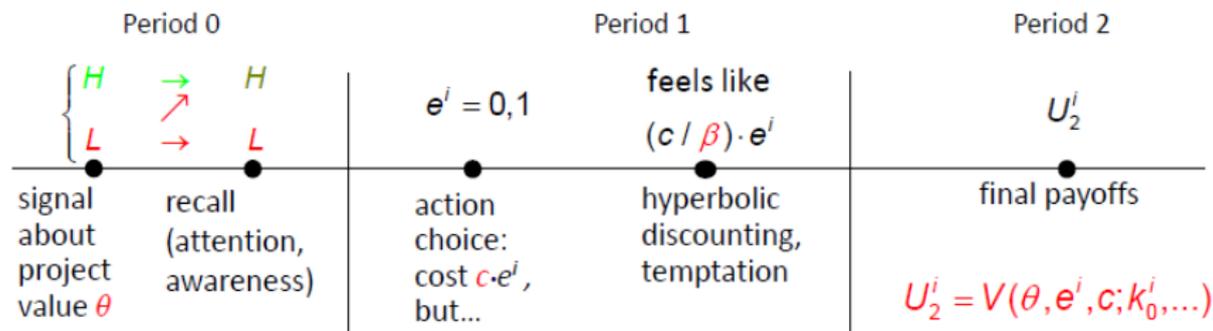
3. Welfare? Ultimately good/bad, functional or dysfunctional

Motivated cognition vs. fixed heuristics & biases

- Very different from mechanical biases and heuristics (“System I”)
 - ▶ E.g., Rabin & Schrag (1999), Eyster & Rabin (2005), Madarasz (2012)
 - ▶ Here: critical role of **emotions/desires**, both current and anticipated, interacting with **cognition**
 - ▶ Responds to incentives and **stakes**, whether economic or psychological / hedonic. Example: self-serving beliefs vs. confirmation bias
 - ▶ More cognitively sophisticated or educated people may be **better** at maintaining, defending desired beliefs (Kahan 2012)
- Consistent with line in psych. that re-emphasizes role of emotions, especially those evoked by future good and bad prospects
 - ▶ Damasio (1994): emotions, esp. in anticipating future situations, are critical to making even good decisions; sometimes, bad ones
 - ▶ Neuroscience; growing literature on processes underlying motivated beliefs, selective memory / asymmetric updating (Benoit & Anderson 2012, Sharot et al 2012)

II - A Simple Unifying Framework

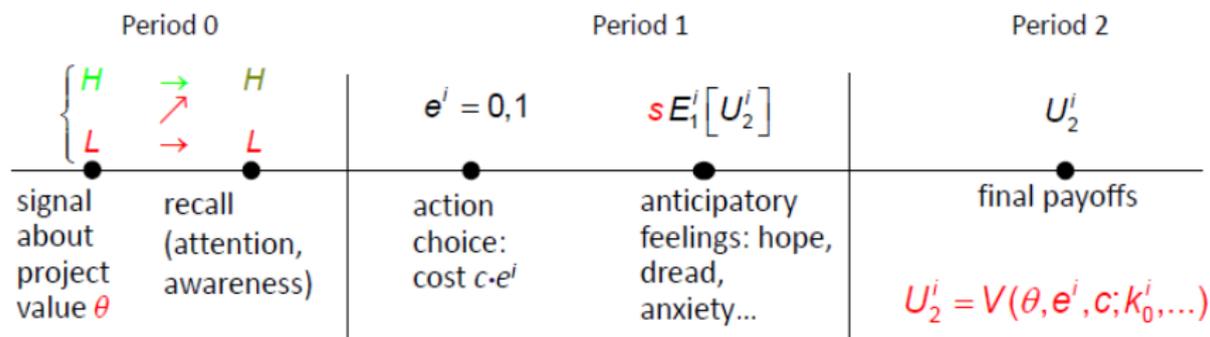
1. Self efficacy / motivation and self deception (B&T 2006)



- In period 1, will face temptation to slack off, give up, cheat, overconsume...
- Return (long-term value, effectiveness) of endeavor is imperfectly known: depends on ability, probability of survival of individual or social relationship
- Maintaining a "positive view" of that return helps enhance, preserve motivation
- Hence benefit to selectively process (encoding, recall, awareness) good vs. bad news. But also risks.

A Simple Unifying Framework

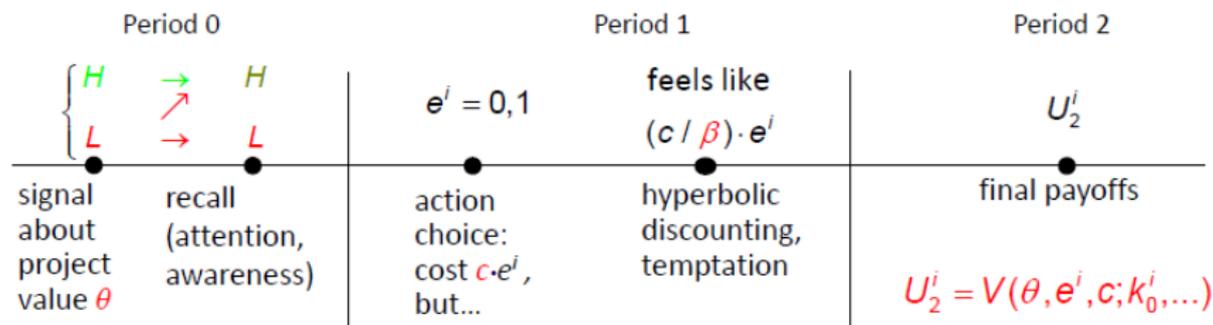
2. Anticipatory feelings and self deception (B&T 2011, B 2013)



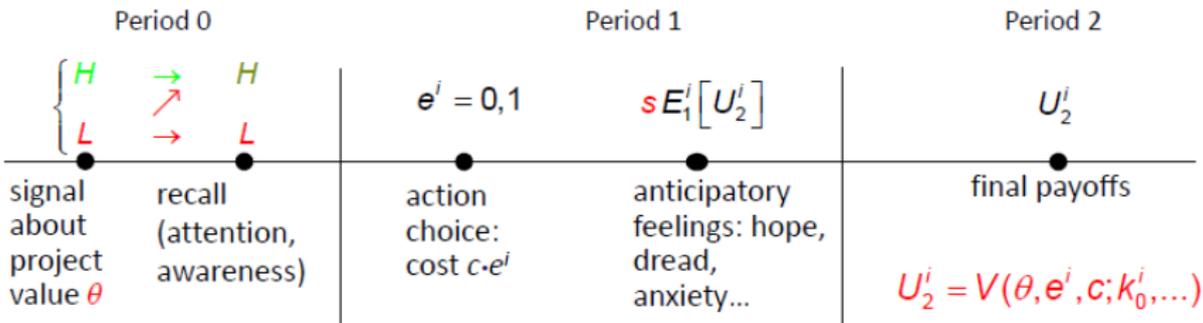
- In period 1, will experience hope, dread, anxiety about long-term outcome, welfare "consuming" beliefs
- That utility will depend on decisions taken and their returns (hence on ability, durability of relationships, etc. Also, on initial endowment of (human, social, professional) capital k_0^i)
- Maintaining a "positive view" of future outcomes has hedonic benefits
- Hence benefit to selectively process (encoding, recall, awareness) good vs. bad news. But also distorts decisions

A Simple Unifying Framework

1. Self-Motivation and Belief Distortion



2. Anticipatory Utility and Belief Distortion



A Simple Unifying Framework: Synthesis

- Period 1: makes decisions (if any) to maximize

$$U_1^i = -c/\beta e^i + sE_1[U_2^i] + \delta E_1[U_2^i]$$

- Period 0: cognitive “choices” or tendencies, aiming to maximize

$$U_0^i = -\text{info costs}/\beta + \delta E_0[-ce^i + sE_1[U_2^i]] + \delta^2 E_0[U_2^i]$$

- ▶ Nests **anticipatory utility** ($\beta = 1, s > 0$) & **self-motivation** ($\beta < 1, s = 0$)
 - ▶ Positive results similar, normative implications potentially different
- Useful to decompose final payoffs:

$$U_2^i = \alpha \cdot \theta_\sigma e^i + (1 - \alpha) \cdot \kappa_\sigma^i, \quad \text{for } \sigma = H, L,$$

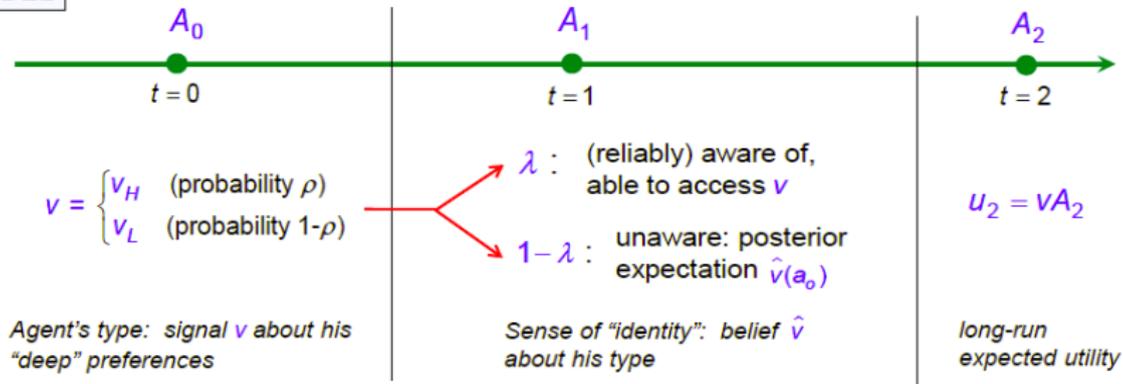
- κ_σ^i : fixed **stakes**, resulting from
 - ▶ Agent i 's previous investments, sunk decisions: exogenous stakes
 - ▶ Other agents' $j \neq i$ equilibrium actions in state $\sigma = H, L$, affecting organization, market: endogenous stakes (Bénabou 2013)

Self-deception as biased information processing

- Signal $\sigma = H$ or $L \Rightarrow$ how much attention to pay, how to interpret, whether to “keep it in mind” or “not think about it”. Also: willingness to pay for σ
- **Wishful thinking:** intrapersonal game of communication, via **attention, memory, awareness, interpretation, rationalization** (Bénabou & Tirole 2002)
 - ▶ **Realism:** acknowledge - encode - recall $H \rightarrow H$ and $L \rightarrow L$
 - ▶ **Denial:** ignore - miscode - misremember $L \rightsquigarrow H$ (or $H \rightsquigarrow L$)
Self-deception, selective inattention, rationalization: cost m
 - ▶ Partial awareness: $0 < \text{recall rate} < 1$
- **Not wanting to know:** ex-ante information avoidance
 - ▶ At $t = 0$, agent chooses whether or not to learn the signal σ
 - ▶ Anticipatory utility concave in beliefs \Rightarrow preferences for late / lesser resolution of uncertainty (Kreps-Porteus 1978, Bénabou 2013)
 - ▶ Tradeoff with decision value of information.

3. Self-signaling: manipulating one's diagnostics

MODEL



- Identity-specific capital: A_t (wealth, human capital, cv, social status, good/bad deeds, family or friends, culture, religion, health; or fixed: gender, race).

- Identity-specific activity or investment: $a_t \in \{0,1\} \Rightarrow A_{t+1} = A_t + a_t r_t$

How important is A to me in the long run? What are my true values? What kind of a person would investing / not investing in A "make me"?

- True preference / type v is only episodically accessible

- The rest of the time, has to be inferred from past actions: $\hat{v}(a_0) = E[v|a_0]$.

$1-\lambda$ = malleability of beliefs through actions \Rightarrow scope for self-signaling.

III – Main Results: Individual Behavior

- Ex-post, **asymmetric updating** for good vs. bad news: denial, rationalization, wishful thinking. Matches evidence on asymmetric **recall**, awareness, updating
- Ex-ante, **information avoidance**: willful blindness
- **Comparative statics**: selective awareness more likely for beliefs relevant to:
 - ▶ Tasks for which **perseverance in spite of temptation** is more of an issue
 - ▶ **Fixed or long-lasting forms of "capital"**: intelligence, health, attractiveness, honesty, social or cultural capital, ethnic identity, specialized human capital, illiquid assets: higher s
 - ▶ Issues on which final resolution ("day of reckoning") further into the future
 - ▶ **Higher initial endowment** of illiquid asset with uncertain return: $\kappa_{\sigma}^i \equiv \theta_{\sigma} k_0^i \Rightarrow$
 \Rightarrow incentive for denial $\sim s(\theta_H - \theta_L) \times \text{fixed stakes} = s(\theta_H - \theta_L)(1 - \alpha) \cdot k_0^i$
- \Rightarrow **Stakes-dependent beliefs**

Main results: individual behavior

- Decisions for which cost of mistakes is smaller, e.g. because individual less likely to be pivotal: e.g. **voting**
- **Endowment effect**: have k_0^i (wealth, social or cultural capital, etc.) \Rightarrow persuade myself will yield high return or future utility
- **Escalating commitment**: once think k^i asset is good for me, accumulate more of it, hence higher stakes in being optimistic about its long-term value to me, etc.
- **Hedonic treadmill**: such escalation may actually reduce utility, yet be unavoidable. Self-trap. pursuit of wealth, fame, "purity" ...

Asymmetric updating about oneself

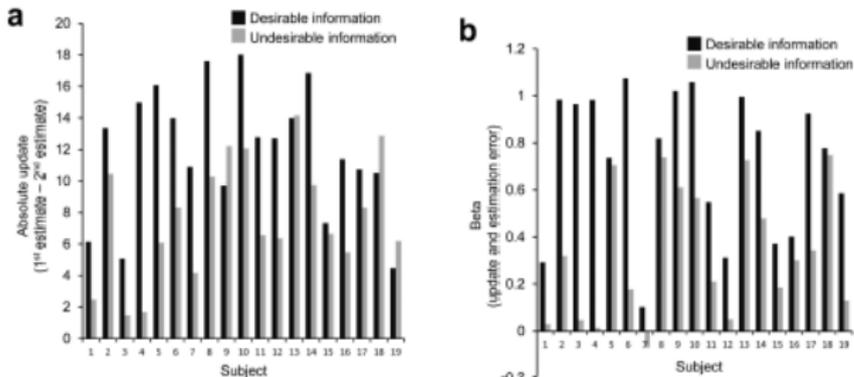
- “The Good News-Bad News Effect” (Eil & Rao 2011); Möbius et al. (2010)
- Link to tradition in psychology: evidence of self-serving / selective / biased use or recall of information
 - ▶ See, e.g., Kunda (1987). Also Babcock et al. (1995) on bargaining
- Stage 1: collect info to rank the subjects on **intelligence** (IQ tests) or beauty (speed dating). Control condition: **card** with random number from 0 to 9
- Stage 2:
 - ▶ Subjects state their **prior belief**, in %, for being in each of 10 ranks on task
 - ▶ Two rounds of: (a) learn if rank above of below other randomly selected, anonymous participant; (b) state updated belief (incentivized)
 - ▶ At the end: elicit willingness to pay to learn / not learn true rank

Summary of main findings

- 1 Update close to Bayes' rule for positive signals, **underupdate for negative signals**. But only when signals are about something have a stake in.
- 2 Will buy information when have relatively optimistic beliefs about, will pay to avoid it when have pessimistic beliefs
- 3 No evidence of confirmatory bias, **valence of signal matters!**
- 4 Möbius et al. (2010) "Self-Confidence Management: Theory and Experimental Evidence":
 - ▶ Similar experiment (on IQ only) with even "cleaner" methodology: beliefs elicitation mechanism more robust + subjects state beliefs only about binary outcome (being in top 50%) rather than full posterior distribution, making it much easier to compute what Bayesian updating should be.
 - ▶ Find underadjustment even to good signals, but significantly more in response to negative signals.

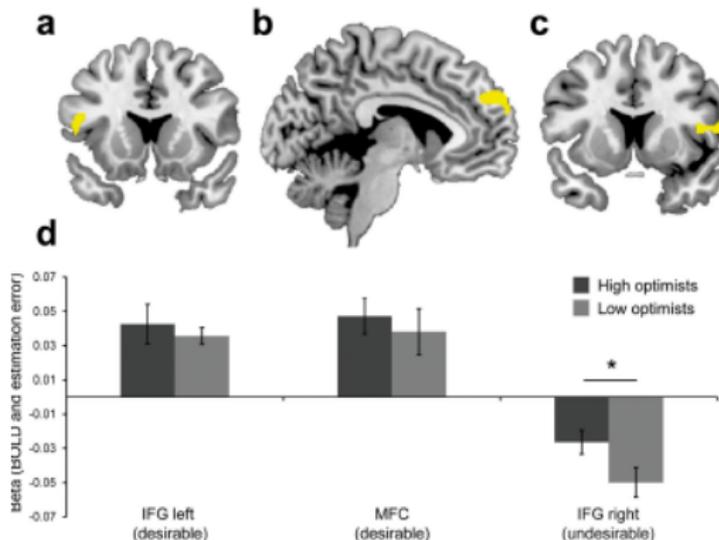
Sharot-Korn-Dolan : "How Unrealistic Optimism is Maintained in the Face of Reality" (Nature Neuroscience 2012)

- For 80 "bad life events" (e.g., cancer, accident, etc.): self-ratings of own risk, both before and after receiving accurate information about true probability for a person of same age, gender, ethnic and socioeconomic characteristics
- Examine whether updating displays **good/bad news asymmetry**



Mechanism

- Examine whether **prediction error** has explanatory power for extent of belief revision: it does
- See what regions of brain activated by + or - prediction error: **different ones**
- Across subjects: high optimists (based on prior questionnaires) show systematically **less activation of area detecting negative prediction errors**; no difference for positive ones



Asymmetric updating about educational returns

- “How do Students Respond to Information about Earnings?”

(Wiswall & Zafar, 2013)

- Three steps:** (a) Elicit beliefs about own future earnings & average earnings by major; (b) Provide actual population earnings, by major; (c) Elicit updated beliefs about own earnings

Table 6: Self Earnings Updating and Population Errors

Dependent Variable: Revisions in Self Earnings Beliefs (Intermediate – Initial)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Panel A</i>							
Error ^a		0.184***					
		(0.02)					
Error x General T							
Error x Specific T							
Error x 1(Error>0)			0.347*				
			(0.19)				
Error x 1(Error<0)			0.159***				
			(0.02)				
Err x Gender Match ^b				0.439***			
				(0.06)			
Err x Gend No Match				0.284***			
				(0.04)			
Num. Obs	2475	2475	1200	2475	2475	2445	2321

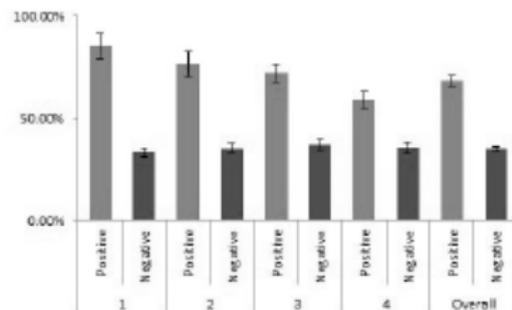
Asymmetric recall of past performance

- “Selective Memory & Motivated Delusion” (Chew, Huang & Zhao 2012)
- Stage 1: 621 subjects, each answers 4 questions from Ravens IQ test; incentive = lottery for \$100, worth \approx \$1 in expectation
- Stage 2: Two months later, called back, showed same 4 questions + 2 had not seen, with the answers
 - ▶ Asked to recall whether answered correctly, incorrectly, had not seen, or can't remember. +\$1 for correct response, -\$1 for incorrect, 0 for “can't remember”
- 8 possible types of recall errors: +/- “Amnesia” ($\sigma \rightarrow \emptyset$), “Confabulation,” ($\sigma \rightarrow \sigma'$), “Delusion” ($\emptyset \rightarrow \sigma$)

	a	b	c	d
$s = G$	a_G : CR	b_G : Negative C	c_G : Negative A	d_G : Weak Negative A
$s = B$	a_B : Positive C	b_B : CR	c_B : Positive A	d_B : Weak Positive A
$s = \emptyset$	a_\emptyset : Positive D	b_\emptyset : Negative D	c_\emptyset : CR	d_\emptyset : Weak CR

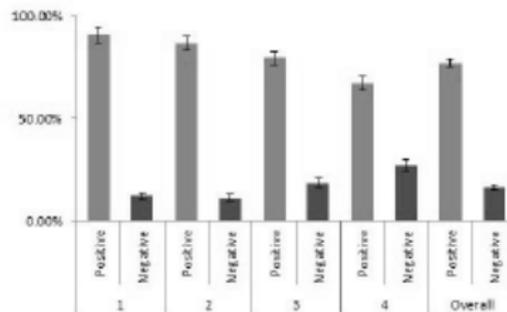
Memory biases conditional on performance

Positive Amnesia vs. Negative Amnesia



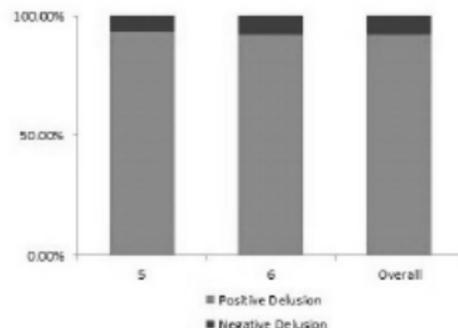
a

Positive Confabulation vs. Negative Confabulation



c

Positive Delusion vs. Negative Delusion



b

Asymmetric recall of (un)fairness

- “Asymmetric Memory Recall in Social Interactions” (Li 2012)
- Trust Game: A trusts or not, if trusts B reciprocates or not.
- Strategy method. Then, after 0, 7 and 43 days: incentivized recall
- Results:
 - ① A player whose trust was betrayed is more likely to forget the act than one for whom was reciprocated
 - ② A player whose trust was betrayed is more likely to forget her trusting decision than one who did not trust
 - ③ A player who committed an unkind act perceives it as less unkind as time elapses
- Thompson & Loewenstein (1992) “Egocentric Interpretations of Fairness in Negotiations”
- Babcock et al. (1995) “Biased Judgements of Fairness in Bargaining”

Stakes-dependent beliefs

- Mijovic-Prelec and Prelec (2010): “Self-Deception As Self-Signalling: A Model And Experimental Evidence”
- Mayraz (2011): “Wishful Thinking”
- 145 subjects, observe chart of “historical wheat prices”, then predict what price would be at date 100. Also state a level of confidence (1-10) in their prediction
 - ▶ Paid accuracy bonus. Do this 12 times
 - ▶ All prices normalized to lie in [$\$4000$, $\$12000$]
- Randomly assigned to being Farmers, whose payoff is $P - 4000$, or Bakers, whose payoff is $16000 - P$
- Stakes = $\$0.5$ or $\$1$ for each $\$1,000$ of notional profit

Stakes-dependent beliefs

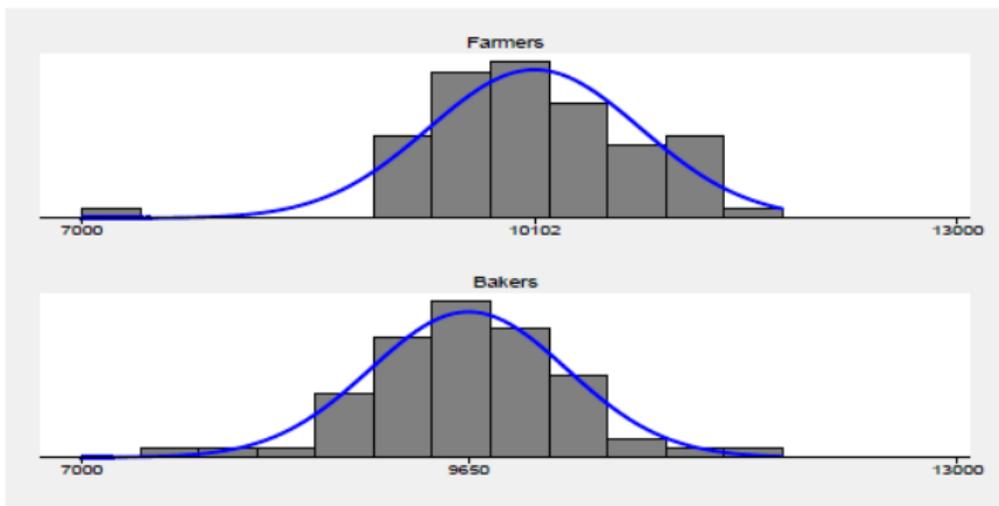
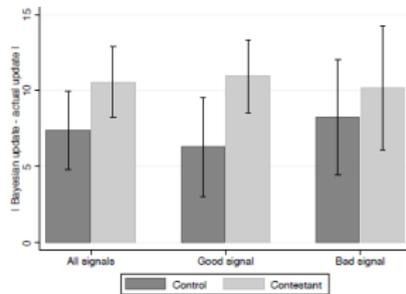
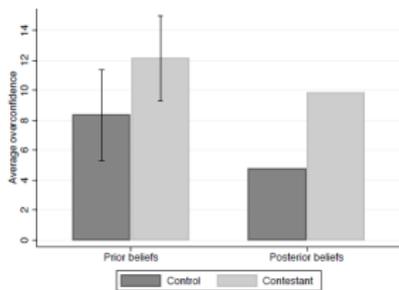


Figure 4: Histogram of the mean predictions made by *Farmers* and *Bakers*. A normal distribution curve was fitted to both histograms. The mean prediction was 10102 and 9650 respectively. 16 of the 20 subjects making the highest (lowest) mean predictions were *Farmers* (*Bakers*).

- Not consistent with rational expectations, fixed cognitive bias, or ego utility
- Consistent with anticipatory utility, broadly defined

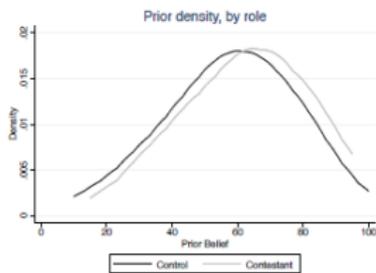
Another test of stakes-dependent beliefs

- Schwardmann & van der Weele (2016): “Deception and Self-Deception”.
 - ▶ Test Trivers and von Hippel channel:
- Design: 288 subjects = 18 sessions of 16. Each session = 4×4 groups. First, take IQ (Raven’s test). Then:
- “Self -deception” stage:
 - ▶ Elicit incentivized beliefs that are among top 2 in group, under “control” and “contestant” conditions. Contestants told that will be matched with “employer,” who will decide whom to “hire,” with incentives for picking top performers. Being hired is valuable
 - ▶ Give noisy feedback about performance, elicit posterior beliefs. Also a clever source of exogenous variation in self-confidence.
- “Deception stage”: face to face “interview” with employer
 - ▶ Additional conditions (i) give employers lie-detection tutorial, warn/not warn contestants about it; (ii) measure lying aversion

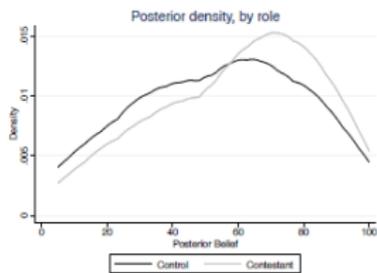


	(1)	(2)	(3)	(4)
Score	0.993*** (0.111)	0.954*** (0.174)	0.987*** (0.119)	0.985*** (0.119)
Contestant (d)	3.737** (1.885)		4.401** (1.972)	5.265* (2.861)
Warned (d)		1.843 (2.867)		
Lie av. (d)		1.917 (2.717)		
Dominant (d)			3.937* (2.017)	4.770 (2.929)
Contestant * Dominant (d)				-1.641 (3.951)
Constant	45.47*** (2.053)	48.05*** (3.206)	43.42*** (2.246)	42.94*** (2.598)
Observations	288	144	272	272
R^2	0.211	0.192	0.222	0.223

Table 2: OLS regressions of confidence on task scores and treatment dummies. “Dominant” and “Lie av.” are dummy variables that takes the value 1 if the personality score is above the median. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.



(a)



(b)

Results

- Prior confidence about 50% higher among contestants
- Unbiased feedback lowers in both groups, but much less so among contestants: posterior confidence more than twice as high as for controls
- Higher self-confidence (instrument = noise in feedback signal) leads to large increase in employer evaluations / hiring when employers not given lie detection tutorial (coefficient = .6)
- When employees are trained, effect disappears, ability (true performance) is what matters most for evaluations. When contestants are warned about training, neither ability nor confidence affects evaluations.

Motivated Beliefs in the Moral Domain

- Di Tella, Perez-Truglia, Babino, and Sigman (AER 2015): Conveniently Upset: Avoiding Altruism by Distorting Beliefs About Others' Altruism''

Figure I: Distribution of Actions and Beliefs by Treatment Group, Basic Game

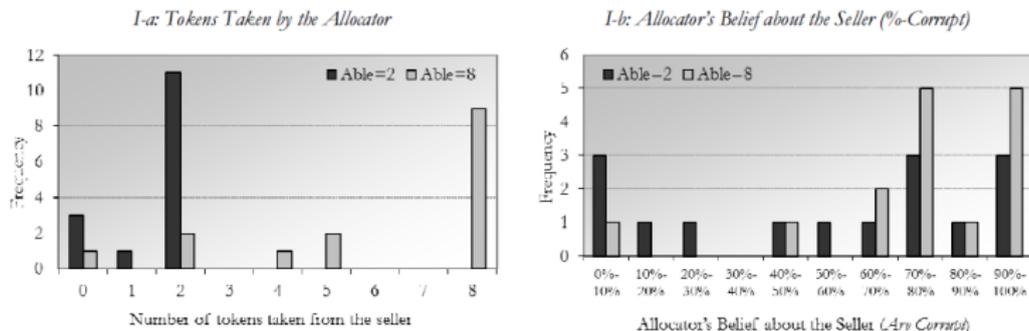
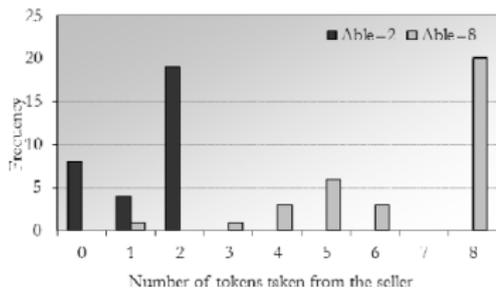
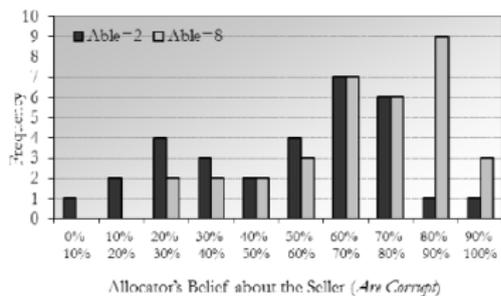


Figure II: Distribution of Actions and Beliefs by Treatment Group, Modified Game

II-a: Tokens Taken by the Allocator



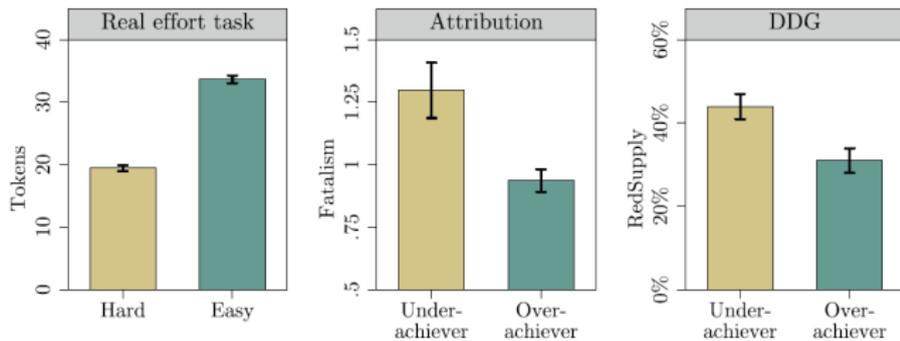
II-b: Allocator's Belief about the Seller (%-Corrupt)



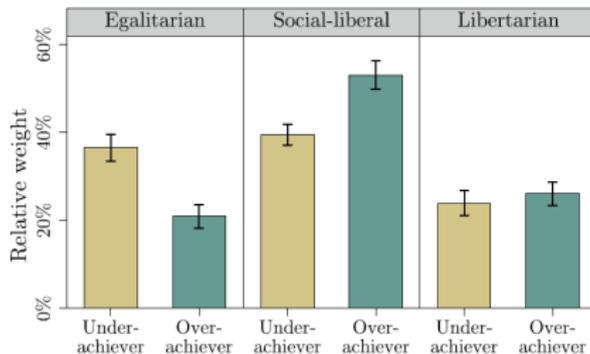
Motivated Beliefs in the Moral Domain

- Deffains, Espinosa & Thöni (JPubE 2016) “Political Self-Serving Bias and Redistribution”
- 6 session, 24 participants each. First, do real effort task, randomly made to be easy or difficult. Told it could be either, but not which. Main determinant of performance is thus randomized.
- Then, answer six questions as to whether think their performance is due to (three) task features, or (three) individual inputs: effort, will, attention and focus.
- Then, play third-person dictator game: reallocate money between an over and an underachiever (not oneself)

- Redistribution not involving oneself

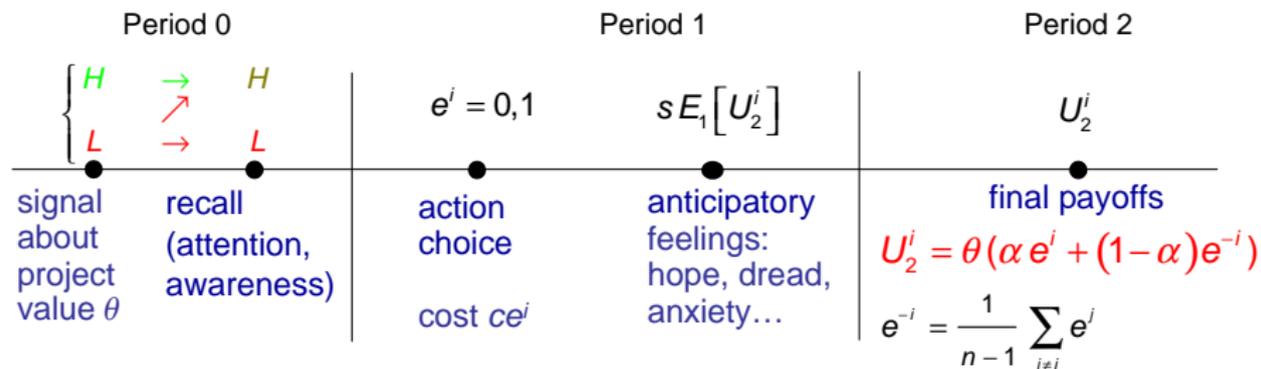


- **Redistribution involving oneself** told will perform another task of same type: uncertain about what it is, how good will be at it
- To performance is added some random noise: luck
- Vote over weights to give to each of three systems, to determine how will be paid:
 - ▶ Libertarian: paid according to final, risky payoffs
 - ▶ Social-Liberal: paid according to performance, without noise
 - ▶ Egalitarian



IV - Social Beliefs / Cognition

- “Groupthink: Collective Delusions in Organizations & Markets” (B. 2013)
- What **interaction structures** lead (mis)beliefs to **spread**, or on the contrary to dampen across agents?
 - ▶ Will do here with anticipatory utility but more general



- Take here simplest interaction / organization structure; can enrich substantially (e.g., asymmetries)
- Stakes now **endogenous**: $\kappa_\sigma^i = \theta_\sigma(1-\alpha)e_\sigma^{-i}$, $\sigma = H, L \Rightarrow$

Group Morale vs. Groupthink

- My fate now depends in part on how others respond to bad news \Rightarrow

$$\frac{\partial(\text{value of denial})}{\partial(\% \text{ of deniers})} \sim s \times \underbrace{(1 - \alpha)(0 - \theta_L)}_{\text{losses incurred from others' delusions}}$$

- When reality avoidance by others is **beneficial** (positive externalities θ_L), individual cognitive strategies are strategic **substitutes**
 - ▶ Others' disregard of bad news makes such news **less bad**, easier to accept
- When reality avoidance by others is **detrimental** (negative externalities θ_L), individual cognitive strategies are strategic **complements**
 - ▶ Others' reality denial makes future prospects even **worse**, so bad news more scary, harder to face

Proposition (groupthink)

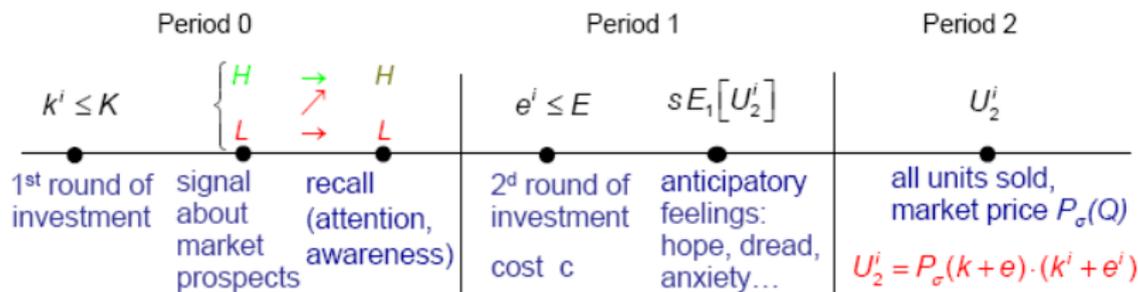
- ① *Collective realism and collective denial are both equilibria when*

$$\text{Prob}(\text{state } L) \times (\theta_H - \theta_L) < \underbrace{(1 - \alpha)(0 - \theta_L)}_{\text{losses incurred from others' delusions}}$$

- ② *Groupthink more likely when more “common fate”, few exit options ($\alpha \downarrow$); more tail risk, worse bad news ($1 - q \downarrow \theta_L \downarrow$): “black swans”.*

- Culture of denial: all persist in wrong course of action, ignoring the red flags –because others do (thereby making reality worse for everyone)
- Hierarchies: top-down groupthink
 - ▶ An agent i 's realism / denial tradeoff influenced most by how key contributors to his welfare deal with bad news
 - ▶ Simple hierarchy: agent 1 = manager, 2 = worker(s). Manager delusions (e.g., overinvestment, overborrowing) hurt workers \gg the reverse \Rightarrow
- Cognitive dependency: in a hierarchy, cognitive strategies of realism vs. denial, and hence beliefs, trickle down from leaders to subordinate

V - “Irrational Exuberance” in Asset Markets



- Investors linked by final price, resulting from:
 - ▶ State of demand θ
 - ▶ Total supply built up at $t = 0, 1$ and “unloaded” on the market at $t = 2$.
 - ★ Does other market participants’ exuberance (denial of bad news) make each individual more or less likely to also be bullish ?
- General obliviousness to weak fundamentals will further depress the (expected) final price: **Glut, market crash** \Rightarrow two effects:
 - ▶ **Substitutability:** if i remains bullish, will lose even more money
 - ▶ **Stakes:** if bearish, even greater capital losses must be immediately acknowledged on outstanding position k^i

Implications

- **Escalating commitment / sunk cost effects:** the more agent i has invested to date (k^i), the more likely he is to continue “blindly” / the less likely to be a realist
- **Market momentum:** the greater was *aggregate* prior investment (K), the more likely each agent is to continue investing “blindly”

Proposition (market manias and crashes)

Over appropriate range of parameters:

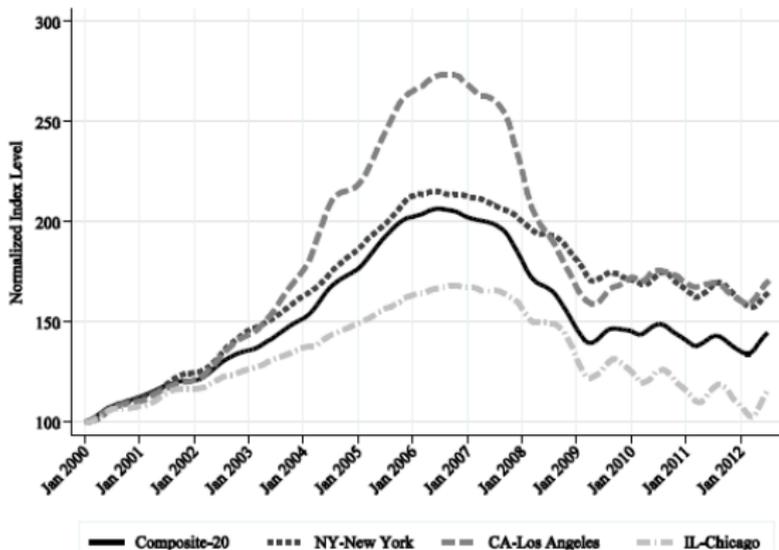
- 1 *A given asset market can have phases (equilibria) of realism and phases of blind “exuberance” in the face of bad news*
- 2 *Market mania leads to overinvestment and eventual crash.*

“Wall Street and the Housing Bubble”

- Cheng, Raina & Xiong (2014)

Figure 1: Home Price Indices

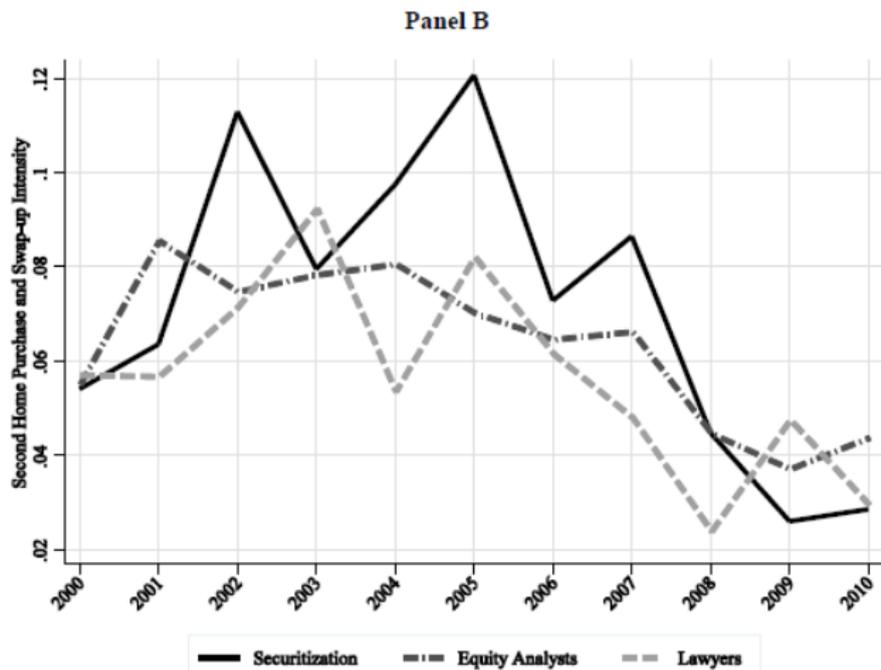
This figure plots the Case-Shiller non-seasonally-adjusted home price indices from January 2000 through July 2012. Values for January 2000 are normalized to 100.



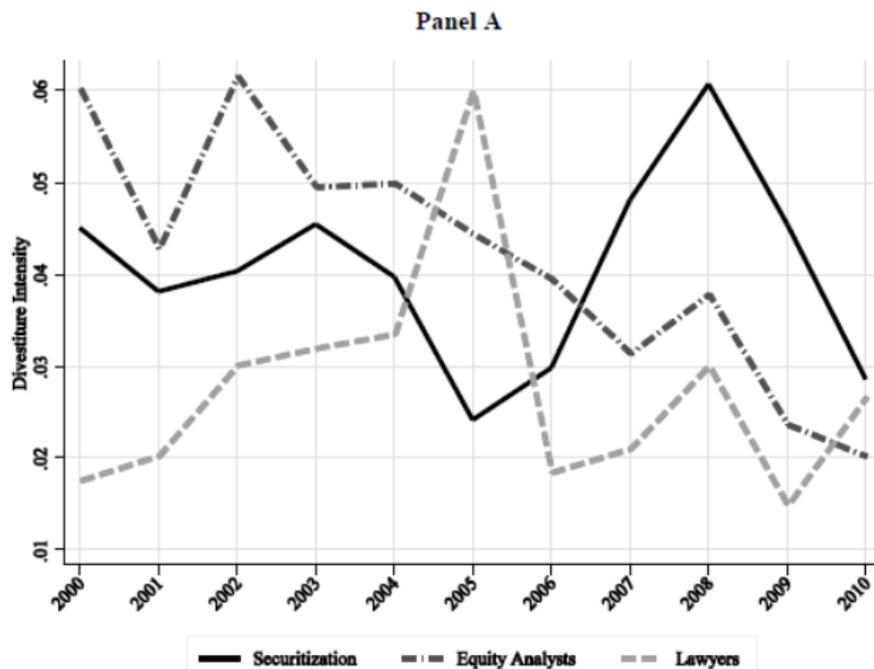
Bad Incentives or Bad Beliefs?

- **Standard account:** bad incentives led Wall Street to take excessive risks in the housing market, with disastrous consequences: securitizing mortgages with very lax screening of subprime borrowers, liar loans, etc.
 - ▶ Unscrupulous insiders, **knowingly deceiving** households, banks, investors
- But: what did insiders **really believe?** Can we tell?
- Identify + track down **own housing transactions** of 400 securitization managers, issuers, investors: **“securitization agents”** comprising vice presidents, senior vice presidents, managing directors, and other non-executives at major investment houses and boutique firms
- Control groups:
 - ▶ S&P 500 equity analysts who do not cover homebuilding companies
 - ▶ Random sample of lawyers who did not specialize in real estate law.

Second-home purchases



Home divestitures (sales)



Key findings

- Securitization agents **increased** rather than decreased, their housing exposure during the boom period, particularly through second home purchases and swaps of existing homes into more expensive homes
- Were also much **slower to sell** once prices had started falling
- Difference not explained by interest rates or financing, and is more pronounced in bubblier Southern California vs. New York metro region
- Accords well with **stakes-dependent beliefs**
- As a result, securitization agents' overall home portfolio performance was **significantly worse** than that of control groups
- Agents working on the **sell side** and for firms which had poor stock price performance through the crisis did particularly poorly themselves.

Political Ideology

- Endogenous complementarities in motivated cognition help explain persistent differences across countries in dominant beliefs about:
- Role of effort vs. luck in life, social mobility, merits of laissez-faire versus redistribution: Bénabou-Tirole (QJE 2006).
 - ▶ Individual demand for beliefs that "effort pays," "just deserts", etc. serves to motivate oneself or one's children
 - ▶ Model also applies to values for consumption vs. leisure (degree of "materialism") and some key aspects of religion. (e.g., divine rewards and punishments)
- Proper scope / effectiveness of State vs. Market in the financing and delivery of education, health insurance, etc.: Bénabou (JEEA 2009).
 - ▶ Individual demand for beliefs consistent with dominant ideology/ policies ("system justification") due to anticipatory utility, MAD principle
 - ▶ Besides multiple ideology-policy steady states, yields history-dependent dynamics, via stocks of public vs. private capital.

Political Ideology

- Le Yaouanq (2016): adds within-country heterogeneity of preferences \Rightarrow also of beliefs (stakes dependence)
 - ▶ Agents with more extreme preferences engage in more cognitive distortion, so end up more overconfident in their opinions. Matches evidence by Ortoleva and Snowberg (2015a,b)
- Levy (JPubE 2014): adds politicians whose willingness to engage in costly reform depends + feeds back on the extent to which voters accept to face bad news
 - ▶ Yields realistic + "soothing politics" equilibria

● Oliver & Wood AJPS 2014 “Conspiracy Theories and the Paranoid Style(s) of Mass Opinion”

- ▶ Four nationally representative surveys in 2006, 2010, 2011 as part of Cooperative Congressional Election Studies (CCES)

Conspiratorial Narrative	Heard Before?	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
The U.S. invasion of Iraq was not part of a campaign to fight terrorism, but was driven by oil companies and Jews in the U.S. and Israel (<i>Iraq War</i>)	44	6	13	33	22	27
Certain U.S. government officials planned the attacks of September 11, 2001, because they wanted the United States to go to war in the Middle East (<i>Truther</i>)	67	7	12	22	18	41
President Barack Obama was not really born in the United States and does not have an authentic Hawaiian birth certificate (<i>Birther</i>)	94	11	13	24	14	38
The current financial crisis was secretly orchestrated by a small group of Wall Street bankers to extend the power of the Federal Reserve and further their control of the world's economy (<i>Financial Crisis</i>)	47	8	17	38	20	17
Vapor trails left by aircraft are actually chemical agents deliberately sprayed in a clandestine program directed by government officials (<i>Chem Trails</i>)	17	4	5	28	21	42
Billionaire George Soros is behind a hidden plot to destabilize the American government, take control of the media, and put the world under his control (<i>Soros</i>)	31	9	10	44	16	21
The U.S. government is mandating the switch to compact fluorescent light bulbs because such lights make people more obedient and easier to control (<i>CFLB</i>)	17	4	7	24	24	41

Note: N = 1,935 cases.

Source: Modules of the 2011 Cooperative Congressional Election Surveys.

Main results and implications - collective beliefs

- 1 **MAD principle:** denial is contagious when it is socially harmful.
- 2 Collective realism and collective wishful thinking as **equilibrium cultures** in firms, organizations. Group morale vs. groupthink.
- 3 **Hierarchies:** cognitive strategies and hence **beliefs trickle down** from leaders to subordinates
- 4 **Cassandra's curse:** ex ante vs. ex post treatment of dissenting speech, implying need for “constitutional” guarantees.
- 5 **Market frenzies and crashes:** contagious wishful thinking about prices, fundamentals.
- 6 **Ideology:** national beliefs about, e.g., compared virtues of laissez-faire versus redistribution, or state vs. markets in financing/delivery of education, health insurance, etc. Feedback is through **voting**.

VI - Open Questions

- Need more / complementary evidence on self-deception, in the lab and maybe especially in the field
- Beyond populations averages: differences between individuals, e.g., self-deceivers vs. realists. Stable over time, circumstances, carries across domains? Tradeoff across domains? Other correlates?
- What is still missing?
 - ▶ Other motives, other mechanisms not yet captured?
 - ▶ Conversely, "aggregating" too much, missing finer but important psychological or cognitive distinctions, e.g.: attention vs. memory, rationalization?
- From individual self-deception to group delusions
 - ▶ Devise experiments, clever empirical tests, etc.