

# WHY POLICY ECONOMISTS SHOULD STUDY THE DYNAMICS OF CULTURE

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# The Issues

- ▶ Economists generally uncomfortable talking about culture
- ▶ Means getting into factors that shape behavior outside of pure incentives
  - ▶ norms
  - ▶ changing values/preferences
- ▶ But difficult to think about some big shifts in society without embracing this
  - ▶ attitudes towards gender
  - ▶ smoking
  - ▶ open and tolerant societies

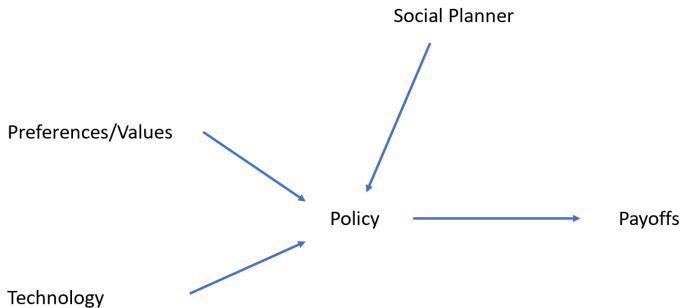
# This Presentation

- ▶ Will discuss a framework for thinking about this and use a concrete application to environmental values and policies
  - ▶ based on my forthcoming FBBVA lecture (jointly written with Torsten Persson)
  - ▶ also writing a book with Torsten on how to bring culture into policy economics/political economy
- ▶ This application can serve as a spring board for wider discussion
- ▶ It will also be useful in outlining some of the challenges.
  - ▶ so at the beginning rather than the end of an agenda.

# Economic Policy Frameworks

- ▶ Key issue for government is how to bring about desired changes through pulling policy levers
  - ▶ taxes
  - ▶ transfers
  - ▶ spending
  - ▶ regulations
- ▶ Standard approach thinks of this as influencing outcomes when set by a “planner” outside the model.

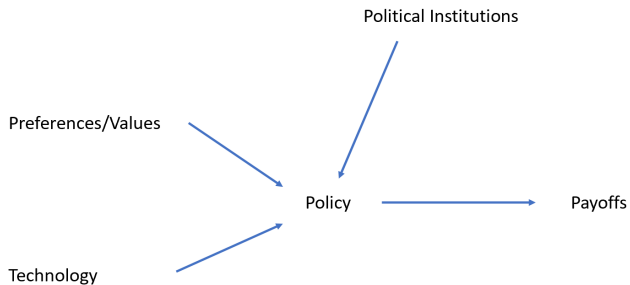
# Standard Approach



# Political economics I

- ▶ Policy is subject to political constraints
  - ▶ it needs to be incentive compatible
  - ▶ especially important for policies with long-run implications
- ▶ We can stand outside the political process and ask what make it more likely that a policy will fly with voters
  - ▶ policy narratives could be important in how people perceive their interests
  - ▶ e.g. different kinds of financing mechanisms may be met with more or less resistance

# Political Economics I

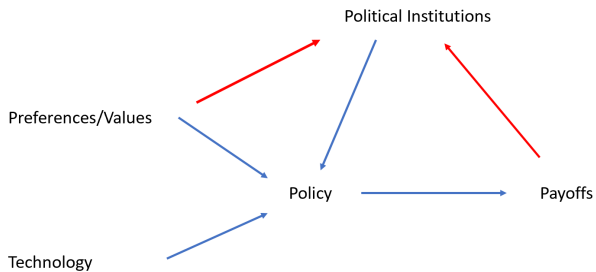


# Political Economics II

- ▶ Institutions may affect policy outcomes
  - ▶ the nature of accountability matters
  - ▶ e.g. judicial versus political processes
- ▶ Can they be designed to influence outcomes?
  - ▶ e.g. Infrastructure Australia or NIC in the UK
- ▶ Also role of federalism and supranational institutions



# Political Economics II



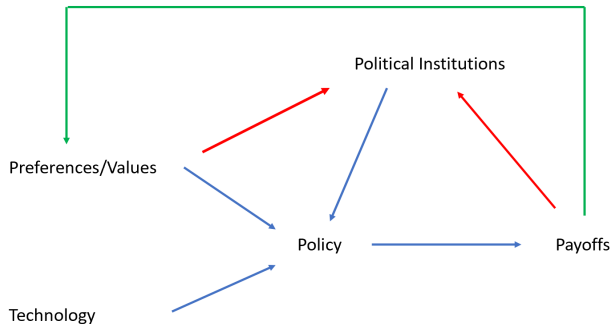
# Policy Economics with Endogenous Culture

- ▶ How to think about culture?
  - ▶ norms
  - ▶ identities
  - ▶ values
- ▶ can manifest themselves as endogenous preferences/values

## Examples

- ▶ Are you an environmentalist?
  - ▶ comes with various norms of behavior internalized in values/preferences
  - ▶ values also reflect societal outcomes affecting willingness to provide public goods
- ▶ Are you a cosmopolitan?
  - ▶ how far do you care about global rather than local policies?

# Endogenous Culture



# Environmentalism

- ▶ people have heterogeneous values regarding the environment, which relate to their preferences
- ▶ these values differ systematically across generations and societies

## World Value Survey (WVS)

- ▶ values: question posed in four waves, "would you prioritize environment over economic growth"?
- ▶ answered by 250,000 people, 54 percent say yes – code as environmentalists
- ▶ policy preferences: posed in four waves, "increase in taxes if used to prevent environmental pollution"?
- ▶ answered by 190,000, 44 percent "strongly agree" or "agree" – code as favorable preferences

# Study individual and cross-country variation

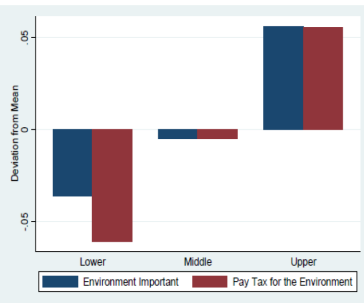
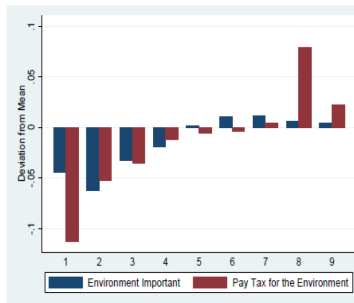
## Clear patterns in the data

- ▶ Figure 1: environmental values and preferences stronger among later cohorts and more educated
- ▶ Figure 2: values and preferences both show stark variation across countries
- ▶ Figure 3: values and preferences positively correlated

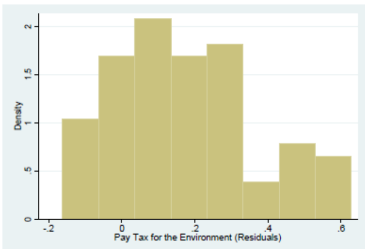
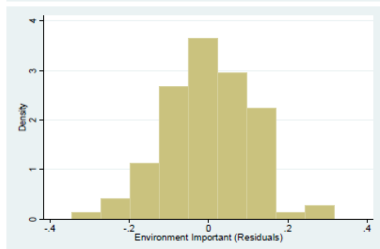
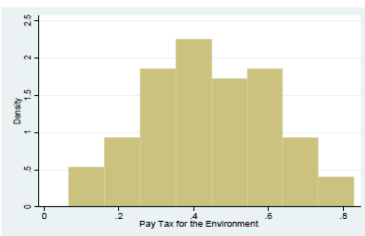
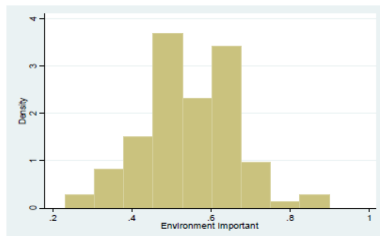
## Variation has micro and macro components

- ▶ differences across generations and countries underpin assumptions and implications of model to come

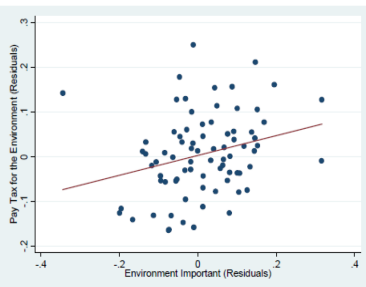
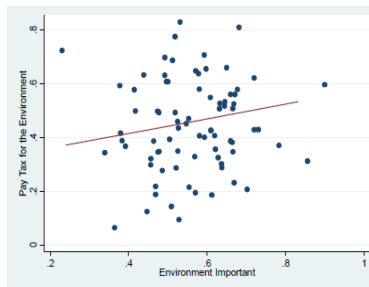
# Values by birth decade and education



# Cross-country variation



# Correlation: values and policy preferences



Variation in data has micro and macro components

- ▶ differences across generations and countries square with assumptions and implications of our model.



# Points of departure

## Normative approaches to pollution (climate change)

- ▶ economists: influence incentives to change behavior (e.g., Pigouvian taxes)
- ▶ activists: influence values to change behavior directly, or indirectly (via political process and policy)

# Much wider agenda

## Preferences partly socially determined

- ▶ standard and classical idea in sociology
  - ▶ such as Talcott Parsons who viewed families as “factories” for determining values and preferences
- ▶ Among economists: Bowles 1998, Bisin-Verdier 2001
- ▶ Cultural evolution in anthropology: Boyd-Richerson 1985, Cavalli-Sforza-Feldman 1981
  - ▶ although what is the “fitness” criterion that drives culture?
  - ▶ material versus non-material aspects

# Illustrative Framework

## Heterogeneous population of environmentalists and materialists

- ▶ interact via markets and through politics
  - ▶ environmentalists engage in virtue signalling
- ▶ policy affects incentives to pollute à la Pigou
  - ▶ (no direct attempt to influence culture)
  - ▶ Pigouvian tax chosen via a political process (which turns out to be Utilitarian)
- ▶ determines relative payoffs of environmentalists and materialists
  - ▶ affects the cultural evolution process and hence subsequent politics
- ▶ look at the dynamic path taken by the economy and the level of pollution

# Basic economics

Consider a given period  $s$

- ▶ normalize population to 1
- ▶ two types (social identities)  $\tau \in \{m, e\}$ , materialists and environmentalists, given shares  $1 - \mu_s$  and  $\mu_s$  – types only indirectly observed
- ▶ everybody has same income  $y$
- ▶  $c$  polluting good (think carbon emissions), taxed at  $t$
- ▶  $n$  non-polluting, given relative price  $p \geq 1$
- ▶ budget constraint for both groups

$$y + r = c(1 + t) + pn$$

where  $r$  is (per-capita) government transfer

# Materialists

## Preferences

$$u^m = \log(Ac) + n - \lambda C$$

- ▶  $C$  aggregate consumption (taken as given),  $\lambda$  pollution externality
- ▶ given budget constraint, optimal consumption is

$$\hat{c}(t, p) = \arg \max_c \left\{ \alpha + 1 + \log(c) + \frac{y + r - (1+t)c}{p} \right\} = \frac{p}{(1+t)}$$

where  $\alpha = \log(A) - 1$

Indirect utility *from good c*

$$v(t, p) = \alpha + \log\left(\frac{p}{(1+t)}\right)$$

# Environmentalists

## Preferences

$$u^e = n - (\lambda + \theta)C + V(\mu),$$

- ▶ environmentalists put extra weight  $\theta$  on pollution – and have no utility from  $c$ , so set  $c = 0$

## "Virtue utility" (Benabou-Tirole 2006)

- ▶  $V(\mu)$  captures perceptions of environmentalism
- ▶  $c = 0$  observed,  $c > 0$  *not* observed with prob  $\rho$
- ▶ if observe  $c = 0$ , think environmentalist with prob  $\varphi(\mu)$ , increasing from  $\varphi(0) = 0$  to  $\varphi(1) = 1$ , by Bayes Rule

$$\varphi(\mu) = \frac{\mu}{(1 - \mu)\rho + \mu}$$

- ▶ set  $V(\mu) = \chi\varphi(\mu)$  – linked to environmentalist share

## Policy preferences

Close the model

- ▶ suppose tax revenue rebated to consumers  $r = Ct$ , and impose equilibrium  $C = (1 - \mu)\widehat{c}(t, p)$
- ▶ set  $p = 1$  (bit more than normalizing)

Type-dependent policy preferences

$$u^\tau(t, \mu) = \begin{cases} \chi\varphi(\mu) - (\lambda + \theta - t)(1 - \mu)\widehat{c}(t) + y & \tau = e \\ v(t) - (\lambda - t)(1 - \mu)\widehat{c}(t) + y & \tau = m \end{cases}$$

- ▶ as  $v(t)$  decreasing and  $\theta > 0$ , environmentalists prefer higher  $t$  than materialists

Assumption on parameters

$$\alpha + \log\left(\frac{1}{1 + \lambda + \theta}\right) < 0 < \alpha + \log\left(\frac{1}{1 + \lambda}\right)$$

- ▶ pollution-damage weight differs enough for  $\tau = e$  and  $m$

# Basic politics

Two Downsian parties

- ▶  $A, B$ , propose platforms  $t^A, t^B$  in election at  $s$ , to maximize chance to win

Variant of probabilistic voting model

- ▶ loyal and swing voters, same shares among each type – type- $\tau$  swing voter votes for  $A$  if

$$u^\tau(t^A, \mu) + \varepsilon + \zeta \geq u^\tau(t^B, \mu)$$

- ▶  $\varepsilon$  idiosyncratic shock,  $\zeta$  aggregate shock
- ▶ uniformly distributed:  $\varepsilon$  on  $[-1/\epsilon, 1/\epsilon]$ ,  $\zeta$  on  $[-1/\psi, 1/\psi]$
- ▶ this simple model – with specific assumptions on utility – has closed-form solution for policy



# Probabilities of winning

Standard steps in probabilistic voting

- ▶ party  $A$  wins election with probability

$$q^A = \frac{1}{2} + \psi \Omega(t^A, t^B, \mu)$$

where

$$\Omega(t^A, t^B, \mu) = \frac{\mu [u^e(t^A, \mu) - u^e(t^B, \mu)]}{\mu [u^e(t^A, \mu) - u^e(t^B, \mu)] + (1 - \mu) [u^m(t^A, \mu) - u^m(t^B, \mu)]}$$

- ▶ party  $B$  wins with probability  $q^B = 1 - q^A$
- ▶  $A$  and  $B$  effectively set policy to maximize same Utilitarian SWF

# Political equilibrium

**Proposition 1** *Both parties pick the same tax rate:*

$$t^A = t^B = \hat{t}(\mu) = \lambda + \mu\theta$$

## Observations

- ▶ lowest tax rate is  $\hat{t}(0) = \lambda$  – conventional Pigouvian tax when only materialists; positive  $\mu \rightarrow$  higher tax
- ▶ when  $\mu = 1$ ,  $\hat{t}(1) = \lambda + \theta$
- ▶ define equilibrium utility for type  $\tau$  at share  $\mu$

$$u^\tau(\mu) = u^\tau(\hat{t}(\mu), \mu)$$

$u^e(\mu)$  rises, but  $u^m(\mu)$  falls, in  $\mu$  – politicians weigh environmentalist preferences more

## Timing in period $s$

Now allow  $\mu$  to be endogenous

1. Society enters  $s$  with share  $\mu_s$  of environmentalists in current generation
2. Parties offer policy platforms  $\{t^A, t^B\}$
3. Individual and aggregate shocks  $\varepsilon$  and  $\zeta$  realized
4. Election held, where party  $A$  wins with probability  $q^A$
5. Policy implemented, economic choices made, and payoffs realized
6. Next generation of citizens decide to identify as environmentalists or materialists. This determines  $\mu_{s+1}$

## "Cultural fitness" of environmentalism

Expected payoff difference of having  $\tau = e$  vs  $m$  at  $s + 1$

- ▶ given economic (social) choices, can write

$$\Delta(\mu_{s+1}) = \chi\varphi(\mu_{s+1}) - v(\hat{t}(\mu_{s+1})) - \theta(1 - \mu_{s+1})\hat{c}(\hat{t}(\mu_{s+1}))$$

Dynamic complementarity

- ▶ straightforward to compute

$$\Delta_{\mu}(\mu) = \chi\varphi_{\mu}(\mu) - [v_t(\hat{t}(\mu)) + \theta(1 - \mu)\hat{c}_t]\hat{t}_{\mu} + \theta\hat{c} > 0$$

- ▶ social signal more effective, and pollution taxes higher ( $v$  and  $c$  lower), as environmentalism more common

# Darwinian dynamics

## Dynamics of social identification

- ▶ shares depend on psychological fitness
- ▶ can use specific microfoundation built on forward-looking socialization to derive

$$\mu_{s+1} = \mu_s + 2\mu_s (1 - \mu_s) (1 - \beta) \left[ G(\Delta(\mu_{s+1})) - \frac{1}{2} \right]$$

- ▶  $\beta$  rate of assortative mating,  $G$  symmetric c.d.f. of idiosyncratic family shock in mixed marriages with  $G(0) = \frac{1}{2}$  and p.d.f.  $g$

If make weak assumption

$$1 - 2\mu (1 - \mu) (1 - \beta) g(\Delta(\mu)) \Delta_\mu(\mu) > 0$$

- ▶ this rules out stable interior steady state

# Dynamics and steady states

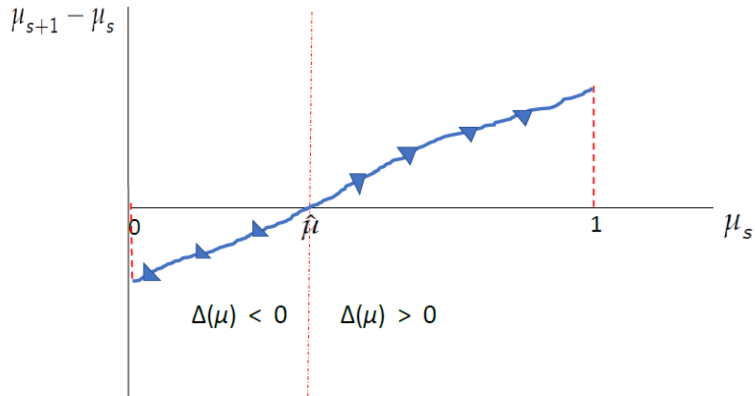
Three observations and their consequences

- ▶ as  $\mu \rightarrow 0$ ,  $\varphi(\mu) \rightarrow 0$  and  $\Delta(0) < 0$
- ▶ as  $\mu \rightarrow 1$ ,  $v(\hat{t}(1)) \rightarrow \alpha + \log\left(\frac{1}{1+\lambda+\theta}\right)$  and  $\Delta(1) > 0$
- ▶ as  $\Delta(\mu)$  smoothly increasing, must exist  $\hat{\mu}$  where  $\Delta(\hat{\mu}) = \chi\varphi(\hat{\mu}) - \theta(1 - \hat{\mu})\hat{c}(\hat{t}(\hat{\mu})) + v(\hat{t}(\hat{\mu})) = 0$
- ▶ steady states at  $\mu = 0$  and  $\mu = 1$  stable, but  $\mu = \hat{\mu}$  unstable

**Proposition 2** *If  $\mu_0 > \hat{\mu}$ , society converges monotonically to steady state  $\mu = 1$ . If not, it converges monotonically to  $\mu = 0$*

- ▶ dynamics hinge on sign of  $\Delta(\mu)$  – positive (negative) if  $\mu > \hat{\mu}$  ( $\mu < \hat{\mu}$ )
- ▶ complementarity drives environmentalist share  $\mu$  to 1 (to 0), where no (only) materialists and zero (maximal) pollution

# Graphic illustration of dynamics



# Implied dynamics

## Changing environmentalist sentiment in politics

- ▶ if  $\mu > 0$ , pollution tax higher than  $t(0) = \lambda$  benchmark (when everyone materialist)
- ▶ tax gap responds to evolution of types and feeds back to this evolution

$$t_{s+1} - t_s = \theta [\mu_{s+1} - \mu_s]$$

- ▶ two-way link between values and policy relates environmental policy to share of environmentalists, but not causal relation in unidirectional sense

## Possible amplifying forces – as in Besley-Persson (2019b)

- ▶ endogenous social movements – think Gilets Jaunes, Extinction Rebellion, or Greta Thunberg strikes – may reinforce such dynamics
- ▶ so can endogenous Green-party entry



# Welfare

Welfare analysis with endogenous preferences is challenging, but interesting

- ▶ when can we say that society with more of one type is better off in well-defined sense?

Social welfare function

$$W(u^e, u^m, \mu) = \mu \omega(u^e(\mu)) + (1 - \mu) \omega(u^m(\mu))$$

- ▶  $\omega(\cdot)$  increasing and concave – if linear, Utilitarian case
- ▶ working with  $W$  assumes payoffs can be compared, but Darwinian approach already assumes citizens do via  $\Delta(\mu)$

Standard approach fails

- ▶ would say Pigouvian tax maximizes feasible welfare
- ▶ but may fail when values are endogenous
- ▶ have to ask if society of environmentalists happier if pollution externality fully eliminated, not just mitigated

# Compare possible steady states

Alternative long-run welfare levels

$$W(u^e, u^m, 1) = \omega(\chi + y) \quad \text{and} \quad W(u^e, u^m, 0) = \omega(v(\hat{t}(0)) + y)$$

**Proposition 3** *Welfare in two steady states depend on parameter values:*

1. *If  $\alpha < \chi$ , welfare is always higher with  $\mu = 1$*
2. *If  $\alpha \geq \chi$ , there is a threshold value  $\lambda$  such that welfare highest with  $\mu = 1$  – i.e.,  $\chi > v(\hat{t}(0)) = \alpha + \log\left(\frac{1}{1+\lambda}\right)$  above this threshold*
  - ▶ Case 1: virtue of environmentalism strong enough that welfare higher in all-environmentalist population
  - ▶ Case 2: if  $\lambda = 0$ , materialism better (no tax needed), but higher  $\lambda$  imposes higher tax on materialists – at some point, welfare higher with zero  $c$  in all-environmentalist population

# A failure of democratic politics?

## Suboptimal steady states

- ▶ this follows from Propositions 2 and 3
- ▶ e.g., if  $\alpha < \chi$  and  $\mu_0 < \hat{\mu}$  society converges to suboptimal  $\mu = 0$  ; same is true if  $\alpha > \chi$ , and  $\lambda$  high enough

## Mechanical driver

- ▶ welfare comparisons involve long-run welfare levels, while value dynamics reflect short-run welfare differences
- ▶ if start "in the wrong place" may end up in the wrong place

## Commitment Issues

Source of long-run suboptimality is inability to commit due to the nature of the political process

- ▶ incumbent policy-maker, and private actors, at  $s$  take as given  $\hat{t}(\mu_{s+1})$ , which governs value formation
- ▶ suppose  $\mu = 1$  best steady state – consider long-run oriented policy-maker who can commit to *constant* tax  $\tilde{t} \gtrless \hat{t}(1)$ , unconstrained by politics
- ▶ credible  $s + 1$  commitment to  $\tilde{t}$  would change value dynamics

$$\Delta(\mu_{s+1}) = \chi\varphi(\mu_{s+1}) - v(\tilde{t})$$

**Proposition 4** *If society can commit to constant tax, exists  $\tilde{t}$  such that it will converge to  $\mu = 1$  for  $\mu_0 \in [0, 1]$*

Implications for institution design?

- ▶ society concerned with long-run welfare, may want to institutionally delegate policy
- ▶ but delegation itself must be credible – cf. central bank independence a la Rogoff (1985)

# Extensions

## Social and political amplification

- ▶ introduce endogenous organizations: social movements and/or political parties, which would interact with evolving values and policies

## Endogenous public socialization

- ▶ empirically, environmentalism and policy preferences vary with education
- ▶ can be exploited in public education systems – or in publicly-regulated media – in both directions (raise or cut  $\mu$ )

## Dynamic models of economy and society

- ▶ dynamics of climate change or technologies may allow current policy-makers to strategically affect future political equilibria via state variables

# More general messages?

Policy-making can interact with evolution of values

- ▶ other applications than environmental policy

Welfare analysis with endogenous values

- ▶ introduce tricky but interesting questions

Cultural evolution of values

- ▶ may not converge to long-run optimum
- ▶ raises familiar issues of alternative institution design

Economists slow to embrace endogenous values

- ▶ reluctance neglects important aspect of policy-making

# Other applications

- ▶ The rise of identity politics
  - ▶ shift away from class-based politics
- ▶ Norms of compliance
  - ▶ do citizens pay their taxes (blurs the distinction between avoidance and evasion)
- ▶ Democratic values
  - ▶ are western liberal ideas under pressure

# Concluding Comments

- ▶ We can bring culture into our models
- ▶ Gives a new source of dynamics
- ▶ But how to promote culture change remains open
- ▶ Two key dimensions
  - ▶ cultural consequences of conventional policies
  - ▶ direct efforts at cultural change
- ▶ But this is can be handled in economic models of policy-making