Evolution & Learning in Games
Econ 243B

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Beyond the Melting Pot:
Cultural Transmission, Marriage and the Evolution of
Ethnic and Religious Traits (2000 QJE)
Alberto Bisin and Thierry Verdier
The Melting Pot

- Prior to the 1960s, it was conventional wisdom among social scientists that immigrants from various ethnic and religious backgrounds would assimilate into American culture.

- It became obvious that this was not occurring not only in America, but elsewhere.

- High rates of homogamy persisted along with distinctive cultural traits:
  - Basque and Catalan culture in Spain,
  - Ultra-Orthodox Judaism in New York,
  - Conservatives and liberals in the United States,
  - Working class culture in Britain.
The Melting Pot

• Consider a simple baseline model of cultural transmission.

• Agents form a continuum and can have either cultural trait $a$ or $b$.

• Each parent (asexually) produces one child, socializes them and then dies.

• With probability $\tau^i$ a parent with trait $i \in \{a, b\}$ successfully passes on her trait to her child (vertical transmission).

• With probability $1 - \tau^i$ the child is matched at random with someone from her parent’s generation and acquires their trait (oblique transmission).
The Melting Pot

- Let $q$ equal the proportion of type $a$ individuals in the population.

- The probability that a type $b$ individual has a type $a$ child is $(1 - \tau^b)q$.

- The probability that a type $a$ individual has a type $b$ child is $(1 - \tau^a)(1 - q)$.

- In continuous time the dynamic is:

\[
\dot{q} = (1 - q)(1 - \tau^b)q - q(1 - \tau^a)(1 - q)
\]

\[
= (\tau^a - \tau^b)q(1 - q).
\]
The Melting Pot

• We have a melting pot, i.e. a monomorphic cultural equilibrium:
  
  • $q = 1$ is globally asymptotically stable if $\tau^a > \tau^b$.
  
  • $q = 0$ is globally asymptotically stable if $\tau^b > \tau^a$.

• How can we get cultural diversity, i.e. a polymorphic cultural equilibrium?
Endogenous Socialization

- Bisin and Verdier’s contribution is to introduce a choice of socialization effort. For example:
  - teaching,
  - school choice,
  - residential choice,
  - homogamy.
Imperfect Empathy

• To model socialization choice, parents need to have preferences over the traits that their children can acquire.

• Parents are **imperfectly empathetic**: they evaluate their children’s behavior based on their own preferences.

• Formally, a parent with trait $i$ gets a payoff of $V^{ij}$ if their child acquires trait $j$, where $V^{ii} > V^{ij}$ whenever $i \neq j$. 
Objective Functions

- A parent with trait $a$ in state $q$ has utility function:

\[ U^a(q) = [\tau^a + (1 - \tau^a)q] V^{aa} + (1 - \tau^a)(1 - q) V^{ab} - c(\tau^a). \]

They choose socialization effort $\tau^a$ at cost $c(\tau^a)$ to maximize this function.

- A parent with trait $b$ in state $q$ has utility function:

\[ U^b(q) = [\tau^b + (1 - \tau^b)(1 - q)] V^{bb} + (1 - \tau^b)q V^{ba} - c(\tau^b). \]
First-Order Conditions

• The FOC for an $a$ type is:

$$(1 - q)(V^{aa} - V^{ab}) = c'(\tau^a).$$

• The FOC for a $b$ type is:

$$q(V^{bb} - V^{ba}) = c'(\tau^b).$$
Optimal Socialization Effort

**Proposition 1.** Optimal socialization effort varies as follows:

(i) $\tau^i$ is strictly increasing in ‘cultural intolerance’ $V^{ii} - V^{ij}$,

(ii) $\tau^a$ is strictly decreasing in $q$,

(iii) $\tau^b$ is strictly increasing in $q$,

(iv) $\tau^a > \tau^b$ if and only if $q < \frac{V^{aa} - V^{ab}}{V^{aa} - V^{ab} + V^{bb} - V^{ba}}$.

Hence ‘minorities’ expend more effort on socialization.
Dynamics

Population dynamics are given by (1) except that now $\tau$ is endogenous.

**Proposition 2.** The process converges to the interior steady state

$$q^* = \frac{V^{aa} - V^{ab}}{V^{aa} - V^{ab} + V^{bb} - V^{ba}}$$

from any $q \in (0, 1)$.

Therefore, a polymorphic cultural distribution emerges from almost every initial state.