Cultural Transmission Models

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Abstract

Bisin and Verdier (2025) summarizes recent advances in modelling cutural transmission in the economics literature. I would like to depart from here to investigate what are possible path for future research topic and question.

1 Canonical Model of Cultural Transmission

1.1 Transmission Technology

Assume that cultural transmission is intergenerational, and there are only two cultural traits i and j. Assume that population size is normalized to 1. There are two channels for intergenerational cultural transmission: *direct vertical* or *parental* transmission, and *oblique* or *social* transmission. For the first channel, there is a probability of d^i for a child to be socialized to cultural trait i by a trait i parent. The residual probability $1 - d^i$ is for the second channel. A child is randomly matched to a member of the parental generation and is socialized to his/her trait. Conditioanl on being socialized via the social transmission channel (with probability $1 - d^i$), the probability of a child to be socialized to trait i is q^i. **Note that if a child's parent is of trait i, then the child can ONLY be socialized to trait i, while she can be socialized to $j \neq i$ only via the social channel.**

Let P^{ij} denote the transition probability that a child is socialized to trait j with trait i parent. Then the cultural transmission technology is represented by

$$P^{ii} = d^i + (1 - d^i)q^i, \qquad P^{ij} = (1 - d^i)(1 - q^i). \tag{1}$$

Then the discrete time dynamics, by Law of Large numbers, will be

$$\Delta q^i_{t+1} = (1 - q^i_t)P^{ji}_t - q^i_t P^{ij}_t.$$

In continuous time, we get the *logistic equation*:

$$\dot{q}^i = q^i(1 - q^i)(d^i - d^j), \tag{2}$$

where $d^i - d^j$ reflects the difference in parental rates. Define $f^i \equiv d^i - d^j$ to be the *relative cultural fitness*.

1.2 Choice

A parent with trait i get payoff V^{ij} if her child acquires trait j. Assume that $V^{ii} > V^{ij}$. A rational parent chooses the transmission rate d^i, facing a cost of $c(d^i)$ which increases with d^i and is convex. The expected parental payoff is $P^{ii}V^{ii} + P^{ij}V^{ij}$, where P^{ii} and P^{ij} are defined by (1). Note that this can be reduced to $V^{ij} + P^{ii}\Delta V^i$, where $\Delta V^i = V^{ii} - V^{ij}$. The

socialization choice problem is reduced to

$$\begin{aligned} \max_{d^i} \quad & P^{ii}\Delta V^i - c(d^i) \\ \text{s.t.} \quad & P^{ii} = d^i + (1-d^i)q^i. \end{aligned} \tag{3}$$

The solution is $d^i = (c')^{(-1)}\left((1-q^i)\Delta V^i\right)$. It increases with ΔV^i and decreases with q^i.

Given this socialization choice setting, we can maintain a steady state / a stable equilibrium where

$$0 < q^i < 1 \text{such that } f^i(q^i) = 0. \tag{4}$$

References

Bisin, Alberto and Thierry Verdier, "Economic Models of Cultural Transmission," *NBER Working Paper*, June 2025, *33928.*