Summary of Altruism, Egoism, and Genetic Fitness: Economics and Sociobiology

Evan Zuofu Liao

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Part I
Introduction

Economists generally make analysis under the assumption that tastes are given and do not change. Among the basic properties of tastes, *self-interest* is assumed to dominate all other motives, together with some benevolence toward children. These properties have usually been explained by "human nature". It is not difficult to understand why self-interest has high survival value for human and animal, but why should *altruistic behavior* also survive?

- Sociobiologists have tried to solve this central problem by building models of "kin selection": altruism toward those who have genes in common could have high survival value
- However, this approach has relied solely on the "rationality" related to genetic selection. A model of individual rationality in which rational actors maximize utility functions subject to limited resources should be developed.

Part II
An Economic Model of Altruism

Suppose h is willing to give some of his wealth to i. The utility function of an altruist h can be written as

$$U^h = U^h(X_h, X_i) \tag{1}$$

where X_h and X_i are the own consumption of h and i. The budget constraint of h (equation 2) and i (equation 3) can be written as

$$pX_h + h_i = I_h \tag{2}$$

$$pX_i = I_i + h_i \tag{3}$$

where h_i is the dollar amount transferred to i, and I is income. Substituting (3) into (2), we get the basic budget constraint for h

$$pX_h + pX_i = I_h + I_i = S_h \tag{4}$$

where S_h is called h's "social income". The equilibrium condition is

$$\frac{\partial U^h/\partial X_h}{\partial U^h/\partial X_i} = \frac{MU_h}{MU_i} = \frac{p}{p} = 1 \tag{5}$$

This means, h would transfer just enough resources to i so that h would receive the same utility from increments to his own or to i's consumption. Then h's altruism is relevant not only to transfers of income, but also to the production of income. His utility would be increased by all increases in his social income.

- The most important consideration benefiting altruists is that egoistic i has an incentive to act "as if" he were altruistic toward h in the sense that it would be to i's advantage to raise the combined incomes of i and h. Why? Suppose the contrary, let i raise his own income at the cost of lowering h's even more. Since h's social income and utility decline, he would want to reduce his own and i's own consumption. Then h would have to reduce his transfers to i by more than the increase in i's income.
- Conclusion: even though an altruist gives away part of his income and refrains from some actions that raise his own income, his own consumption might not be less than that of an egoist. Because egoist (or beneficiaries of altruism) would consider the effect of their behavior on his consumption.
- The analysis is easily extended to multiperson case (altruism by h toward all others). The most important new consequence of multiperson altruism relates to the behavior of recipients toward each other. Each recipient has an incentive to consider the effects of his behavior on the others. Each person in the group linked by an altruist's transfers has an incentive to maximize the group's total income. Recipients of h's transfers are encouraged to act "as if" they are altruistic to each other and to h.

Part III

Genetic Fitness and the Economic Model of Altruism

Since sociobiologists are more concerned with selection and genetic fitness than with consumption and wealth per se, we can reformulate the utility function to bring out the relationship between economic analysis of altruism and the central problem of sociobiology.

$$U^h = U^h(f_h, f_i) \tag{6}$$

where f_h and f_i measure the fitness of h and i, and the utility function of egoist i would depend only on his own fitness. The fitness of h would be produced according to

$$f_h = f_h(X_h, t_h; S_h, E_h) \tag{7}$$

where t_h is the time he uses to produce fitness–as in the care and protection of children–S_h is his stock of skills and other human capital, and E_h is the environment. If t, S and E were exogenous, fitness could be changed only by changing the input of goods (in fact, access to food and perhaps other goods has been the main determinant of fitness). Then the production function can be written as

$$f = aX \tag{8}$$

Fitness has a "shador" price defined as the value of the goods used in changing fitness by one unit:

$$\pi = \frac{\partial(pX)}{\partial f} = \frac{p}{a} \tag{9}$$

where p is the price of X. Altruistic h is willing to transfer some of his goods to i because he is willing to reduce his own fitness in order to improve i's fitness. The budget constraint for h is

$$\begin{aligned} \frac{pf_h}{a_h} + \frac{pf_i}{a_i} &= I_h + I_i = S_h \\ \pi_h f_h + \pi_i f_i &= S_h \end{aligned} \tag{10}$$

The equilibrium condition is

$$\frac{\partial U^h/\partial f_h}{\partial U^h/\partial f_i} = \frac{\pi_h}{\pi_i} = \frac{a_i}{a_h} \tag{11}$$

If h and i were equally efficient producers of fitness, $a_h = a_i$.

- The same conclusion can be reached for altruism with regard to genetic fitness: although an altruist forgoes some onw fitness to raise the fitness of others, his own fitness may exceed that of an equally able egoist because the beneficiaries are discouraged from harming him.
- Statement that "altruism ... by definition reduces personal fitness" is not right. Altruism does not by definition necessarily reduce personal fitness.
- The sociobiological literatuer contends that a major conflict arises between parents and children because the altruism of parents toward children exceeds the altruism of children toward each other. Becker's analysis denies that such a conflict exists because children have an incentive to act as altruistically toward each other. This application of the more general result on the simulation of altruism by beneficiaries led to the name the "rotten kid theorem".