

Tough Love and Discounting: Empirical Evidence

Charles Yuji Horioka¹, Akiko Kamesaka², Kohei Kubota³,
Masao Ogaki⁴, & Fumio Ohtake⁵

Abstract

This paper presents empirical evidence concerning the tough love model of intergenerational altruism from U.S. and Japanese survey data. Our main finding is that parents' tendencies for tough love behavior depend on different measures of discount factors.

Key Words: Tough Love, Intergenerational Altruism, Discounting, Religion, Worldview, Survey Data

1 Introduction

This paper presents empirical evidence concerning Bhatt and Ogaki's (2008) tough love model of intergenerational altruism from unique U.S. and Japanese survey data collected by the Osaka University Center of Excellence (COE) project. How different generations are connected is an important economic issue with implications for individual economic behavior like savings, investment in human and physical capital and bequests which in turn affect aggregate savings and growth. It also has nontrivial policy implications as in Barro (1974), who has found that there will be no net wealth effect of a change in government debt in the standard altruism model. Infinite horizon dynamic macro models are typically based on the standard altruism model proposed by Barro (1974) and Becker (1974) in which the current generation derives utility from its own consumption and the utility level attainable by its descendant.

A striking implication of the standard altruism model is that when the child becomes impatient, transfers from the parent to the child do not change when the child is borrowing constrained as we will show in Section III. This implication of the model is not consistent with recent empirical evidence on

¹Osaka University

²Aoyama Gakuin University

³Osaka University

⁴Ohio State University

⁵Osaka University

pecuniary and non-pecuniary parental punishments (see Weinberg (2001), Hao, Hotz, and Jin (2008), and Bhatt (2008) for empirical evidence). For example, imagine that a child befriends a group of impatient children and suddenly becomes impatient because of their influence. As a result the child starts to spend more time playing with the new friends and less time studying. In worse cases, the child starts to smoke, drink, or consume illegal drugs (see Ida and Goto (2009) for empirical evidence that shows association of low discount factor and smoking). At least some parents are likely to respond by pecuniary punishments such as lowering allowances or non-pecuniary punishments such as grounding.

Bhatt and Ogaki modified the standard model to develop the tough love model of intergenerational altruism, so that it implies that the parent lowers transfers to the child when the child exogenously becomes impatient under a wide range of reasonable parameters. They modeled parental tough love by combining the two ideas that have been studied in the literature in various contexts. First, the child's discount factor is endogenously determined, so that low consumption at young age leads to a higher discount factor later in her life. This was based on the endogenous discount factor models of Uzawa (1968) except that the change in the discount factor is immediate in Uzawa's formulation whereas a spoiled child with high consumption progressively grows to become impatient in our formulation. Recent theoretical models that adopt the Uzawa-type formulation include Schmitt-Grohé and Uribe (2003) and Choi, Mark, and Sul (2008). Second, the parent evaluates the child's lifetime utility function with a constant discount factor that is higher than that of the child. Since the parent is the social planner in our simple model, this feature is related to recent models (see Caplin and Leahy (2004); Sleet and Yeltekin (2005), (2007); Phelan (2006), and Farhi and Werning (2007)) in which the discount factor of the social planner is higher than that of the agents.

We use the Osaka University COE survey data for Japan and the United States, which include two hypothetical questions concerning tough love behavior. We use answers to these questions as dependent variables in our regressions. The main question we ask is how parents' tendencies for tough love behavior depend on various measures of time discounting for parents' own lending and borrowing over different time horizons.

Tough Love Altruism

This section presents a tough love altruism model that provides for a channel

through which parents can influence the child's economic behavior. The model introduces the tough love motive of the parent via asymmetric time preferences between generations and endogenous discounting. This model predicts that the transfer to the child in period 1 will decrease when the child's discount factor exogenously decreases for a wide range of parameters.

Imagine a three-period model economy with two agents, the parent and the child. For simplicity we consider the case of a single parent and a single child. The three periods considered are childhood, work and retirement. The model has six features. First, the parent cares about his own consumption but is also altruistic toward the child. He assigns a weight of η to his own utility where $0 < \eta < 1$. The child on the other hand is a non-altruist and derives utility only from her own consumption stream $\{C_t\}_{t=1}^3$. Second, the life of the parent and the child overlap only in period 1. Third, transfers, T , are made only in period 1.⁶ Fourth, income of both the parent and the child is given exogenously. Fifth, the child is borrowing constrained in period 1. Lastly, there is no uncertainty in the economy. We will consider and compare four models in this economy.

In this model, the parent uses a constant and high discount factor to evaluate the child's lifetime utility while the child herself uses a discount factor which is endogenously determined as a decreasing function of her period 1 consumption:

$$\beta_{t,k}(C_1) \quad ; \quad \frac{\partial \beta_{t,k}}{\partial C_1} < 0.$$

With the borrowing constraint faced by the child in period 1, her discount factor is given by $\beta_{t,k}(y_1 + T)$.

The underlying motivation for this type of endogeneity of the child's discount factor is the belief that the parent can spoil the child by giving her very high consumption during childhood, so that the child will grow to be a relatively impatient person. This in turn is motivated by the empirical evidence and evidence in the child psychology literature discussed in Bhatt and Ogaki (2008).

⁶We assume that transfers are made from the parent to the child and there are no reverse transfers.

Now, the parent optimizes by solving the following optimization problem,

$$\max_T \left[\eta v(y_p - T) + (1 - \eta) \left[u(y_1 + T) + \beta_{2,p} u(C_2^*) \right. \right. \quad (1) \\ \left. \left. + \beta_{2,p} \beta_{3,p} u(R(y_2 - C_2^*)) \right] \right],$$

subject to

$$\{C_2^*\} \equiv \arg \max_{C_2} \left[u(C_2) + \beta_{3,k}(y_1 + T)u(R(y_2 - C_2)) \right]. \quad (2)$$

In this tough love model there is no closed form solution to the parent's problem for any functional form for the utility function. Bhatt and Ogaki reports simulation results, in response to an exogenous drop in the child's discount factor, the parent decreases the transfer to the child.

2 Empirical Evidence

The Osaka University COE surveys contain the following two questions concerning tough love behavior. We use answers to these two questions as dependent variables in our regression analysis.

39. Imagine that you have a 5-year old child that has a high fever and is in pain. The child's doctor tells you that both the fever and pain are harmless. He can give you a medicine that cures the sickness but slightly weakens the child's immune system when the child becomes 50 years old. What would you do? (X ONE Box)

1 I would give the medicine to the child if the sickness is known to last for one day.

2 I would give the medicine to the child if the sickness is known to last for two days.

3 I would give the medicine to the child if the sickness is known to last for one week.

4 I would give the medicine to the child if the sickness is known to last for one month.

5 I would not give the medicine to the child.

40. Imagine that you have a 19-year old child that has been working at a restaurant for the last month. The child has been doing so to earn money to buy a concert ticket. You agreed that it would be all right for the child to buy the ticket as long as the child earns the necessary money. The child just got fired, and asked you to help by providing one tenth of the necessary money. The tickets will be sold out if you do not provide the money. What would you do in this situation? (X ONE Box)

- 1 I would provide the money regardless of the reason why the child got fired.
- 2 I would provide the money if the child is not at fault for being fired.
- 3 I would not provide the money because it is not good for my child.
- 4 I would not provide the money because it will be a waste of money.

References

- [1] Barro, Robert, J. 1974. “Are Government Bonds New Wealth”? *Journal of Political Economy* 82 : 1095–1117.
- [2] Bhatt, Vipul. 2008. “ Intergenerational transfers and substance use by children : Empirical evidence using Micro data”. Unpublished.
- [3] Bhatt, Vipul, and Masao Ogaki. 2008. ‘Tough Love and Intergenerational Altruism.’ University of Rochester, Rochester Center for Economic Research Working Paper No. 544.
- [4] Caplin, Andrew, and John Leahy. 2004. “The Social Discount Rate”. *Journal of Political Economy* 112 : 1257-1268.
- [5] Choi, Horag, Nelson C. Mark and Donggyu Sul. 2008. “Endogenous Discounting, the World Saving Glut and the U.S. Current Account.” *Journal of International Economics* 75: 30-53.
- [6] Farhi, Emmanuel and Ivan Werning. 2007. “Inequality and Social Discounting”. *Journal of Political Economy* 115 (June) : 365-402.
- [7] Hao Lingxin, Hotz V. Joseph and Jin Ginger Z. 2008. “Games Parents and Adolescents Play: Risky Behavior, Parental Reputation and Strategic Transfers”. *Economic Journal* 118 : 515-555.

- [8] Ida, Takamori and Rei Goto. 2009. "Simultaneous Measurement of Time and Risk Preferences: Stated Discrete Choice Modeling Analysis Depending on Smoking Behavior." *International Economic Review* 50 : 4, forthcoming.
- [9] Phelan, Christopher. 2006. "Opportunity and Social Mobility". *Review of Economic Studies* 73 : 487-504.
- [10] Schmitt-Grohé, Stephanie and Martin Uribe. 2003. "Closing Small Open Economy Models." *Journal of International Economics* 44: 257-287.
- [11] Sleet, Christopher, and Sevin Yeltekin. 2005. "Social Credibility, Social Patience, and Long-Run Inequality". Manuscript. Carnegie Mellon University.
- [12] Sleet, Christopher, and Sevin Yeltekin. 2007. "Credibility and Endogenous Societal Discounting". *Review of Economic Dynamics*.
- [13] Uzawa, H. 1968. "Time Preference, the Consumption Function, and Optimum Asset Holdings". In J. N. Wolfe ed. , *Value, Capital, and Growth: Papers in Honour of Sir John Hicks* Edingburgh, Scotland: University of Edingburgh Press.
- [14] Weinberg, A. Bruce. 2001. "An Incentive Model of the Effect of Parental Income on Children". *Journal of Political Economy* 109 : 266-280.