Cultures, Worldviews, and Intergenerational Altruism

Kohei Kubota[1], Charles Yuji Horioka[2], Akiko Kamesaka[3], Masao Ogaki[4], & Fumio Ohtake[5]

May 30 2011

Abstract

This paper presents empirical evidence concerning effects of cultural differences on parents' attitudes toward children from unique U.S. and Japanese survey data. These data sets have been collected by Osaka University, and contain questions concerning worldviews and religions, hypothetical questions about parental behavior, and questions about socioeconomic variables. The data show that U.S. parents tend to be tougher than Japanese parents toward young children. Our evidence suggests that contents of worldview beliefs held by parents affect parents' attitudes toward children. Our empirical evidence also indicates that people who are confident about issues related to worldviews tend to show tough attitudes toward their children. Because U.S. parents are much more confident than Japanese parents in worldview issues on the average, this cultural difference helps explain a substantial portion of the difference in parental attitudes between U.S. and Japanese parents.

Key Words: Culture, Worldview, Intergenerational Altruism, Tough Love, Religion

1 Introduction

This paper presents empirical evidence concerning effects of cultural differences on parents' attitudes toward children from unique U.S. and Japanese survey data. These data were collected by the Osaka University 21st Century Center of Excellence (COE) program. These data contain questions concerning worldviews and religions and hypothetical questions about parental behavior as well as socioeconomic variables.

[1]Nihon University
[2]Osaka University
[3]Aoyama Gakuin University
[4]Keio University
[5]Osaka University

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. In recent work in this literature such as Akabayashi (2006) and Bhatt and Ogaki (2008), Barro-Becker's standard altruism model is modified to analyze parents' discipline behavior.

In a companion paper, Kubota, Horioka, Kamesaka, Ogaki, and Ohtake (2010), we sought to examine whether or not parents' discount factors affect their attitude toward their children as predicted by these models. In that paper, we used the Osaka University Global COE survey data for Japan and the United States, which continued the survey data we use in the present paper. The main question we asked in the companion paper was how parents' tendencies for tough love behavior depend on various measures of time discounting for parents' own lending and borrowing over different time horizons. We found evidence that is consistent with the tough love model. We also found that parents with debt aversion tend to show tough love. One empirical puzzle we found was that proportionately more U.S. parents show tough love to young children before the school age than Japanese parents even after controlling for time discounting, debt aversion, and other economic and demographic factors. However, in the companion paper, we did not seek cultural differences between the two countries as possible factors that affect parents' attitudes. We examine effects of cultural differences on parents' attitudes in this paper.

For the purpose of considering cultural differences, we use the concept of worldviews. Here we use the word "worldview" as the explicit and implicit beliefs, norms, logic, and emotions that underlie a culture. The word "worldview" was first used by a book published by Kant in 1790 (Kant, 1987) according to Naugle (2002). Since then the word has been used by many philosophers such as Hagel (1961, first published in 1807), Kierkegaard (1966), and Heidegger (1982). These philosophers tended to use the word for the cognitive aspect of how a person views the world. In Anthropology, the word has been used in a broader way to encompass the cognitive, normative,

and emotional aspects as reviewed by Hiebert (2008). Hiebert models a culture in three layers. Inspired by Hiebet's model, we model the surface of a culture as the sensory level that includes cultural behavior such as rituals and economic behavior. The next level is explicit belief systems that can include religious belief systems. The deepest level is implicit and contains different ways that people categorize and carry out logic. In the current world with globalization, each person is exposed to different cultures and their underlying worldviews. So each person is thought to attach subjective probabilities to different worldviews.

One possible factor that may help explain the puzzle mentioned above is differences in worldviews in the two countries. There are many ways in which worldviews affect parents' attitudes and behavior. When a parent feels that it is better in the long run to discipline a child, he is often tempted not to do that because he does not want to see her suffer now. Worldviews can affect his discipline behavior by changing the long run benefit or the short run cost.

One way is through the confidence of parents in a worldview and beliefs and values associated with it. If a parent is very confident in a worldview, then the parent is more likely to discipline the child when the child deviates from the values that the worldview promotes. On the other hand, if a parent is not confident about values, it must be difficult for the parent to let his child suffer through a discipline that promotes personal development that such values promote. Thus the confidence in worldviews affects the long run benefit of discipline behavior. As we will see, our data show that people in the United Sates are much more confident than people in Japan. Hence this difference can help explain the puzzle.

Another way is related to how suffering is viewed in different worldviews. Some people think that suffering has a positive meaning such as promoting personal development. We call this the positive view of suffering. Other people think that suffering has a negative meaning such as a consequence of past bad behavior. We call this the negative view of suffering. The neutral view of suffering holds that suffering is meaninglessly random. Comparing with the neutral and negative views of suffering, the positive view encourages parents to do discipline behavior by decreasing the short run cost. So, other things being equal, a person with the positive view of suffering should find it easier to fight against the temptation not to discipline than a person with the neutral or negative view.

The worldview of suffering is related to religions. The positive view is often held by Christians who believe that all knowing, almighty God allowed

His only Son to suffer on the cross for the purpose of saving the world. Christians often conclude that their own suffering and other people's suffering were allowed by God for a purpose such as personal development. The negative view is often held by Buddhists who believe in the doctrine of reincarnation. Without the doctrine of reincarnation, it is difficult to hold the negative view of suffering when babies and young children suffer from illnesses and accidents. It is hard to believe that they have done sinful behavior to deserve the suffering during their short lives. However, with the doctrine of reincarnation, it is easy to explain that their illnesses and accidents are consequences of their behavior in previous lives. Buddhism has the doctrine of reincarnation and typically emphasizes deliverance from suffering, and so tends to promote the negative view of suffering. There are many Buddhists in Japan while there are many Christians in the United States. Hence this difference can help explain the puzzle.

However, it is often observed that people who belong to the same religion holds very different worldviews and that people who belong to different religions have some similar worldview beliefs. Hence worldview differences may be more important than religious differences in determine parental attitudes. It should be noted that one's worldview about suffering is related to how randomness is viewed at least unconsciously. In the probability theory of time series of random variables, a whole history can be viewed as determined by a point in the probability space. If the point was chosen meaninglessly by the nature as in the Naturalistic worldview, then accidents, illnesses, natural disasters occur meaninglessly randomly. Hence the neutral view of suffering is appropriate. If the point was chosen with a meaning, for example by God as in the theistic worldview, then the positive or negative views of suffering are more appropriate. If one believes that God exists, then he is more likely to take the positive or negative views of suffering. If one believes in the evolution theory, he is more likely to take the neutral view of suffering. There are differences in these worldview beliefs between the United States and Japan, and they can help explain the puzzle.

The rest of this paper is organized as follows. Section 2 gives a literature review. Section 3 explains the tough love model. Section 4 contains concluding remarks.

2 Related Literature

This paper is part of the literature on effects of culture (including religion) on economic outcomes. There are differences in economic outcomes such as saving rates and growth rates across countries and individuals. Recently, many economists are studying culture as a possible determinant of these differences. Guiso, Sapienza, and Zingales (2006) gives an insightful survey of this literature. Until recently, economists have been reluctant to use culture to explain economic phenomena. This is mainly because the notion of culture is broad and vague. As a result, it is difficult to formulate refutable hypotheses about culture. For this reason, it is important to carefully define culture. Guiso, Sapienza, and Zingales (2006) defines culture as "those customary beliefs and values that ethic, religious, and social groups transmit fairly unchanged from generation to generation." This definition is intentionally narrow in order to overcome this difficulty. Since their definition involve beliefs and values that are important components in worldviews, it is closely related to the definition of culture as three layers of behavior, belief systems, and the core worldview.

Another element is the development of behavioral economics. In traditional economics, the methodology to exclusively focus on outcomes of behavior without paying attention to psychological and emotional process in decision makings became prevalent in the years after World War II. Because of this methodology, economists have been reluctant to use data collected by questions using hypothetical situations and questions about subjective feelings. However, these types of questions have been used in other social science disciplines such as psychology and sociology. Behavioral economics, which incorporates methodologies form other disciplines, has developed and successfully used data involving these types of data. Using these types of data has been important in the literature in economics on culture.

For example, Guiso, Sapienza, and Zingales (2003) use questions with the subjective nature in the World Value survey to measure attitudes that are considered to affect economic performance. One such attitude is the parental attitude to teach children about thriftiness. They show that people who were raised religiously are more likely to have this attitude. Guiso, Sapienza, and Zingales (2006) show that countries which have the stronger attitude to teach thriftiness to children have higher national savings.

This paper is also related to the literature of cultural preference formation that started by Bisin and Verdier (2001). In the theoretical models of

this literature, preferences are endogenous, and parents affect formation of children's formation. In some models (e.g. Doepke and Zilibotti 2008), parents are purely altruistic in their decisions to affect children's preferences. In other models (e.g., Bisin and Verdier 2001, Akabayashi 2006, and Bhatt and Ogaki 2008), parents are also paternalistic in the sense that they try to affect children's preferences in the way that the parents prefer. These models can be consistent with recent empirical evidence on pecuniary and non-pecuniary parental punishments (see Weinberg (2001), Hao, Hotz, and Jin (2008), and Bhatt (2008) for empirical evidence). In contrast, the standard intergenerational altruism model by Barro (1974) and Becker (1974) do not predict parents' discipline behavior in situations in which we expect parents in our real lives to discipline their children. For example, 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 Bhatt and Ogaki (2008,section III) showed.

Bhatt and Ogaki (2008) 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, e.g., Caplin and Leahy (2004); Sleet and Yeltekin (2007); Phelan (2006), and Farhi and Werning (2007)) in which the discount factor of the social planner is higher than that of the agents. This model provides a basic guidance for our empirical work to look at parental attitudes to discipline children with time discounting even though it does not cover all aspects of our empirical work.

3 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 introduce 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. We use this model to interpret our empirical results. This model is used to motivate our empirical work and gives a framework to interpret some aspects of our empirical results.

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 $\beta_{t,k}(y1 + T)$.

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

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

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).

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

$$\max_{T} \Bigg[\eta\, v(y_p - T) + (1-\eta)\Big[u(y_1 + T) + \beta_{2,p} u(C_2^*) + \beta_{2,p}\beta_{3,p} u(R(y_2 - C_2^*))\Big]\Bigg], \tag{1}$$

subject to

$$\{C_2^*\} \equiv \arg\max_{C_2} \Big[u(C_2) + \beta_{3,k}(y1 + T)u(R(y_2 - C_2))\Big]. \tag{2}$$

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. When the discount factor that is used by the parent to evaluate the child's life time utility is higher than the discount factor of the child for the second and third periods, the parent decreases the transfer to the child in response to an exogenous drop in the child's discount factor, the parent decreases the transfer to the child for a wide range of parameter values. The intuition is that the parent prefers the child's consumption to grow at a faster rate (or drop at a slower rate) in this situation. This gives the parent a tough love incentive to decrease the transfer, so that the child will grow to be more patient. This incentive intensifies when the child's discount factor exogenously drops.

4 Data

The analyses in this paper are based on data from two questionnaire surveys: (1)Osaka University 21st Century Center of Excellence Program entitled "Preference and Life Satisfaction Survey" conducted in Japan(PLiSS-JAP); and the same survey conducted in the US (PLiSS-US).

A brief description of each survey follows. PLiSS-US and PLiSS-JAP is a panel study, which started in February 2004 as part of the Osaka University 21st Century Center of Excellence Program. PLiSS-JAP has been conducted annually since 2004 using a random sample drawn from 6,000 individuals by a placement@(self-administered) method. A new sample of 2,000 people which were traced was added to the 2006 survey. The 2008 survey also added a new sample of 3,000 people by mailing method. This research will use only the 2008 survey data because the cross-sectional sample size is the largest since 2004 in the PLiSS-JAP that contain worldview questions. The number of respondents was 3,975.

In order to evaluate the tough love attitudes of parents, we use the following two questions. We call these "Fever" and Concert" questions, respectively.

The Fever Question: 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.

The Concert Question: 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)

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.

We report the distributions of answers to the "Fever" question in Figure 1. For the "Fever" question, we interpret Answers 1-4 as parents' behaviors motivated by spoiling love with tougher love indicated by a higher numbered answer and Answer 5 as parents' behaviors motivated by tough love. With these interpretations, we conclude that 53% of American parents show tough love, while only 30% of Japanese parents show tough love to a 5-year old child. This result is not surprising given casual observations relatively little discipline children receive in Japan in their pre-school ages compared with children in the United States: it is relatively more often in Japan than in the United States to find pre-school children running around in stores while their parents do not do anything, for example.

In the companion paper, Kubota et al. (2011), we reported that there is not striking difference between U.S. and Japanese respondents for the "Concert" question. Because we are interested in the cultural differences in the present paper, we focus on the "Fever" question. However, we cannot distinguish between selfish parents who just do not want to use their time or money to give the medicine from tough love parents who truly are concerned about the long-run happiness of their children if we only use the "Fever" question. For this reason, we use the "Concert" question to classify some respondents as selfish. Given that the parent's behavior is the same for Answer 3 and Answer 4, the only difference is the motivation. Answer 3 indicates that the motivation is for the good of the child, while Answer 4 indicates that the motivation is about the money. After removing the respondents who are classified as selfish by the "Concert" question, we classify the remaining respondents as "tough love" or "spoiling love" according to the "Fever"' question. The results are in Figure 2. The fraction of people who chose Answer 4 is 5.7% in the United States, while the fraction is 1.3% in Japan. The international difference in the fraction of the respondents who are classified as "tough love" is 23% in Figure 1, and the difference is 20% in Figure 2. Thus we have smaller international difference in Figure 2, but the difference is still striking.

We think that most parents are tempted to give the medicine in the situation of the question even if they think that it is better not to give the medicine. A parent needs to have a strong conviction about his decision not

to give the medicine if he is to fight against the temptation for one month. So we think that a type of a person who tends to have strong conviction is more likely to choose Answer 5. We constructed variables called "Confidence about spiritual questions" and "Confidence about non-spiritual questions" to measure degrees of confidence for spiritual and non-spiritual dimensions. In order to construct these variables, we give points to answers to certain questions. For the "Confidence about spiritual questions" variable, we gave one point to either Answer 1 "You totally disagree to it." or Answer 5 "You totally agree to it." for each of the following statements: "Life after death exists," "God or gods exist," "God knows about all wrong we've done," "Spirits and Ghosts exist," "Heaven exists."

For the "Confidence about non-spiritual questions" variable, we gave one point to either Answer 1 or Answer 5 for each of the following statements: "I will never be robbed," "I always keep my promise," "I know a lot about politics," "What is written in science text books is true," "I have a good memory," and "Human beings evolved from other living things." We then construct another variable called "Confidence" by adding these two variables.

We report the distributions of these three variables in the United States and Japan in Figure 3,4, and 5, and their descriptive statistics in Table 1. Figure 3 is for the "Confidence" variable, Figure 4 is for the "Confidence about spiritual questions" variable, and Figure 5 is for the "Confidence for non-spiritual questions" variable. Figure 3 shows that the fraction of the U.S. people who scores 0 point for the "Confidence" variable is about 8%, the fraction of the people peaks for 6 points at the level of about 14%, and then the fraction gradually declines with the fraction of 1% people scoring the full 11 points. The fraction of the Japanese people who scores 0 point for this variable is about 32%, and it gradually declines to about 1% for 9 points. No one in Japan scored 10 or 11 points. This variable shows a sharp cultural difference in the two countries. The distributions of the "Confidence for spiritual questions" and the "Confidence for non-spiritual questions" variable show similar cultural differences except that the U.S. distribution of the "Confidence for spiritual questions" variable is bimodal with two peaks at 0 point and 4 points.

Table 1 reports descriptive statistics of answers for questions related to worldviews and religions. Appendix 1 lists these questions that were common to both countries.[7] Appendix 2 explains religious affiliation questions

[7]For the purpose of clearer presentation, we reversed the ordering of the answers. In

used in each of these two countries. Because there are many more Protestant Christians in the United States than in Japan, the U.S. survey asked more detailed denomination affiliation questions within the category while the Japanese survey combined all Protestant denominations in one category. Scientology was an option to the question only in the U.S. survey because there has virtually been no one affiliated with Scientology in Japan. In our analysis, for each of these variables, we constructed the "Yes" dummy by assigning the value of 1 to Answers 4 and 5 and zero otherwise. We also constructed the "No" dummy by assigning the value of 1 to Answers 1 and 2 and zero otherwise. We report descriptive statistics only for selected worldview beliefs in order to save space. The section criterion is explained later when we explain results for Table 4.

If we assume that parents with higher discount factors for their own financial decisions use their higher discount factors to evaluate their children's life time utilities, then the tough love model predicts tougher parental behaviors toward their children for parents with higher discount factors for their own financial decisions. To test this hypothesis, we need data for parents' patience. PLiSS-US and PLiSS-JAP contains the questions about patience of respondents. We use the hypothetical questions to ask the attitude of intertemporal choices of receiving cash. There are 5 different questions in this type. These questions are for different settings about the timing of receiving (or paying) cash and the amount of receiving (or paying) cash and are in Appendix 3.

We call the first of these five questions the "Impatience(1)" question. The question starts with "Let's assume you have two options to receive some money. You may choose Option "A", to receive $100 in two days; or Option "B", to receive a different amount in nine days. Compare the amounts and timing in Option "A" with Option "B" and indicate which amount you would prefer to receive for all 8 choices." Then it lists a table of 8 choices for the two options and the corresponding interest rate for each choice (see Appendix 1 for more complete descriptions of these five questions.) Option B ranges from $99.81 to $105.74. These eight options correspond with the annual interest rates of -10%, 0%, 10%, 20%, 50%, 100%, 200%, and 300%, respectively. The "Impatience(2)" question starts with "Now let's assume that you have the option to receive $100 in ninety days or receive a different amount in

the original questions, Answer 1 was "You totally agree to it" or "It is particularly true for you."'

ninety-seven days." For this question, the eight choices of Option B and the corresponding interest rates are the same at the "Impatience(1)" question. The "Impatience(3)" question starts with "Now let's assume that you have the option to receive $100 in one month or receive a different amount in thirteen months." For this question, Option B ranges from $95 to $140. These eight choices correspond with the annual interest rates of -5%, 0%, 2%, 4%, 6%, 10%, 20%, and 40%. The "Impatience(4)" question starts with "Now let's assume that you have the option to receive $10,000 in one month or receive a different amount in thirteen months." For this question, Option B ranges from $9,500 to $11,000. These eight choices correspond with the annual interest rates of -5%, 0%, 0.1%, 0.5%, 1%, 2%,6%, and 10%. The "Impatience(5)" question starts with "Now let's assume that you have the option to receive $10,000 in one month or pay a different amount in thirteen months." For this question, Option B ranges from $9,500 to $11,000. These eight choices correspond with the annual interest rates of -5%, 0%, 0.1%, 0.5%, 1%, 2%,6%, and 10%.

Thus the "Impatience(1)" question is about discounting between two days later and nine days later. The "Impatience(2)" question is about discounting between ninety days later and ninety-seven days later. The "Impatience(3)" question is about discounting between one month later and thirteen months later for $100. The "Impatience(4)" question is about discounting between the same time points in time, but for $10,000. The "Impatience(5)" question is about discounting between the same time points in time for $10,000 as the "impatience(4)" question, but is for paying rather than receiving.

From these five questions, we constructed five patience proxies, which are calculated from the expected values of the range of designated in the questions. The calculation procedure is described in Appendix 4. For our regression analyses, we used a standardized mean of the first four patience proxies called "Impatience(1)", "Impatience(2)", "Impatience(3)", and "Impatience(4)" as our measure of patience. We took the mean to mitigate the measurement error problem. We used the difference between "Impatience(5)" and "Impatience(4)" as a measure of debt aversion. The descriptive statistics of these patience proxies are summarized in Table 1.

Table 1 also reports descriptive statistics for the socioeconomic variables, which are respondent's sex, age, race (only in the U.S. survey), education years, having children dummy, log of household's income, and log of household's financial asset. The questions about income and asset are in Appendix 3.

5 Empirical Results

We estimate the probit model because the dependent variables from the "Fever" question are discrete choice variables. The independent variables are religious and worldview variables, "Confidence" variables, patience proxy variables, and socioeconomic variables. The results are presented in Tables 2-4 that report the marginal effects.

Table 2 reports the results from the "Fever" question. Regressions (1) and (2) are when we construct the dependent variable by setting it to be 1 if Answer 5 is chosen and 0 otherwise for the "Fever" question. Here we are using our interpretation that Answer 5 indicates the tough love attitude as discussed in the last section. In all regressions, we include the impatience and the debt aversion measures that were found to have statistically significant effects in the companion paper as well as socio economic variables such as the male dummy, age, education years, having children dummy, and log of per capita household income. Also included in all regressions are the product of the dummy variable for being deeply religious and the dummy variables for affiliations of religions. In addition to these variables, we added "Confidence," variables.

First, we focus our discussion on the marginal effects of the "Confidence" variable in Regressions (1). In this regression, the sign of the coefficient for the "Confidence" variable is positive, and the coefficient is statistically significant at the 1% level. If the parent is of the confident type, he tends to show the tough love attitude. Even if a parent judges that being tough on the child is good for the child in the long run, it is tempting to be soft in the short run. A parent who is confident in his judgment can more easily regist this temptation. This confidence, however, may turn out to be overconfidence in some cases as we discussed above. So being tough because the parent is of the confidnet type may or may not be good for the child in the long run. Our focus in this paper is the effect of the type on the disciplin behavior rather than on judging whether or not being tough is good for the child. When we remove the "Confidence" varialbe and add the "Confidence in spiritual questions" and "Confidence in non-spiritual quesitons" variables in Regression (2), the effect of the "Confidence in non-spiritual quesitons" variable is more important in terms of both the statitical significnce level and the magnitude of the point estimate.

Second, we focus on the marginal effect of the religious variables. The sign of the coefficient for the product of "Buddhism" affiliation dummy variable

and the "deeply religious" dummy is positive, and the coefficient is statistically significant at the 5% level. Thus, people who belong to Buddhism and are deeply religious are less liekely to have a tough love attitude. This is consistent with our discussion in the Introcution that it is more difficult for a parent to regist the temptation to remove suffering in the short-run in the Buddhism worldview.

Regressions (3) and (4) in Table 2 are when we we construct the dependent variable by setting it to be 1 if Answer 1 is chosen and 0 otherwise for the "Fever" question. Here we are using our interpretation that Answer 1 indicates an extremely spoiling love attitude as discussed in the last section.

First, we focus our discussion on the marginal effects of the "Confidence" variable in Regression (3). In this regression, the sign of the coefficient for the "Confidence" variable is positive, and the coefficient is statistically significant at least at the 1% level. When we remove the "Confidence" varialbe and add the "Confidence in spiritual questions" and "Confidence in non-spiritual quesitons" variables, only the "Confidence in spiritual quesitons" variable remains significant. This is in contrast with the results for Regressions (2) that the effect of the "Confidence in non-spiritual quesitons" variable was more significant. We think that this result may reflect some people who are spiritual and are confident in spiritual questions. Such people may give the medicine and just pray that the child's immune system be protected.

Second, we focus on the marginal effect of the religious variables. The sign of the coefficient for the product of "Christianity" affiliation dummy variable and the "deeply religious" dummy is negative, and the coefficient is statistically significant at the 5% level in many regressions. Thus, people who belong to Christianity and are deeply religious are less liekely to show an extremely spoiling love attitude.

Table 3 reports results for the separate contributions of international differences in various characteristics such as "Confidence" and "Impatience" to the difference in the parental attitudes. The non-linear Blinder-Oaxaca decomposition was conducted by the method for the probit model in Fairlie (2005). The results for Regression (1) for the tough love attitude in Table 2 are reported in column (1). The contribution of the "Confidence" variable is statistically significant at the 1% level. The contribution is 27% of the total explained by the international differences in the explanatory variables. This contribution is by far the largest among the explanatory varialbes. The contribution of the "Buddhism" varialbe is also siginficant at the 1% level. However, the magnitude of the contirbution is very small compared with

the "Confidence" varialble. The mganitude of the marginal effect of the Buddhism varialbe is estimated to be large as in Talbe 2, but the contribution of the variable is small because there are few Buddhists who are deeply religious even in Japan. The contribution of the "Confidnece" variable is large and statistically significant for the choice of Answer 1 as reported in column (2) of the table.

Table 4 reports the Probit regression results when we include both the confidence variable and "Yes" and "No" dummy variables for worldview beliefs as independent variables. We only report the results for a particular worldview belief when at least one effect of the "Yes"' or "No" dummy variables is significant at the 5% level for either "tough love" or "extremely spoiling love." The effect of the confidence variable remains to be significant at the 1 percent level when a set of "Yes" and "No" dummy variables is included for various worldview beliefs.

Panel A of Table 4 reports results when the dependent variable is the "tough love" dummy variable. The effect of "No" dummy variable for "I always keep my promise" is positive and significant for tough love. Given that no human being has an ability to always keep one's promise, we interpret this result to mean that respondents who do not have the tendency for overconfidence after controlling for the level of confidence are more likely to show tough love. The effect of "No" dummy variable for "Human beings evolved from other living things" is positive and significant at the 5% level. Our interpretation of this result is based on differences in the worldviews of suffereing. Other things being equla, the evolution theory seems to tend to encourage people to think that the origin of human beings is meaninglessly random. So people who reject the evolution theory are more likely to have the positive view of suffering.

Panel B of Table 4 reports results when the dependent variable is the "extremely spoiling love" dummy variable. Both the effect of "No" dummy variable for "God or gods exit" and the effect of "Yes"' dummy variable for "What is written in science textbooks is true" are negative and statistically significant at the 5% level. For each regression, the

Table 5 is for the non-linear Blinder-Oaxaca decomposition for the regression models in Table 4. Panel A reports results when the dependent variable is the "tough love" dummy variable. The contribution of the "confidence" variable is significant at the 1% level, and its size as measured by the fraction of the toal explained is stable between 21% and 26%. The contribution of "No" dummy variable for "I always keep my promise" is significant at the 1%

level, and its size is even larger than the "confidence" variable. We also note that adding the "Yes" and "No" dummy varaibles to the regression increases the total explained from 51% in Talbe 3 to 73%. The contribution of "No" dummy variable for "Humand beings evolved from other living things" is significant at the 1% level, and its size is about 40% of that of the "confidence" varialbe. Comparing with the size of the contribution of the Buddhism variable in Table 3, the effect of the worldview belief about the evolution theory is much more important. Panel B reports results when the dependent variable is the "extremely spoiling love" dummy variable. No worldveiw belief variable is significant at the 5% level, and the point estimates of the size of the contribution are small.

Table 6 reports the results when we combine the "Fever" with the classification of selfish respondents from the "Concert" question as explained in the last section. With the three possible values for the dependent variable, we ran a multinomial probit regression. With this modification, the results for tough love are similar to those of Table 2. The effect of the confidence variable is significant at the 1% level in each of the regressions.

6 Concluding Remarks

Because the "Confidence" variables we constructed exhibit striking differences between Japan and the United States, these variables seem to succeed in quantifying a large cultural difference in Japan and the United States for the dimension of confidence in beliefs. Our empirical evidence indicates that these variables have explanation power for individual and cross-country differences in parents' attitudes toward children, an important economic behavior. Our evidence also suggests that worldviews and religions affect tough love and spoiling love attitudes. The magnitude of the contribution of the "Confidence" variable to the difference in parental attitudes is larger than the contribution of other variables including the dummy variable for being deeply religious in Buddhism.

It should be noted that cultural differences are differences in distributions of characteristics in two cultures, while individuals who belong to a culture may not show the characteristic of the culture. U.S. people tend to be much more confident in worldview beliefs than Japanese people as shown by the mode of 6 in U.S. and the mode of 0 in Japan for the "Confidence" variable. However, some U.S. individuals score 0 for the "Confidence" variable, and

some Japanese individuals score 6 or more for the variable. In each culture, an individual who is more confident is more likely to show tough love.

Effects of some of the religious variables were statistically significant with sizable marginal effects in probit regressions. However, in terms of the contribution to explain international differences in parental attitudes, the "Confidence" variable and some worldview belief variables were much more important than the religious variables.

References

[1] Akabayashi, Hideo. 2006. "An Equilibrium Model of Child Maltreatment". *Journal of Economic Dynamics and Control* 30 (June): 993–1025.

[2] Barro, Robert, J. 1974. "Are Government Bonds New Wealth"?*Journal of Political Economy* 82 : 1095–1117.

[3] Becker, Gary, "A Theory of Social Interactions," *Journal of Political Economy* 82 (1974), 1063–1093.

[4] Bhatt, Vipul, "Adolescent Substance Use and Intergenerational Transfers: Evidence from Micro Data," *forthcoming in Journal of Family and Economic Issues*, (2011).

[5] Bhatt, Vipul, and Masao Ogaki. 2008. 'Tough Love and Intergenerational Altruism." University of Rochester, Rochester Center for Economic Research Working Paper No. 544.

[6] Bisin, A., and T. Verdier, "The Economics of Cultural Transmission and the Dynamics of Preferences,"*Journal of Economic Theory* 97 (2001), 298-319.

[7] Caplin, Andrew, and John Leahy. 2001. "Psychological Expected Utility Theory and Anticipatory Feelings," *Quarterly Journal of Economics* 116, 55-79.

[8] 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.

[9] Doepke, M and Zilibotti, F. 2008 "Occupational Choice and the Spirit of Capitalism," *Quarterly Journal of Economics* 123, 747-793.

[10] Fairlie, R. W. 2005 "An Extension of the Blinder-Ozxaca Decomposition Technique to Logit and Probit Models," *Journal of Economic and Social Measurement* 30, 305-316.

[11] Guiso, L., P. Sapienza, and L. Zingales. 2003. "People's Opium? Religion and Economic Attitudes." *Journal of Monetary Economics* 50, 225-282.

[12] Guiso, L., P. Sapienza, and L. Zingales. 2006. "Does Culture Affect Economic Outcomes?" *Journal of Economic Perspectives* 20, 23-48.

[13] Hagel, G.W.E. (1961). The Phenomenology of Mind. Translated with introduction and notes by J.B. Baillie. 2nd ed. London: George Allen and Unwin.

[14] 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.

[15] Heidegger, M. 1982. The Basic Problems of Phenomenology. Translation, introcution, and lexicon by A. Hofstadter. Studies in Phenomenology and Existential Philosophy. Bloomington: Indiana University Press.

[16] Hiebert, Paul G. 2008. *Transforming Worldviews: An Antholopological Understanding of How People Change.* Grand Rapids, Michigan: Baker Publishing Group.

[17] Ida, Takanori 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.

[18] Kant, I. (1987). Critique of Judgment: Including the First Introduction. Translated and Introduction by W. S. Pluhar. Foreword by M. J. Gregor. Indianapolis: Hackett.

[19] Kierkegaard, S. (1966). On Authority and Revelation. Translated with an introduction and notes by W. Lowrie. Introduction by F. Sontag. New York: Harper and Row, Harper Torchbooks.

[20] Kubota, Kohei, Charles Y. Horioka, Akiko Kamesaka, Masao Ogaki, and Fumio Ohtake. 2010. "Time Discounting and Intergenerational Altruism." Manuscript.

[21] Nakagawa, Masao. 2010. "Patience for Savouring." manuscript, The Institute of Social and Economic Research, Osaka University.

[22] Phelan, Christopher. 2006. "Opportunity and Social Mobility". *Review of Economic Studies* 73 : 487-504.

[23] Schmitt-Grohé, Stephanie and Martin Uribe. 2003. "Closing Small Open Economy Models." *Journal of International Economics* 44: 257-287.

[24] Sleet, Christopher, and Sevin Yeltekin. 2007. "Credibility and Endogenous Societal Discounting". *Review of Economic Dynamics.*

[25] Uzawa, H. 1968. "Time Preference, the Conusmption Function, and Optimum Asset Holdings". In J. N. Wolfe ed. , *Value, Captital, and Growth: Papers in Honour of Sir John Hicks* Edingburgh, Scotland: University of Edingburg Press.

[26] Weinberg, A. Bruce. 2001. "An Incentive Model of the Effect of Parental Income on Children." *Journal of Political Economy* 109 : 266-280.

Table 1. Descriptive Statistics

	United States			Japan		
	Obs.	Mean	S.D.	Obs.	Mean	S.D.
Worldview						
God or gods exist						
Yes dummy	1470	0.79	0.41	2477	0.40	0.49
No dummy	1470	0.07	0.26	2477	0.21	0.41
I always keep my promise						
Yes dummy	1468	0.21	0.41	2479	0.84	0.37
No dummy	1468	0.52	0.50	2479	0.02	0.15
What is written in science text books is true						
Yes dummy	1487	0.28	0.45	2477	0.47	0.50
No dummy	1487	0.30	0.46	2477	0.06	0.24
Human beings evolved from other living things						
Yes dummy	1460	0.39	0.49	2472	0.57	0.49
No dummy	1460	0.39	0.49	2472	0.10	0.30
Confidence						
Confidence	1356	4.54	2.68	2444	1.95	2.18
Confidence about spiritual questions	1435	2.79	1.85	2468	1.04	1.63
Life after death exists	1488	3.89	1.22	2478	2.94	1.12
God or gods exist	1470	4.31	1.09	2477	3.20	1.08
God knows about all the wrong we've done	1472	4.08	1.25	2474	3.13	1.11
Spirits and Ghost exist	1486	3.07	1.35	2479	2.92	1.15
Heaven exists	1484	4.16	1.12	2478	3.02	1.02
Confidence about non-spiritual questions	1399	1.75	1.38	2452	0.92	1.01
I will never be robbed	1472	2.59	1.06	2480	3.04	0.90
I always keep my promise	1468	2.56	1.15	2479	4.03	0.69
I know a lot about politics	1475	2.58	1.20	2479	2.43	0.95
I have a good memory	1487	2.94	1.03	2477	3.45	0.73
What is written in science text books is ture	1488	2.58	1.17	2473	2.99	0.97
Human beings evolved from other living things	1460	2.90	1.54	2472	3.63	0.98
Religions						
Christan × Deeply religious dummy	1492	0.32	0.47	2482	0.01	0.09
Protestant × Deeply religious dummy	1492	0.15	0.36			
Catholic × Deeply religious dummy	1492	0.12	0.32			
Other Christan × Deeply religious dummy	1492	0.05	0.21			
Buddhism × Deeply religious dummy				2482	0.04	0.20
Otherwise × Deeply religious dummy	1492	0.03	0.17	2482	0.02	0.13

Table 1. Descriptive Statistics (continued)

	United States			Japan		
	Obs.	Mean	S.D.	Obs.	Mean	S.D.
Preference and socioeconomic variables						
Impatience	1492	0.07	0.84	2482	0.06	0.88
Debt aversion	1492	0.04	0.08	2482	0.03	0.04
Respondent is male dummy	1492	0.49	0.50	2482	0.49	0.50
Respondent's age	1492	46.09	16.03	2482	49.66	13.08
Respondent's education years	1492	14.00	2.61	2482	13.31	2.16
Having children dummy	1492	0.68	0.47	2482	0.80	0.40
Log of per capita household's income	1492	5.34	0.95	2482	5.17	0.67
Whte dummy	1492	0.90	0.30			
Non-white dummy	1492	0.10	0.30			

Table 2. Results Confidence and Religions

Dependent variable:	Tough love dummy						Extremely spoiling love dummy					
Model:	(1)			(2)			(3)			(4)		
Confidence	0.015	(0.003)	***				0.003	(0.001)	**			
Confidence about spiritual questions				0.009	(0.005)	*				0.004	(0.002)	*
Confidence about non-spiritual questions				0.025	(0.007)	***				0.003	(0.003)	
Religions												
Christan × Deeply religious dummy	-0.012	(0.028)		-0.004	(0.029)		-0.020	(0.009)	**	-0.020	(0.009)	**
Buddhism × Deeply religious dummy	-0.118	(0.047)	**	-0.115	(0.048)	**	0.015	(0.024)		0.015	(0.024)	
Otherwise × Deeply religious dummy	0.112	(0.056)	**	0.118	(0.056)	**	0.000	(0.021)		0.000	(0.021)	
Japanese dummy	-0.178	(0.021)	***	-0.178	(0.021)	***	-0.008	(0.009)		-0.008	(0.009)	
Impatience	-0.044	(0.012)	***	-0.043	(0.012)	***	0.006	(0.005)		0.006	(0.005)	
Debt aversion	0.516	(0.167)	***	0.508	(0.167)	***	0.012	(0.063)		0.013	(0.063)	
Having children dummy	-0.032	(0.021)		-0.032	(0.021)		-0.002	(0.010)		-0.002	(0.010)	
Years of schooling	0.004	(0.004)		0.004	(0.004)		-0.008	(0.002)	***	-0.008	(0.002)	***
Log of per capita household's income	0.027	(0.011)	**	0.027	(0.011)	**	-0.013	(0.004)	***	-0.013	(0.004)	***
Male dummy	0.041	(0.017)	**	0.043	(0.017)	***	0.020	(0.007)	***	0.02	(0.007)	***
Age	0.002	(0.001)	***	0.002	(0.001)	***	0.001	(0.000)	***	0.001	(0.000)	***
African-American dummy	0.020	(0.051)		0.024	(0.051)		0.133	(0.042)	***	0.133	(0.042)	***
Other race dummy	0.021	(0.101)		0.020	(0.101)		-0.016	(0.037)		-0.016	(0.037)	
Log likelihood	-2385			-2384			-803			-803		

Note: The number of observations is 3800 in each models. Tough love dummy is one if respondent answers choice 5 in "Fever" and zero if otherwise. Extremely spoiling love dummy is one if respondent answers choice 1 in "Fever" and zero if otherwise. This is estimated by probit model. The figures are marginal effect. Standard errors are shown in the parentheses. *, **, and *** indicate the variables are significant at 10%, 5% and 1% significance level, respectively.

Table 3. Non-linear decomposition of U.S./Japan gaps in tough love attitudes

	Tough love dummy			Extremely spoiling love dummy		
	(1)			(2)		
Confidence	0.063	(0.008)	***	0.009	(0.003)	***
Christian × Deeply religious dummy	0.020	(0.008)	**	-0.006	(0.003)	*
Buddhism × Deeply religious dummy	0.005	(0.001)	***	-0.001	(0.001)	
Otherwise × Deeply religious dummy	0.002	(0.001)	**	0.000	(0.000)	
Impatience	-0.001	(0.000)	*	-0.001	(0.001)	
Debt aversion	0.008	(0.002)	***	0.000	(0.001)	
Having children dummy	0.005	(0.002)	**	0.000	(0.001)	
Years of schooling	0.004	(0.002)		-0.007	(0.002)	***
Log of per capita household's income	0.007	(0.002)	***	-0.002	(0.001)	***
Male dummy	0.000	(0.000)		0.000	(0.000)	
Age	-0.004	(0.002)	**	-0.007	(0.001)	***
African-American dummy	0.007	(0.004)	*	0.018	(0.004)	***
Other race dummy	0.002	(0.002)		0.000	(0.001)	
Prob (dependent var.=1 | Japanese dummy=0)	0.524			0.066		
Prob (dependent var.=1 | Japanese dummy=1)	0.295			0.057		
Difference	0.229			0.009		
Total explained	0.118			0.004		
Proportion of total explained	51%			43%		
Proportion of confidence explained	27%			104%		

Note: The number of observations is 3800 in each models. Tough love dummy is one if respondent answers choice 5 in "Fever" and zero if otherwise. Extremely spoiling love dummy is one if respondent answers choice 1 in "Fever" and zero if otherwise. Standard errors are shown in the parentheses. *, **, and *** indicate the variables are significant at 10%, 5% and 1% significance level, respectively.

Table 4. Results of worldviews

Panel A: Dependent variable is tough love dummy.								
Model:	(1)		(2)		(3)		(4)	
God or gods exist								
Yes dummy	0.004	(0.021)						
No dummy	0.043	(0.027)						
I always keep my promise								
Yes dummy			0.005	(0.023)				
No dummy			0.063	(0.028)**				
What is written in science text books is true								
Yes dummy					0.007	(0.018)		
No dummy					0.023	(0.026)		
Human beings evolved from other living things								
Yes dummy							0.030	(0.019)
No dummy							0.059	(0.027)**
Confidence	0.013	(0.004)***	0.014	(0.004)***	0.014	(0.004)***	0.013	(0.004)***
Log likelihood	-2384		-2382		-2385		-2383	

Table 4. Results of worldviews (continued)

Panel B: Dependent variable is extremely spoiling love dummy.								
Model:	(1)		(2)		(3)		(4)	
God or gods exist								
Yes dummy	-0.003	(0.009)						
No dummy	-0.020	(0.009)**						
I always keep my promise								
Yes dummy			-0.009	(0.010)				
No dummy			-0.006	(0.011)				
What is written in science text books is true								
Yes dummy					-0.015	(0.007)**		
No dummy					-0.004	(0.010)		
Human beings evolved from other living things								
Yes dummy							-0.003	(0.008)
No dummy							0.003	(0.011)
Confidence	0.004	(0.002)***	0.004	(0.001)**	0.004	(0.001)**	0.003	(0.002)**
Log likelihood	-801		-803		-801		-803	

Note: The number of observation is 3800 in each models. Tough love dummy is one if respondent answers choice 5. in "Fever" and zero if otherwise. Extremely spoiling love dummy is one if respondent answers choice 1. in "Fever" and zero if otherwise. We add the control variables concerning to religious, Japanese dummy, and preference and socioeconomic variable in like manner of estimation models in Table 2. This is estimated by probit model. The figures are marginal effect. Standard errors are shown in the parentheses. *, **, and *** indicate the variables are significant at 10%, 5% and 1% significance level, respectively.

Table 5. Non-linear decomposition of U.S./Japan gaps in tough love attitudes with worldviews

Panel A: Dependent variable is tough love dummy								
Model:		(1)		(2)		(3)		(4)
God or gods exist								
Yes dummy	0.012	(0.008)						
No dummy	-0.002	(0.004)						
I always keep my promise								
Yes dummy			0.030	(0.014)**				
No dummy			0.052	(0.014)***				
What is written in science text books is true								
Yes dummy					0.001	(0.003)		
No dummy					0.013	(0.006)**		
Human beings evolved from other living things								
Yes dummy							-0.003	(0.004)
No dummy							0.022	(0.008)***
Confidence	0.059	(0.009)***	0.049	(0.008)***	0.059	(0.009)***	0.055	(0.009)***
Prob (dependent var.=1 | Japanese dummy=0)	0.524		0.524		0.524		0.524	
Prob (dependent var.=1 | Japanese dummy=1)	0.295		0.295		0.295		0.295	
Difference	0.229		0.229		0.229		0.229	
Total Explained	0.121		0.167		0.125		0.122	
% of total explained	53%		73%		54%		53%	
% of Confidence explained	26%		21%		26%		24%	

Table 5. Non-linear decomposition of U.S./Japan gaps in tough love attitudes with worldviews (continued)

Panel B: Dependent variable is extremely spoiling love dummy.								
Model:		(1)		(2)		(3)		(4)
God or gods exist								
Yes dummy	-0.001	(0.004)						
No dummy	0.003	(0.001)*						
I always keep my promise								
Yes dummy			0.007	(0.006)				
No dummy			-0.003	(0.006)				
What is written in science text books is true								
Yes dummy					0.020	(0.001)		
No dummy					-0.001	(0.003)		
Human beings evolved from other living things								
Yes dummy							0.001	(0.002)
No dummy							0.001	(0.004)
Confidence	0.012	(0.004)***	0.009	(0.003)***	0.010	(0.004)***	0.009	(0.004)***
Prob (dependent var.=1 | Japanese dummy=0)	0.066		0.066		0.066		0.066	
Prob (dependent var.=1 | Japanese dummy=1)	0.057		0.057		0.057		0.057	
Difference	0.009		0.009		0.009		0.009	
Total Explained	0.007		0.007		0.006		0.005	
% of total explained	78%		79%		65%		53%	
% of Confidence explained	128%		98%		110%		99%	

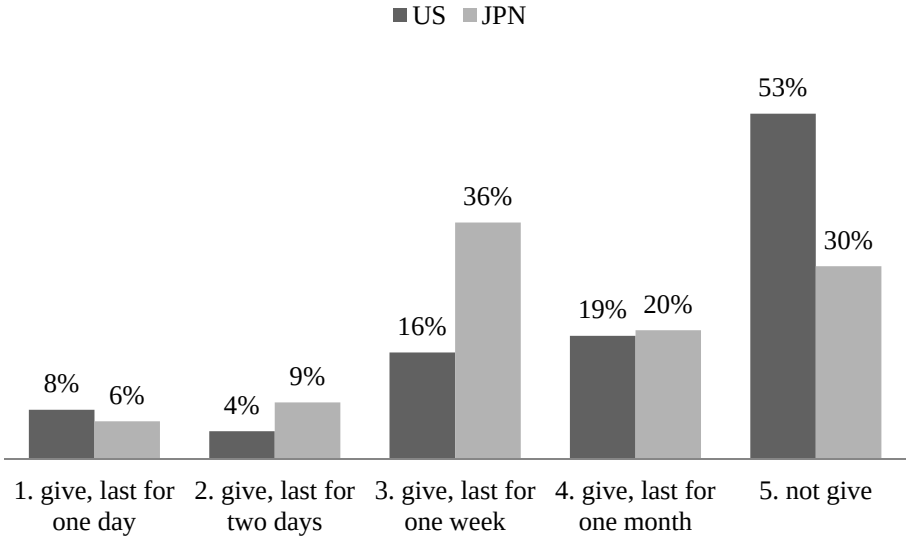
Note: The number of observations is 3800 in each models. Tough love dummy is one if respondent answers choice 5 in "Fever" and zero if otherwise. Extremely spoiling love dummy is one if respondent answers choice 1 in "Fever" and zero if otherwise. We add the control variables in like manner of estimation models in Table 3. Standard errors are shown in the parentheses. *, **, and *** indicate the variables are significant at 10%, 5% and 1% significance level, respectively.

Table 6. Results of "Fever" with "Concert"

Choice:	Tough love		Spoiling love		Selfish	
Confidence	0.015	(0.004)***	-0.015	(0.004)***	0.001	(0.001)
Religions						
Christan × Deeply religious dummy	-0.015	(0.028)	0.020	(0.029)	-0.005	(0.006)
Buddhism × Deeply religious dummy	-0.065	(0.179)	0.141	(0.056)**	-0.076	(0.175)
Ohterwise × Deeply religious dummy	0.112	(0.053)**	-0.122	(0.054)**	0.010	(0.010)
Japanese dummy	-0.162	(0.021)***	0.186	(0.021)***	-0.024	(0.008)***
Impatience	-0.038	(0.012)***	0.040	(0.012)***	-0.002	(0.003)
Debt aversion	0.463	(0.169)***	-0.555	(0.170)***	0.093	(0.043)**
Having children dummy	-0.030	(0.021)	0.041	(0.021)*	-0.011	(0.006)**
Years of schooling	0.005	(0.004)	-0.005	(0.004)	0.000	(0.001)
Log of per capita household's income	0.026	(0.011)**	-0.020	(0.011)*	-0.007	(0.003)**
Male dummy	0.040	(0.016)**	-0.043	(0.017)**	0.002	(0.004)
Age	0.002	(0.001)***	-0.002	(0.001)***	0.000	(0.000)**
African-American dummy	0.026	(0.050)	-0.020	(0.051)	-0.006	(0.010)
Other race dummy	0.075	(0.102)	-0.070	(0.103)	-0.005	(0.020)

Note: The number of observations is 3789. This is estimated by multinominal probit model. Log of simulated-likelihood is -2727. The figures are marginal effect. Standard errors are shown in the parentheses. *, **, and *** indicate the variables are significant at 10%, 5% and 1% significance level, respectively.

Figure 1. Distribution of "Fever"



Note: The choice number indicates the following:
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.

Figure 2. Distribution of “Fever” with “Concert”

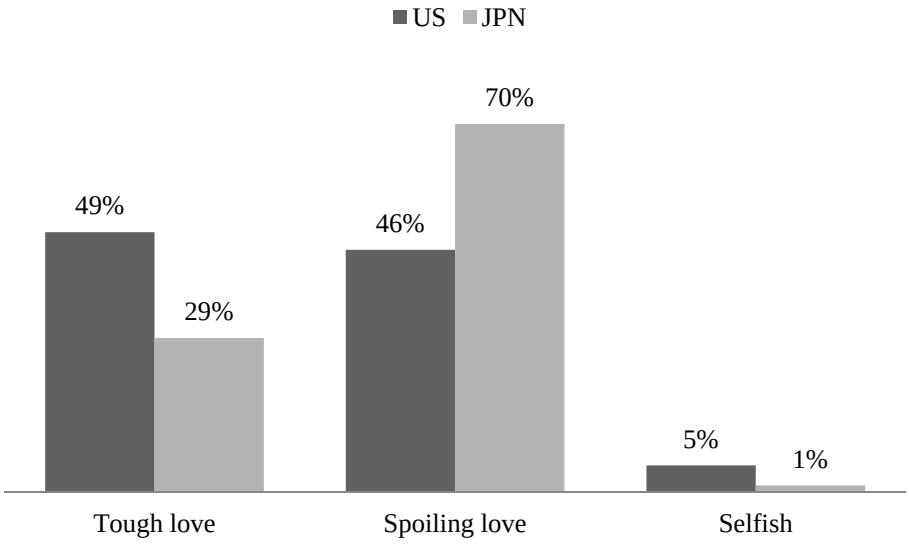
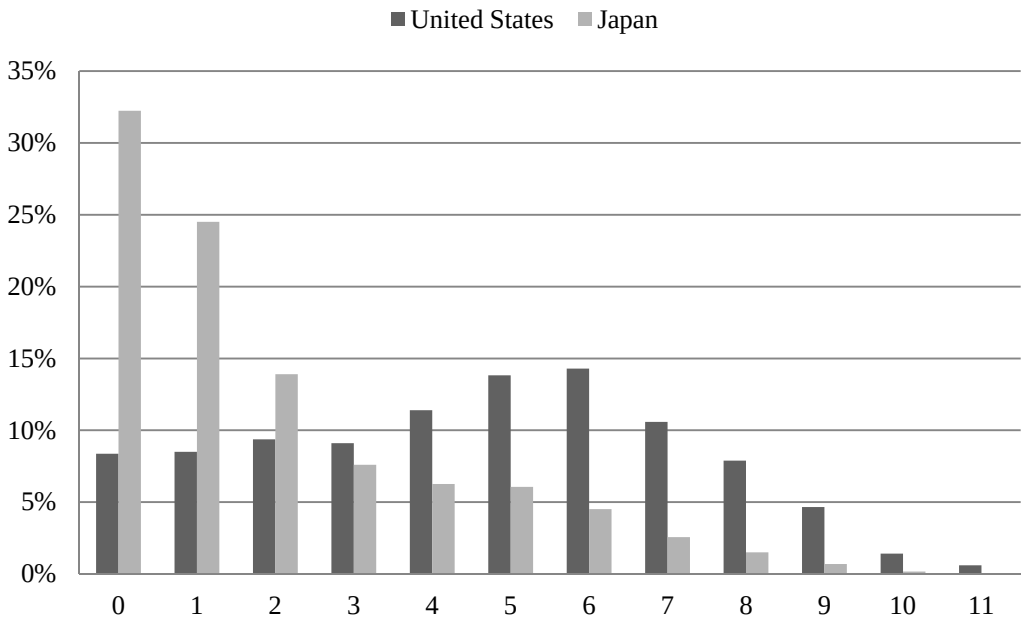
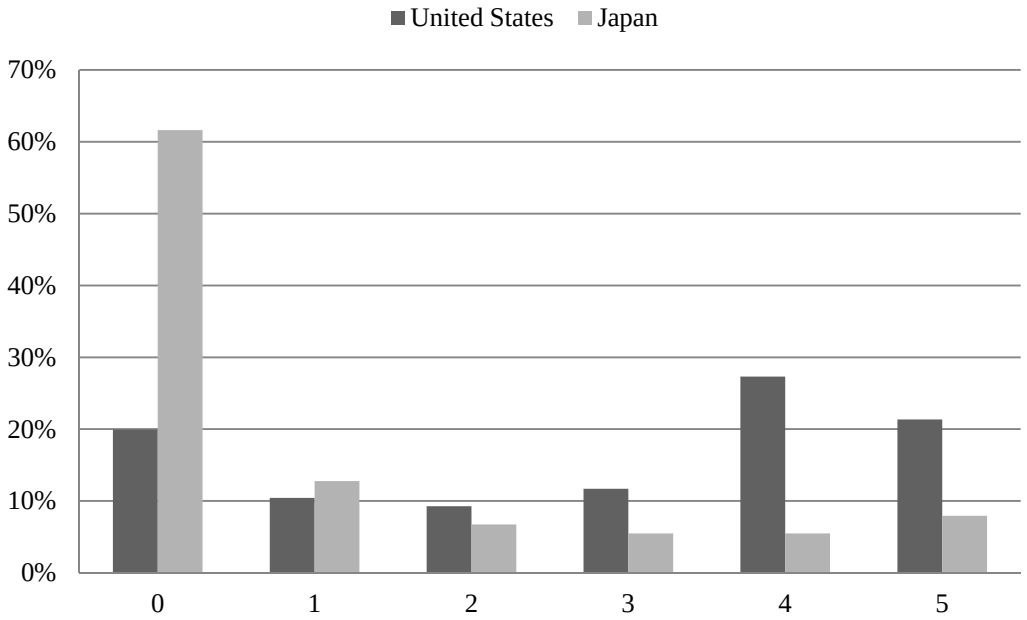


Figure 3. Distribution of "Confidence"



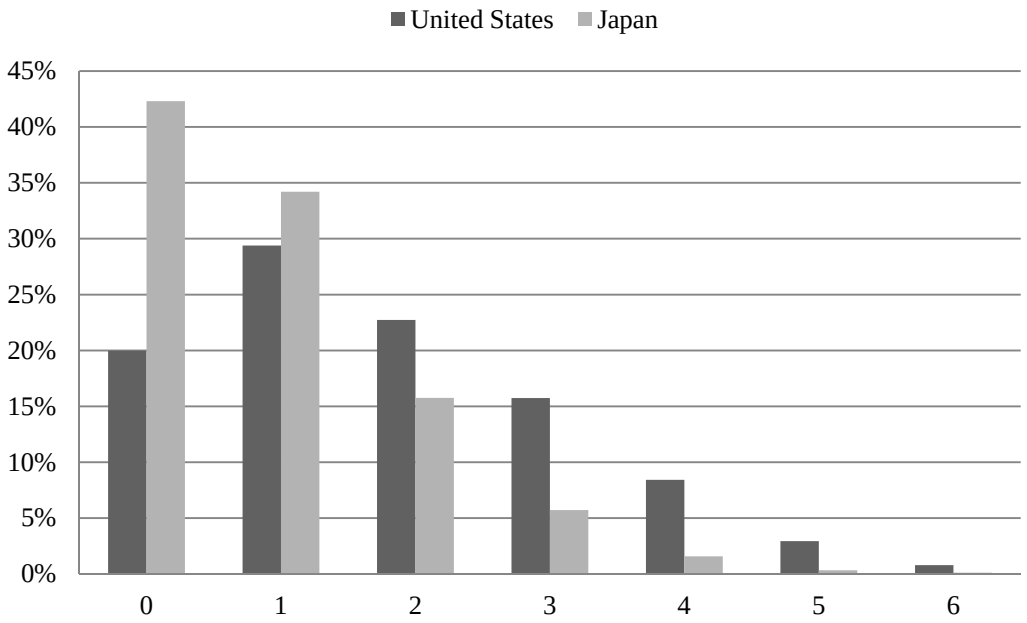
Note: "Confidence" is constructed by summing up the points of "Confidence about spiritual questions" and that of "Confidence about non-spiritual questions."

Figure 4. Distribution of "Confidence about spiritual questions"



Note: In order to construct "Confidence about spiritual questions", we give points to answers to certain questions. We gave 1 point to either Answer 1 "You totally disagree to it." or Answer 5 "You totally agree to it." for each of the following 5 statements: "Life after death exists," "God or gods exist," "God knows about all wrong we've done," "Spirits and Ghosts exist," and "Heaven exists."

Figure 5. Distribution of "Confidence about non-spiritual questions"



Note: In order to construct "Confidence about non-spiritual questions", we give points to answers to certain questions. We gave 1 point to either Answer 1 "You totally disagree to it." or Answer 5 "You totally agree to it." for each of the following 6 statements: "I will never be robbed," "I always keep my promise," "I know a lot about politics," "What is written in science text books is true," "I have a good memory," and "Human beings evolved from other living things."

Appendix 1: Questions about "Worldview" and "Confidence" Variables

Do you agree with the following ideas? If "you totally agree to it", you would choose "1", and if "you totally disagree to it", you would choose "5". Of course, you may choose any number in between.

	You Totally Disagree To It	←		→	You Totally Agree To It
Life after death exists	1	2	3	4	5
God or Gods exist	1	2	3	4	5
God knows about all the wrong we've done	1	2	3	4	5
Human beings evolved from other living things	1	2	3	4	5
I will never be robbed	1	2	3	4	5
Spirits and Ghosts exist	1	2	3	4	5
What is written in science text books is true	1	2	3	4	5
Heaven exists	1	2	3	4	5
A person's blood type indicates their character	1	2	3	4	5

Do the following statements hold true for you? If "it is particularly true for you", you would choose "5", and if "it doesn't hold true at all for you", you would choose "1". Of course, you may choose any number in between.

	It Doesn't Hold True At All For You	←		→	It Is Particularly True For You
I am deeply religious	1	2	3	4	5
I always keep my promise	1	2	3	4	5

I know a lot about politics	1	2	3	4	5
I have a good memory	1	2	3	4	5

Appendix 2: Questions about Religious Affiliations

Please indicate if you are affiliated with any of the following religions.

Options in United States

1. Baptist	7. Other Protestant	13. Islam
2. Episcopalian	8. Roman Catholic	14. Judaism
3. Evangelical	9. Orthodox Christian	15. Scientology
4. Lutheran	10. Other Christian	16. Some other affiliation not listed above
5. Presbyterian	11. Buddhism	17. None
6. United Methodist	12. Hinduism	18. Prefer not to answer

Options in Japan

1. None	4. Other Christian	7. Hinduism
2. Catholic	5. Judaism	8. Buddhism
3. Protestant	6. Islam	9. Otherwise

Appendix 3: Questions about Patience and Income

Appendix 1

Household income

Approximately how much was the annual earned income before taxes and with bonuses included of your entire household for 2007? *(If you are student, please answer the income of your parents' entire household.)*

(X ONE Box)

01 Y Less than $10,000
02 Y $10,000 to less than $20,000
03 Y $20,000 to less than $40,000
07 Y $100,000 to less than $120,000
08 Y $120,000 to less than $140,000
09 Y $140,000 to less than $160,000

04 Y $40,000 to less than $60,000
05 Y $60,000 to less than $80,000
06 Y $80,000 to less than $100,000
10 Y $160,000 to less than $180,000
11 Y $180,000 to less than $200,000
12 Y More than $200,000

Household financial asset

Approximately how much would the balance of financial assets (savings, stocks and insurance, etc.) of your entire household be? *(If you are a student, please answer the balance of financial assets of your parents' entire household.)* **(X ONE Box)**

01 Y Less than $25,000
02 Y $25,000 to less than $50,000
03 Y $50,000 to less than $75,000
04 Y $75,000 to less than $100,000
05 Y $100,000 to less than $150,000
06 Y $150,000 to less than $200,000
07 Y $200,000 to less than $300,000
08 Y $300,000 to less than $500,000
09 Y $500,000 to less than $1,000,000
10 Y $1,000,000 or more

Impatience(1)

Let's assume you have **two options** to receive some money.
You may choose Option "A", to receive $100 in **two days**; or Option "B", to receive a different amount in **nine days**. *Compare the **amounts** and **timing** in Option "A" with Option "B" and indicate which amount you would prefer to receive for all 8 choices.*

Option "A" Receiving In 2 Days	*or*	Option "B" Receiving In 9 Days	*Includes An Annual Interest Rate Of:*	→	Which ONE do you prefer? (X ONE Box For EACH Row) Option "A"	Option "B"
$100.00		$99.81	-10%		1 Y	2 Y
$100.00		$100.00	0%		1 Y	2 Y
$100.00		$100.19	10%		1 Y	2 Y
$100.00		$100.38	20%		1 Y	2 Y
$100.00		$100.96	50%		1 Y	2 Y
$100.00		$101.91	100%		1 Y	2 Y
$100.00		$103.83	200%		1 Y	2 Y
$100.00		$105.74	300%		1 Y	2 Y

Impatience(2)

Now let's assume that you have the option to receive $100 in **ninety days** or receive a different amount in
ninety-seven days. *Compare the **amounts** and **timing** in Option "A" with Option "B" and indicate which amount you would prefer to receive for all 8 choices.*

Option "A"	Option "B"	*Includes*	Which ONE do you prefer?

Receiving In 90 Days	*or*	Receiving In 97 Days	*An Annual Interest Rate Of:*	→	(X ONE Box For EACH Row) Option "A"	Option "B"
$100.00		$99.81	-10%		1 Y	2 Y
$100.00		$100.00	0%		1 Y	2 Y
$100.00		$100.19	10%		1 Y	2 Y
$100.00		$100.38	20%		1 Y	2 Y
$100.00		$100.96	50%		1 Y	2 Y
$100.00		$101.91	100%		1 Y	2 Y
$100.00		$103.83	200%		1 Y	2 Y
$100.00		$105.74	300%		1 Y	2 Y

Impatience(3)

Now let's assume that you have the option to receive $100 in **one month** or receive a different amount in **thirteen months**. *Compare the **amounts** and **timing** in Option "A" with Option "B" and indicate which amount you would prefer to receive for all 8 choices.*

Option "A" Receiving In 1 Month	*or*	Option "B" Receiving In 13 Months	*Includes An Annual Interest Rate Of:*	→	Which ONE do you prefer? (X ONE Box For EACH Row) Option "A"	Option "B"
$100		$95	-5%		1 Y	2 Y
$100		$100	0%		1 Y	2 Y
$100		$102	2%		1 Y	2 Y
$100		$104	4%		1 Y	2 Y
$100		$106	6%		1 Y	2 Y
$100		$110	10%		1 Y	2 Y
$100		$120	20%		1 Y	2 Y
$100		$140	40%		1 Y	2 Y

Impatience(4)

Now let's assume that you have the option to receive $10,000 in **one month** or receive a different amount in **thirteen months**. *Compare the **amounts** and **timing** in Option "A" with Option "B" and indicate which amount you would prefer to receive for all 8 choices.*

Option "A" Receiving In 1 Month	*or*	Option "B" Receiving In 13 Months	*Includes An Annual Interest Rate Of:*	→	Which ONE do you prefer? (X ONE Box For EACH Row) Option "A"	Option "B"
$10,000		$9,500	-5%		1 Y	2 Y
$10,000		$10,000	0%		1 Y	2 Y
$10,000		$10,010	0.1%		1 Y	2 Y
$10,000		$10,050	0.5%		1 Y	2 Y
$10,000		$10,100	1%		1 Y	2 Y
$10,000		$10,200	2%		1 Y	2 Y

$10,000	$10,600	6% ..... 1 Y	2 Y
$10,000	$11,000	10% ..... 1 Y	2 Y

Impatience(5)

Now let's assume that you have the option to **pay** $10,000 in **one month** or **pay** a different amount in **thirteen months**. *Compare the **amounts** and **timing** in Option "A" with Option "B" and indicate which amount you would prefer to **pay** for all 8 choices.*

Option "A"		**Option "B"**	***Includes An Annual Interest Rate Of:***	→	**Which ONE do you prefer? (X ONE Box For EACH Row)**	
Paying In 1 Month	*or*	**Paying In 13 Months**			**Option "A"**	**Option "B"**
$10,000		$9,500	-5% ..... 1 Y			2 Y
$10,000		$10,000	0% ..... 1 Y			2 Y
$10,000		$10,010	0.1% ..... 1 Y			2 Y
$10,000		$10,050	0.5% ..... 1 Y			2 Y
$10,000		$10,100	1% ..... 1 Y			2 Y
$10,000		$10,200	2% ..... 1 Y			2 Y
$10,000		$10,600	6% ..... 1 Y			2 Y
$10,000		$11,000	10% ..... 1 Y			2 Y

Appendix 4: Construction of the Patience Variables

The patience variables, "patience(1)",…, "patience(5)" are estimated through the following procedure. In the questionnaires, a respondent was supposed to choose appropriate range containing the corresponding amount of receiving cash, instead of writing down the exact figures. Using that information, the expected value of each classification will be estimated as follows.

First, assume that each of those income variables, θ, follow the log-normal distribution, or

$$x \equiv \ln\theta \sim N(\mu, \sigma)$$

where μ and σ denote the mean and standard deviation of the normal distribution respectively. When there are J classes $(c = 1, \dots, J)$, the probability for $\theta$of individual

i, $x_i = \ln\theta_i$ i to be jth class can be expressed as:

in *j*th class can be expressed as:

$$P(c = j) = P\left(\ln\underline{\theta}_j < x_i < ln\overline{\theta}_j\right) = \Phi\left(\frac{\ln\overline{\theta}_j - \mu}{\sigma}\right) - \Phi\left(\frac{\ln\underline{\theta}_j - \mu}{\sigma}\right),$$

where $\overline{\theta}_j$ and $\underline{\theta}_j$ means the upper and lower bounds of θ respectively in the Jth class, printed in the questionnaires. The mark Φ, in addition, denotes the cumulative distribution function of the normal distribution. The logarithm of the above probability with respect to every respondent will constitute a log-likelihood function defined as:

$$L(\mu, \sigma|c) = \sum_{i\in I}\sum_{j\in J} 1[c_i = j]\ln P(c = j)$$

Let $1[c_i = j]$ signifies the variable to take one for the inclusion of individual i in class j; otherwise, it equals zero. The letter I and J indicate the total number of respondents and classes respectively. Employing the parameter μ and σ through the maximum likelihood estimation with the log-likelihood function, each expected value of θ in J can be calculated with the following equation (Kimball et al., 2005).

$$E\left(\theta_i\middle|\ln\underline{\theta}_j < x_i < ln\overline{\theta}_j\right) = \exp\left(\mu + \frac{\sigma^2}{2}\right)\frac{\int_{\ln\underline{\theta}_j}^{\ln\overline{\theta}_j}\frac{1}{\sqrt{2\pi}\sigma}\exp\left(\frac{-(y-\mu-\sigma^2)^2}{2\sigma^2}\right)dy}{\int_{\ln\underline{\theta}_j}^{\ln\overline{\theta}_j}\frac{1}{\sqrt{2\pi}\sigma}\exp\left(\frac{-(y-\mu)^2}{2\sigma^2}\right)dy}.$$