

Cultural Transmission of Diligence: Parenting and Worldviews

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Summary (Purpose & Approach)

- **【Purpose】**: To investigate the mechanism of cultural transmission of diligence.
- **【Approach】**: Empirical analysis by two micro-data sets.
 1. *Japan Household Panel Survey (JHPS) 2nd wave*
 2. *Japan Child Panel Survey 1st wave (JCPS)*
 - Proxy for diligence is study hours.
 - Instrumental variable method: Parenting is endogenous variable because parents may change their parenting behaviors according to their children's characters and behaviors.
 - Our instrument is a parent's worldview about suffering that affects economic behavior.

Summary (Main results)

1. Tough parenting tends to increase child's study hours.
 2. A parent's worldview about suffering has an impact on child's study hours through the parent's discipline behavior.
- These results indicate that tough parenting by a parent with a worldview that experiencing a hardship is helpful for the child's personal development tends to help the child grow to be diligent.

Summary(Why diligence?)

- Diligence is one kind of non-cognitive ability that relates to economic performances.
 - Study hours of diligent children tend to be longer, they tend to show better performance at school and at work.
 - Endogenous preference formation model: c.f. Doepke and Zilibotti (2008), which is one of the studies of cultural transmission, focused on diligence as a preference prescribing economic behavior.
 - Worldviews can be seen as one kind of background of culture: Parental worldview has a impact on cultural transmission of diligence.

1. Introduction

Cultural transmission

- This paper is part of cultural transmission that is surveyed by Bisin and Verdier(2011)
- Doepke and Zilibotti(2008)
 - In their model, parents shape their children's preferences in response to economic incentives.
 - Here children's preferences are the rate of time preference (patience) and the taste for leisure (or, conversely, work ethic).

Diligence

- Diligence is one kind of non-cognitive ability that relates to economic performances.
- Not only cognitive ability, non-cognitive ability is also a significant factor in determining performance at school such as test scores and work performance such as wage rates (Heckman and Rubinstein, 2001; Heckman, Stixrud, and Urzua, 2006).
- Diligence is important for determining measures of economic performance emphasized in traditional economics such as wages, but it may also be important for subjective well-being.

Well-being and moral

- List of concepts by Frey(2008, p.5)
 1. Well-being as temporally emotion
 2. Well-being as utility defined by traditional economics
 3. *Eudaimonia* is Aristotle's concept of happiness as a "good life" defined by the acquisition and use of virtue and ability
- To fulfill *Eudaimonia*, we should acquire moral virtues, e.g. diligence.

Formation of diligence

- In the studies of cultural transmission, parents' economic behavior shape their children's preference.
- we focus on parenting as parents' behavior.
- Our paper empirically analyze the impact of parenting on their children's diligence.
 - Endogeneity issue (reverse causality): Parents are likely to discipline their children more often if they observe that they are not diligent.

Worldviews

- We employ instrumental variable method to cope with the endogeneity issue and use worldviews as instruments.
- The word “worldview” has been used in philosophy since Kant’s (1790) was originally published in 1790.
- In philosophy, worldviews is mainly cognition of world (origin, terminal, sense, moral, well-being, etc)

Culture and Worldviews

- In anthropology, worldviews include not only cognition of world but also emotion.
- The use of the word in anthropology that started in the middle of the 20th century seems especially useful for studying culture in economics.
- Hiebert (2008, pp. 25-26) defines “worldview” in anthropological terms as “the foundational cognitive, affective, and evaluative assumptions and frameworks a group of people makes about the nature of reality which they use to order their lives.”

Worldviews about suffering

- Worldviews about suffering of sick and accident (ex. A movie based on a true story of Bethany Hamilton who lost her left arm: “Soul Surfer”)
- Worldviews about suffering
 1. “Hardship is helpful for character building” (positive attitude)
 2. “Hardship is a result of sinful behaviors in the past” (negative attitude)
 3. “Hardship is an accident that is meaningless” (meaningless)

Subjective probabilities attached to worldview beliefs

- Under the Globalization, people have several worldviews and cultural identities.
- We attach subjective probabilities to each belief in a worldview
- We think that the degree of confidence in worldview beliefs has an impact on economic behaviors.
- We use questionnaires to measure the subjective probabilities attached to beliefs

Instruments

- Our instrumental variable is a parental worldview about suffering
- One shot (cross-sectional) data satisfy the conditions of instruments for parenting.
 - Exogeneity condition: Worldviews are exogenous for diligence except through parenting.
 - Relevance condition: Worldviews relate to parenting.
- We test the hypothesis that parental worldviews have an impact on their children's diligence through parenting.

Outline

2. Empirical Model
3. Data
4. Results
5. Conclusion

2. Empirical Model

Endogeneity issue

- Reverse causality: Parents could decide how to parent their children owing to the degree of their children's diligence.
- Identification strategy
 - Instrumental variable approach (IV)
 - Treatment-effect model (TEM)

Empirical model

- $H_i = \beta_0 + \beta_1 P_i + X_i \beta_2 + u_i$
 - H_i : child's study hours
 - P_i : parenting dummy
 - X_i : vector of parents' and child's attributes
 - u_i : mean zero disturbance

Treatment-effect model (TEM)

- TEM is parametric model when dependent variable is continuous and endogenous variable is indicator.
 - Maddala (1983), pp.120-122
 - Greene (2007), pp.889-891
 - Stata command *treatreg*
- Advantage
 - If disturbance is bivariate normal, the estimators by TEM are more efficient than those by IV.

Treatment-effect model (TEM)

$$H_i = \beta_0 + \beta_1 P_i + X_i \beta_3 + u_i$$

$$P_i^* = \gamma_0 + \gamma_1 W_i + e_i$$

$$P_i = \begin{cases} 1 & \text{if } P_i^* > 0 \\ 0 & \text{if otherwise} \end{cases}$$

- u_i and e_i are bivariate normal with mean zero and covariance matrix. ρ is correlation between u_i and e_i .

$$\begin{bmatrix} \sigma^2 & \rho\sigma \\ \rho\sigma & 1 \end{bmatrix}$$

3. Data

Data

1. *Japan Household Panel Survey (JHPS) 2nd wave*
2. *Japan Child Panel Survey 1st wave (JCPS)*

Japan Household Panel Survey (JHPS)

- The JHPS has started since 2009 for which households were interviewed once a year in January.
 - The initial sample size is 4,022.
- Population and sampling method:
 - The sample are selected randomly from over 20 years old across Japan using the Basic Residents Registration System.
 - 2nd stratified sampling
 - For detail, see Naoi and Yamamoto (2010)
- JHPS is a representative data of the total Japanese population.

Japan Child Panel Survey (JCPS)

- The JCPS is a subsample of the 2nd wave JHPS.
 - The targets of the JCPS are the JHPS respondents who have primary school or junior high school children and the children.
 - The sample size is 439.
 - The JCPS not only contains several questions about home environment toward parents but also conducts an achievement test toward children and asks the children their study hours and study circumstances.
 - For detail, see Yamashita et al. (2011)

JCPS-continued

- Sample selection (Yamashita et al., 2011)
 1. The cooperation rates (= actual respondents of JCPS / potential respondents) tend to decline as children upgrades.
 2. The cooperation rates drop at 6th grade in elementary school.
 3. If mother is regular worker, the cooperation rate is low.

Child's study hours

- Proxy for child's diligence
- “Excluding the period leading up to exams, how much time does your child (you) usually spend studying after he/she comes home from school? (Please include time spent in any kind of supplementary school/test preparation school or in private tutoring.)”

Table 1. Child's study hours by grades

Response by:	Parent			Child			Mean		
	Obs.	Mean	S.D.	Obs.	Mean	S.D.	Obs.	Mean	S.D.
Grade in an elementary school									
1 st	58	0.61	0.33	0	-	-	58	0.61	0.33
2 nd	43	0.69	0.46	0	-	-	43	0.69	0.46
3 rd	60	0.71	0.42	0	-	-	60	0.71	0.42
4 th	44	0.80	0.48	36	0.87	0.59	36	0.82	0.46
5 th	57	1.17	0.80	49	1.31	1.05	49	1.23	0.89
6 th	37	1.14	1.17	33	1.26	1.14	33	1.17	1.00
Grade in a junior high school									
1 st	55	1.22	0.97	55	1.66	1.31	55	1.44	1.02
2 nd	46	1.30	0.82	46	1.99	1.17	46	1.65	0.83
3 rd	39	1.29	1.11	39	1.51	1.09	38	1.42	0.94
Total	439	0.98	0.80	258	1.47	1.15	418	1.06	0.82

Parental worldview

- Our instruments for parenting are constructed from data about subjective probabilities parents attached to worldview beliefs about suffering
- Parental worldview determines how to parent their children. (Ogaki, 2000; Kubota et al., 2012b)
 - Considering children's future, parent with worldview such that hardship is helpful for character building dares to give tough parenting (altruistic behavior).

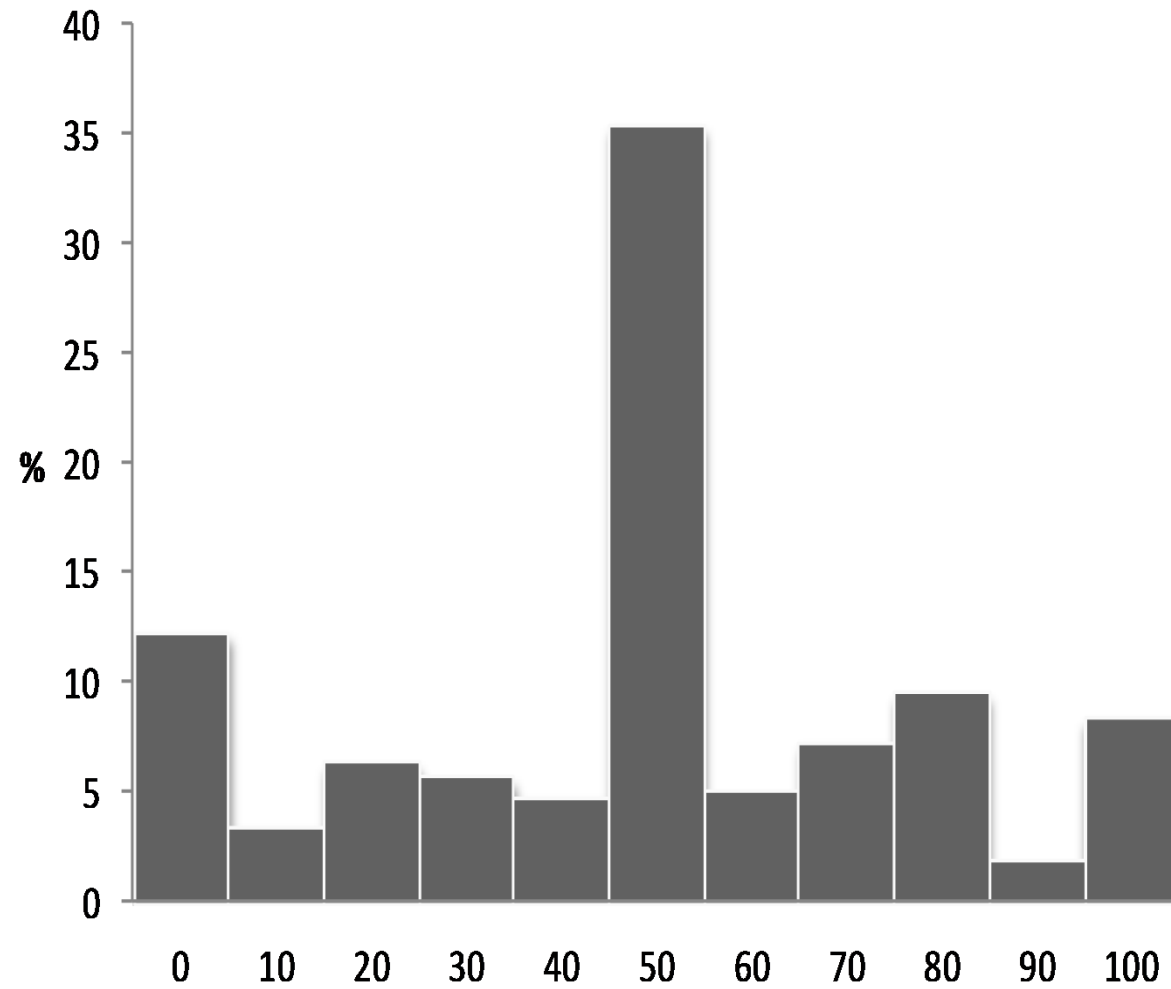
Measuring subjective probabilities attached to worldview beliefs

- “Circle the appropriate number for each of the following questions. Choose 0 if you totally disagree with the statement. Choose 50 if you partially agree with the statement (50%). Choose 100 if you completely agree with the statement.”

If you are experiencing a hardship, such as if you had an accident, undergoing the hardship itself is helpful for character building.

0	10	20	30	40	50	60	70	80	90	100
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Figure 1. Parental worldviews



Parenting

- “Before they started elementary school, when your child threw a tantrum in a store and made a scene because they wanted toys/candy, what did you do? Please circle all items that apply.”

Figure 2. Parenting

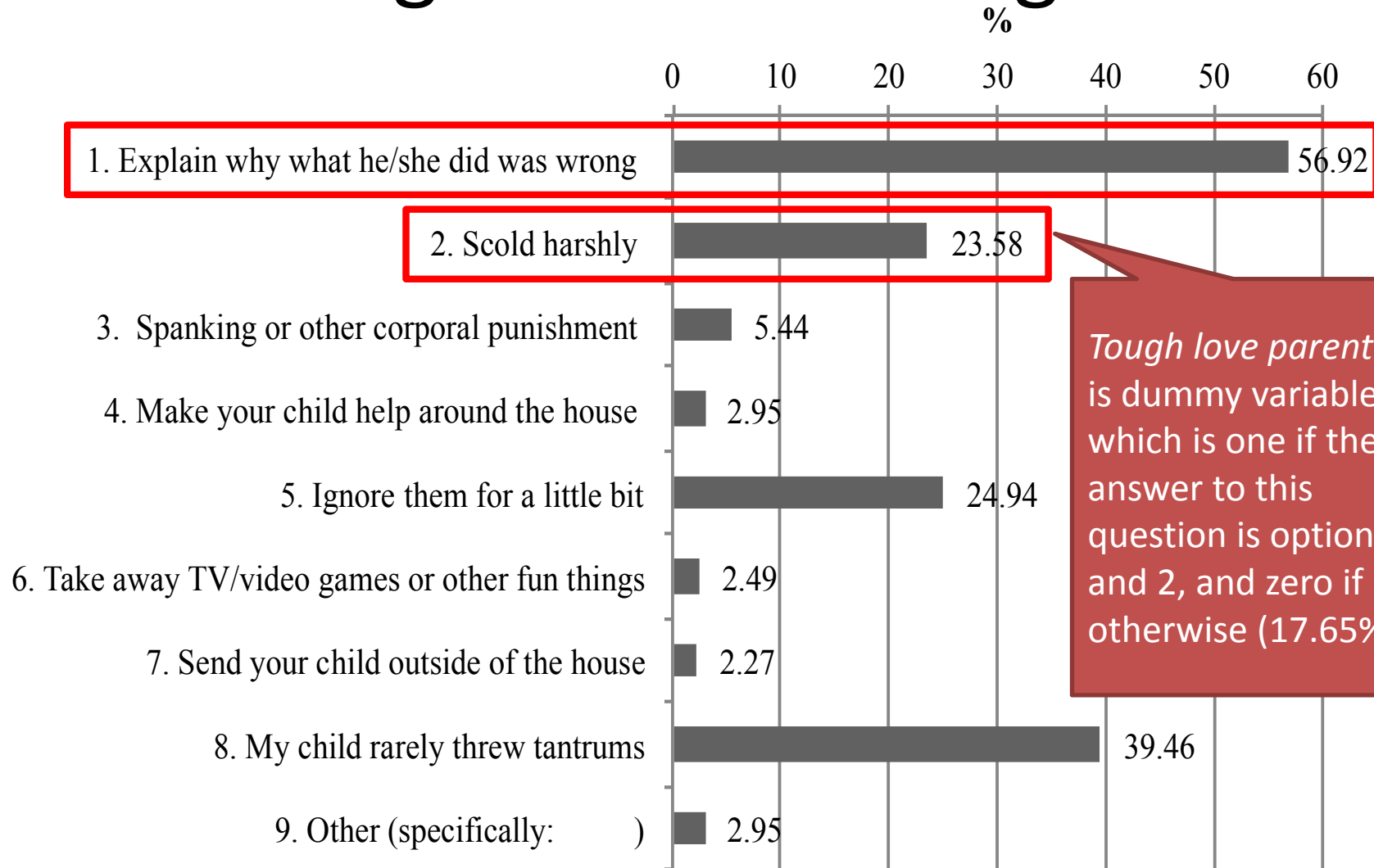


Table 2. Days of supplementary school by grades

	Obs.	Mean	Min	Median	Max	S.D.
Grade in an elementary school						
1 st	57	0.11	0.00	0.00	3.00	0.45
2 nd	41	0.17	0.00	0.00	2.00	0.50
3 rd	54	0.22	0.00	0.00	3.00	0.63
4 th	43	0.14	0.00	0.00	2.00	0.47
5 th	54	0.76	0.00	0.00	5.00	1.34
6 th	34	0.85	0.00	0.00	7.00	1.62
Grade in a junior high school						
1 st	53	0.72	0.00	0.00	3.00	1.10
2 nd	46	1.35	0.00	1.00	4.00	1.32
3 rd	38	1.76	0.00	1.00	6.00	1.91
Total	420	0.64	0.00	0.00	7.00	1.23

Table 3. Descriptive Statistics

	Obs.	Mean	S.D.	Min	Max
<u>Parental attributes</u>					
Family income	416	503.89	214.45	20	1400
Male dummy	441	0.50	0.50	0	1
Birth year / 100	441	19.68	0.06	19.44	19.84
College or more dummy	438	0.29	0.46	0	1
Household size	441	4.57	1.10	1	9
Number of children	441	2.31	0.74	1	5
<u>Child attributes</u>					
Child male dummy	441	0.51	0.50	0	1
Oldest child dummy	441	0.41	0.49	0	1

4. Results

Results

1. Parenting and Parental Worldview
2. The effects of tough love parenting on child's study hours
3. Results by OLS

Table 4. Parental worldview and parenting

	(1)	(2)	(3)
<u>Parental worldview</u>			
Suffer	0.05 [0.07]		
Suffer dummies (Reference is Suffer 50)			
Suffer 0		-0.25 [0.10]***	-0.30 [0.10]***
Suffer 10-40		0.11 [0.05]**	
Suffer 60-90		0.06 [0.05]	
Suffer 100		-0.05 [0.08]	
<u>Parental attributes</u>	Yes	Yes	Yes
<u>Child attributes</u>	Yes	Yes	Yes
Log of pseudo-likelihood	-154.8	-145.28	-149.01

Table 5. The effects of parenting on child's study hours

	TE	TE	2SLS	IV
	(1)	(2)	(3)	(4)
Tough love parenting	1.08***	1.07***	1.02**	1.38**
	[0.13]	[0.11]	[0.48]	[0.67]
Instruments				
Suffer 0	Yes	Yes	Yes	Yes
Suffer 10-40	Yes	-	Yes	-
Suffer 60-90	Yes	-	Yes	-
Suffer 100	Yes	-	Yes	-
Log of pseudo-likelihood	-512.1	-516.7		
Wald statistics	65.43	79.48		
[p-value]	[0.00]	[0.00]		
Partial R squared			0.04	0.02
F statistics			5.33	15.90
[p-value]			[0.00]	[0.00]
Hansen J statistics			2.87	
[p-value]			[0.41]	

Table 6. The effects of parenting on child's study hours: OLS

	(1)	(2)	(3)
Tough love parenting	-0.13 [0.09]	-0.12 [0.10]	-0.07 [0.09]
<u>Parental attributes</u>			
Family income (Reference is 1 st quartile)			
2 nd quartile		0.14 [0.14]	0.15 [0.13]
3 rd quartile		0.11 [0.11]	0.06 [0.10]
4 th quartile		0.23 [0.12]*	0.14 [0.11]
Male dummy		0.07 [0.08]	0.01 [0.07]
Birth year / 100		-0.23 [0.83]	-0.04 [0.75]
Callege or more dummy		-0.09 [0.08]	-0.09 [0.07]
Household size		0.01 [0.04]	0.05 [0.03]
Number of children		-0.08 [0.06]	-0.07 [0.06]
<u>Child attributes</u>			
Child male dummy		0.10 [0.08]	0.06 [0.07]
Oldest child dummy		0.03 [0.08]	0.02 [0.08]
Private-tutoring school	No	No	Yes
Grade dummies	No	Yes	Yes
Scale dummies for regional population	No	Yes	Yes
Constant	0.65 [0.05]***	5.13 [16.30]	1.29 [14.81]
Adjusted R squared	0.21	0.20	0.33

5. Conclusion

Conclusion

- To uncover the mechanism of cultural transmission, this paper empirically analyzes the effects of parenting on child's diligence.
- Endogeneous issue (reverse causality): Parents are likely to discipline their children more often if they observe that they are not diligent.
- We employ instrumental variable method and treatment-effect model. Our instrument is parental worldview that governs economic behavior.

Main results

1. Tough love parenting increases child's study hours about one hour in a day.
2. Parental worldview about hardship has an impact on their child's study hours through parenting.
 - This result indicates that child's preference about his leisure and time preference could be endogenous variable.