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Abstract

This paper investigates the effects of the informal school curriculum (hidden curriculum) on subsequent preference formation. The estimation results using Japanese data show that the hidden curriculum at public elementary schools varies widely from place to place, and is associated with preference formation. In particular, those who have experienced "participatory and cooperative learning" practices are more likely to be altruistic, cooperative, reciprocal, and have national pride. In contrast, the influence of educational practices emphasizing "anti-competition" is negatively associated with these attributes. Robustness checks also show that our estimates are less likely to be biased due to omitted variables or reverse causality. These findings imply that elementary school education, as a place for early socialization, plays a role in the formation of social preferences.

Keywords: Cultural transmission, Socialization, Preferences, Beliefs, Informal school curriculum, Elementary education, Japan
JEL Classification: D83; I21; Z13

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1. Introduction

Recently, an increasing number of social scientists have been interested in how a culture is transmitted to people within a society. In the field of so-called cultural transmission (or socialization), many studies have documented socialization mechanisms of preferences, beliefs, and/or norms.[1] Such mechanisms can be broadly classified into two channels: direct vertical socialization (through family) and oblique and horizontal socialization (through, for example, neighbors, friends, and teachers).

Among the mechanisms of the latter, school education is perceived to be an effective measure for promoting a common culture within society (Gradstein and Justman, 2005). Nevertheless, there have been only a few empirical investigations on the role of schooling. While there is a vast literature on the role of family, there is a lack of empirical evidence regarding a specific mechanism of oblique/horizontal socialization. As an exception, Algan et al. (2013) examined whether teaching practices at school influence students' beliefs, and found a positive causal relationship between "working in groups" practices and students' beliefs in cooperation and trust using macro and micro data covering multiple countries.[2]

However, an important question remains to be answered. Because the data they used were mainly from school surveys of students' academic performance, they quantified only contemporaneous effects of teaching practices on students' beliefs, although, at the same time, their analysis successfully addresses the identification issue regarding unobserved heterogeneity among schools due to the advantages of the school-survey data. They also conducted a cross-country-analysis, in which dependent variables are country-averaged values (the sample mainly comprises an adult population). However, because the teaching

[1] See Bisin and Verdier (2011) for an extensive review of the literature in this field.

[2] Aspachs-Bracon et al (2008) also provide evidence on the role of schooling on cultural transmission. They found a linkage between language education and the formation of national identity in Spain (Catalonia and the Basque Country). On the other hand, there is some indirect evidence regarding the role of education. For instance, several authors have found that years of education (quantity of schooling) are associated with civic participation (Milligan et al. 2004; Helliwell and Putnam 2007). In addition, Hryshko et al. (2011) found a relationship between parents' education and risk attitude of their children.

practices they employed are those used currently (recently), the estimates may not capture the direct influences of past education on subsequent preference formation, and may also confound reverse causality. Consequently, their investigation is completely silent on whether teaching practices have a persistent effect on peoples' preferences and beliefs over years or decades.

In this paper, we tackle the question. Using original survey data on people aged between 20 and 59 in Japan, we quantify the effects of experiences at elementary school on subsequent preference formation. Furthermore, our empirical investigation is more comprehensive than that of Algan et al. (2013) in two aspects. First, we focus on several (informal) educational contents and practices, which include "working in groups" practices as well. Second, the social preferences we investigate in this paper include altruism and reciprocity, as well as beliefs in cooperation and trust investigated by Algan et al. (2013). Thus, our analysis can explore the role of schooling on socialization from several perspectives.

In an empirical context, the first distinction is very important. The identification issue is one of the most difficult problems when conducting empirical investigations on the causal linkage between school education and preference formation. Because students (or parents) can usually choose their own school, there is a possibility that educational contents/practices they receive at school also have an endogenous outcome. This potential self-sorting makes it difficult to identify the effects of educational contents/practices. Moreover, educational contents/practices often may not vary within a country. This is because school education, especially at public elementary schools, is usually regulated by national education policy. If this is the case, it is impossible to distinguish the effects of education from other macro factors unless data covering multiple countries are available, as in the case of Algan et al. (2013).

In the Japanese education system, educational contents/practices at elementary to high school are based on the curriculum guideline of the Japanese government. However, while all public schools aim to provide universal education based on the same school curriculum, informal contents/practices differ greatly from region to region. In other words, alongside the formal school curriculum, there seems to exist an informal school curriculum, the so-called "hidden curriculum," which determines informal contents/practices. This situation provides a desirable basis for identification.

Because public school education in Japan is provided under the same curriculum already discussed, parents believe that all public schools provide universal education including the hidden curriculum. This is also enhanced by the educational administration system, in which educational administration is operated on a prefectural basis, in principle; therefore, educational contents/practices become similar among neighboring schools in a prefecture. In addition, almost all elementary schools are operated publicly (99%) and parents have no school choice at the level of elementary education due to the school district system. As a consequence, it is unlikely that parents choose elementary schools based on informal educational contents/practices (hidden curriculum). Therefore, focusing on the hidden curriculum enables us to avoid a potential bias due to a self-sorting problem and to quantify its effects on preference formation.

The rest of the paper is organized as follows. Section 2 describes informal educational contents/practices (hidden curriculum) in Japan and datasets used in the analysis. Section 3 presents an econometric framework and discusses the validity of its identification assumptions. Section 4 reports empirical results. The results show that informal education practices (hidden curriculum) vary greatly between prefectures, which are the uppermost educational administrative unit operating public elementary schools, and that the hidden curriculum has a non-negligible influence on the formation of social preferences. In particular,

education emphasizing participatory and cooperative learning is effective for cultivating positive social preferences. Finally, Section 5 concludes the paper.

2. Educational Contents and Practices and Hidden Curriculum in Japan

The contents and practices of school education are basically stipulated in the school curriculum. In the case of elementary to high school in Japan, the curriculum is based on the School Curriculum Guideline (*Gakushu Sidou Youryou*) of the Ministry of Education, Culture, Sports, Science and Technology (MEXT).[3] However, while all public schools aim to provide universal education based on the same guideline, informal contents/practices differ greatly from region to region. In other words, alongside the formal school curriculum, there seems to exist an informal school curriculum, the so-called hidden curriculum. It is based on preferences, beliefs, and/or norms of teachers or a school/community, and determines informal educational contents/practices, through which their preferences, beliefs, and/or norms are conveyed to students consciously or subconsciously.

The hidden curriculum is hidden in the sense that it is not explicitly written in the formal guideline, but is not necessarily hidden from public view. For instance, school sports meets, school trips, and greetings while saying "Stand up. Bow. Sit down." before/after class are well-known practices that are not explicitly written in the guideline,[4] but almost all public schools engage in these practices and everyone knows them. In contrast to such nationwide-employed practices, there are several region- or generation-specific informal practices. For instance, elementary schools in western Japan tend to provide anti-discrimination education (*Dowa Kyoiku*), have school assemblies on the atomic bomb

[3] Private schools as well as public schools are supposed to follow the guideline, but it is more strictly applied to public schools.

[4] School sports meets are sports festivals held at school in which pupils are separated into two teams (typically, red and white teams) and compete in several athletic sports. School trips are multi-day tours in which sixth-grade children participate to broaden their knowledge. Greetings before/after class are a sequence of actions of pupils such as standing up, bowing, and sitting down before and after class to show their respect for teachers.

day (August 6 or 8), or go to Hiroshima and Nagasaki (cities on which the atomic bombs were dropped) on school trips. Besides these practices, there are several region- or generation-specific informal practices, as listed in the first column of Table 1. In our original survey, as explained in the next subsection, we investigated peoples' experience of these 17 informal practices listed in the table.

Note that, in this paper, we focus on these region-/generation-specific informal practices, not on nationwide practices, because it is impossible to identify the effects of a variable that does not vary. Of course, this is just a practical issue and does not mean that such nationwide practices are of no importance. Although it is beyond the scope of this paper, a cross-country analysis may provide interesting insights, enabling us to investigate differences in national character or culture.

[Table 1]

3. Data

To investigate peoples' experiences of school education and their socio-economic preferences, we conducted an online survey in October 2012. More specifically, the survey was conducted by a Japanese market research company, MyVoice communications Inc., under the direction of the authors. MyVoice communications started undertaking Internet surveys in 1998 and had more than one million registered survey panelists as of November 2013.[5] Given the size of our research budget, we set the target number of respondents at 4,500. Then, considering average response rates, the survey company sent invitation emails for the survey to 14,628 survey panellists. To ensure sufficient variations among respondents' past educational

[5] MyVoice communications has a rigorous data quality control system to obtain highly reliable data. For instance, all registrants are checked strictly by examining their registration information, and about one-fourth of new registrants are eliminated beforehand due to inconsistent characteristics or double registration. In addition, the survey panelists are also regularly monitored, and the number of surveys in which one panelist can participate is also controlled (average frequency in one year is about 13).

experiences, we employed quota-sampling based on age, sex, and region (five age categories, two sexes, and nine regions),[6] and finally, we obtained 4,709 survey responses.

Table 2 reports sample features such as marital status and education level. The table also presents the same information calculated from national representative data for comparison (Panel B). As can be seen from the table, respondents in our survey are more likely to have a college degree (or greater) than the respondents of the *Labor Force Survey*. This is because our survey was conducted through the Internet and highly educated people have a high tendency to use the Web frequently. In particular, elderly cohorts seem to be biased more in terms of education level.

In the empirical analysis, of these 4,709 respondents, 894 individuals aged over 60 are excluded. This is partly due to the sample bias concern mentioned above, but is mainly due to their educational background. Individuals over 60 years old were born before, during, or soon after the war, and the Japanese education system changed significantly during the post-war occupation by the Allied Powers (1945-1952). Thus, the sample used in the analysis consists of males and females aged between 20 and 59, with a size of 3,815.

[Table 2]

Regarding experience of school education, as already shown in Table 1, the respondents were asked whether they had experience of 17 educational contents and practices. These contents/practices, shown in the table, are considered to reflect teachers' attitudes and values, namely the hidden curriculum, and have been employed in some regions (or for a period of time) but not in other regions (or for the entire period).

4. Empirical Framework

[6] Nine regions consist of Hokkaido, Tohoku, Kanto, Hokuriku, Chubu, Kinki, Chugoku, Sikoku, and Kyushu.

4.1. Empirical Specification

In this paper, we try to quantify the impacts of the hidden curriculum of elementary school education (HC) on the subsequent formation of socio-economic preferences ($Pref$) by estimating the following equation:

(1) $$Pref_i = \alpha + HC_i\boldsymbol{\beta} + X_i\boldsymbol{\gamma} + \varepsilon_i,$$

where i indexes individuals, X_i is a vector of controls (individual, household, and educational characteristics), ε_i is a random error, and α, $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$ are parameters to be estimated.

The outcomes of our interest ($Pref_i$) are social preferences such as altruism, beliefs on cooperation and trust, and reciprocity. These variables range from one to five, based on respondents' ratings of each statement as shown in Table 3.

[Table 3]

The hidden curriculum (HC_i), the main variable of interest in this paper, is literally unobservable. Thus, we take an approach to extracting factors composing the hidden curriculum. Table 4 reports rotated factor loadings obtained by the factor analysis using the principle component method with an orthogonal Varimax rotation. Five factors are retained in consideration of the Kaiser criterion and the scree test.

[Table 4]

The first factor has large loadings for "No display of the national flag" and on "No singing of the national anthem." These practices are thought to be based on reflections of the last world war and to be associated with leftist political thoughts such as anti-war and anti-nationalism. "Teachers' strike" and "Peace rally according to teachers' direction" are also

associated with leftish thoughts. Thus, the first factor is referred to as “Leftish political thought.” The second factor is strongly related to “Reading before class,” “Emergency drill on September 1,” and “Group learning.” We call this factor “Participation and cooperation.” The third factor is referred to as “Anti-competition,” because its factor loadings are large for “No footrace” and on “No finishing order.” The fourth factor is related to “Statue of hard work,” “Kid’s bank,” “Kolkhoz and sovkhoz,” and “Scale evaluation.” Because these educational contents and practices aim to teach the importance of industriousness, we call the fourth factor “Hard work & effort.” The final factor is strongly related to “School assembly on atomic bomb day,” “Anti-discrimination education,” and “School trip to Hiroshima and Nagasaki,” and is referred to as “Human rights & peace.” Thus, we use these five factors as proxies of the hidden curriculum.

Figure 1 is a map of average factor scores in Japanese prefectures. As can been seen from the figure, our proxies for the hidden curriculum (factor scores) vary widely among prefectures, implying that different prefectures employ different informal educational contents/practices. We also observe large generational differences for some factors, although we do not report generation-by-generation maps due to space constraints. For instance, Factor 3 (“hard-work & efforts”) varies from generation to generation, while there is little variation among prefectures: as the age of a generation decreases, factor scores for “hard-work & efforts” decrease. On the other hand, average factor scores for Factors 2 (“participation & cooperation”) and 5 (“anti-competition”) are relatively large among younger generations. This implies that a nationwide shift of educational contents/practices occurs from “hard-work & efforts” to “participation & cooperation” and “anti-competition.”

[Figure 1]

Regarding other controls X_i, guided by empirical literature, we employ individual characteristics (five-year birth cohort dummies, education dummies, female dummy, interactions between five-year birth cohort and education dummies, marital status dummies, income category dummies, household size, dummies for current place of residence), family backgrounds (parents' education dummies, number of books at home, dummies for living with grandparents, number of siblings at the age of 15), and school and school district characteristics (class size, dummy for experience with classroom chaos and teachers' active intervention with bullying, dummy for having elementary school classmates who went to a national university or medical school, and number of high schools that can be chosen in a school district).

4.2. Identification Issues

A key source of variations to identify the effects of the hidden curriculum stems from the fact that informal educational practices that students experience at public elementary school are exogenous to them. This is mainly due to the following two reasons.

First, in Japan, it is believed that educational contents/practices provided by public schools are uniform because all public schools are regulated by the same curriculum guideline. In reality, however, there are several informal educational contents/practices that vary widely from place to place as we saw in Section 2.1. At the same time, informal contents/practices are similar among neighboring schools. This might be attributable to the Japanese educational administration system, in which the educational administration is operated on a prefectural basis in principle,[7] and all school teachers are transferred to a school within a certain region of a prefecture. Thus, informal educational contents/practices

[7] All public schools in Japan are operated at a city/town/village level and are supervised by Education Boards (*kyouiku iinkai*). Education Boards are organized at two levels (prefecture and city/town/village), and prefectural Education Boards have the final word on the personnel affairs (recruitment, transfer, promotion, and dismissal) of all public school teachers in the prefecture. The only exceptions are 12 major (government-decreed) cities, where city Education Boards have authority over personnel issues.

in neighboring schools become similar. In fact, a homogeneous hidden curriculum within prefectures is confirmed by a simple test (the results are reported later). This implies that parents have great difficulty recognizing the fact that educational contents/practices vary from school to school.

Second, parents generally have no school choice over elementary education in Japan. This is due to the school district system (*gakku sei*) and the existence of few private elementary schools. Under the school district system, all school-age children can enter a public school (without taking an entrance examination), but each school district has only one public school and children have to go to the only school in their school district. Moreover, competition based on entrance examinations generally starts from high school. While the percentage of public schools is about 74% in the case of high schools, 99% of elementary schools are publicly operated.[8] As a consequence, it is unlikely that parents choose elementary schools based on informal educational contents/practices (hidden curriculum). Therefore, we can avoid a potential bias due to a self-sorting problem (reverse causality). This is also one of the reasons why we focus on elementary school education in Japan.

However, it is not beyond the realm of possibility that our identification framework fails. One major concern is the issue of cognitive dissonance. When people hold two conflicting cognitions, they might distort one to mitigate the dissonance from the other. In other words, there is a possibility that current preferences distort memories of the past. This potentially creates another reverse causality problem, which is a common pitfall when using subjective data.

To check this possibility, we conduct a simple test. Given that the formation of preferences is strongly affected by experience and environment, it is expected that those who migrated from their places of origin are more likely to change their preferences than those who stayed at their places of origin. This being true and there being the issue of cognitive

[8] At the stage of high school, students can choose public schools in their neighboring districts and public schools have an entrance examination.

dissonance, answers on past school experience might differ between respondents with a migration history and those without such experience. Using the two-level nested analysis of variance (ANOVA), we compare factor scores obtained with the factor analysis between migrators and non-migrators within prefectures (Table 5).

[Table 5]

The table shows that, for all five factors, the between-groups (prefectures) variation in column 1 is always larger than the between-subgroups (migrators/non-migrators) variation in column 2, and *F* statistic indicates rejection of the null that there are no differences among factor scores between prefectures. In contrast, the between-subgroups variation in column 2 is very close to the within-subgroup variation in column 3, indicating that there is no difference in factor scores between migrants and non-migrants within prefectures. These results have two important implications. First, the hidden curriculum seems to differ greatly from prefecture to prefecture, but not so much within prefectures, as implied previously. Second, there is no difference in factor scores between those with a migration history and those without a migration history. This implies that memory distortion due to cognitive dissonance is less likely.

Another concern with our identification framework is whether unobserved heterogeneity in school education among prefectures may confound the effects of the hidden curriculum. However, focusing on *public* schools gives a big advantage on this point, too. As already explained, in Japan, the contents/practices of school education are stipulated in the formal (not hidden) curriculum, and the curriculum is based on the formal curriculum guideline provided by the government. Therefore, we can say that the *formal* curriculum is almost homogeneous among all public schools. To be sure to eliminate possible unobserved heterogeneity among prefectures, we additionally control dummies for the location

(prefecture) of the elementary schools where respondents were educated (at the age of 12)[9], as well as dummies for the current place of residence.

5. Empirical Results

5.1. Effect on Preferences for Social Relationships

We start by estimating the basic specification in equation (1). Empirical variables used in the analysis are summarized in Table 6 and the estimation results are reported in Table 7. All estimations are implemented with OLS controlling individual characteristics, family backgrounds, and school (school district) characteristics, and prefecture dummies (current and at the age of 12). In addition, we adjust the sampling weight to make our observations proportional to the Japanese population distribution.

[Table 6]

[Table 7]

From the results in Table 7, we see sharp contrasts between "participation & cooperation" (row 2) and "anti-competition" (row 5). Those who experienced participatory/cooperative learning practices are more likely to favor altruistic behavior (column 1), cooperation with others (columns 2 and 3), and reciprocal behavior (column 6). An increase by one standard deviation in "participation & cooperation" increases the scores of "altruism" by 0.085 (11.0% of the standard deviation), "cooperation: outcome" by 0.042 (5.8%), "cooperation: satisfaction" by 0.061 (7.6%), and "positive reciprocity" by 0.039 (5.4%), respectively. Regarding beliefs in cooperation, our results are similar to those

[9] Unfortunately, our dataset does not contain information about experiences of changing schools before the age of 12. In this sense, the location at the age of 12 is not always exactly the place where respondents were mainly educated.

obtained in Algan et al. (2013), who found that group learning increases students' beliefs in cooperation.

On the other hand, those who experienced education implementing anti-competitive practices are less likely to favor altruistic behavior (column 1), cooperation with others (column 2), and reciprocal behavior (columns 6 and 7). Our estimates suggest that an increase by one standard deviation in "anti-competition" decreases scores of "altruism" by 0.035 (4.5% of the standard deviation), "cooperation: outcome" by 0.041 (5.6%), and "positive reciprocity" by 0.044 (6.0%), respectively. More interestingly, the sign of the coefficient of "anti-cooperation" differs between the case of positive reciprocity (column 6) and negative reciprocity (column 7), suggesting that those who experienced education implementing anti-competitive practices prefer not to repay an obligation, but to make a countercharge.

Thus, our results show that the experience of participatory/cooperative learning is associated with positive social preferences, while anti-competitive education is associated with negative social preferences. These contrasts between the two also can be seen in the result for "national pride" (the last column). The former is positively associated with national pride, while the latter is negatively associated with it.[10]

Regarding the other factors of the hidden curriculum, the coefficient estimates are statistically insignificant except for the effects of "human rights & peace" on "competition" (row 3 and column 4) and the effects of "leftish political thought" on "negative reciprocity" (row 1 and column 7). In particular, "hard work & effort" (row 3) has no influence on the formation of these preferences and beliefs. This may not imply that "hard work & effort" does not affect preference formation and belief. Instead, it might be a result of the weak identification power of the variable because education emphasizing on "hard work & effort" is common everywhere in Japan as can be seen in Panel C of Figure 1.

[10] We also see contrasts between "participation & cooperation" and "anti-competition" in their impacts on other social preferences. See Table A2 in Appendix I.

5.2. Robustness Checks and Discussion

To check further the possibility that the coefficients of the hidden curriculum confound other mechanisms, we run several estimations employing different specifications. First, in addition to the explanatory variables already controlled, the versions of the School Curriculum Guideline are controlled. Since the end of the last war, the ministry has revised the guideline nine times (in 1947, 1951, 1956, 1961, 1971, 1980, 1992, 2002, and 2011). Revisions to the guideline might be correlated with the hidden curriculum, and omitting a version might cause the coefficient estimates to be biased. So, we try several specifications including dummies for the version, or years under a version of the guideline (and their interactions with prefecture dummies at the age of 12). Estimation results of the specification with dummy variables are presented in Panel B of Table 8.[11] The results show that, in most cases, coefficient estimates slightly increase in their magnitude by controlling dummies for the version of guideline and their interactions with prefecture dummies. Thus, unobserved heterogeneity among generations and prefectures is less likely to influence our estimates.

[Table 8]

Second, as we saw in Table 1, not a few respondents answered "do not remember" to several informal educational contents/practices. If forgetting is intentional and occurs in a non-random manner due to the issue of cognitive dissonance, there is a possibility that our proxies for the hidden curriculum are correlated with unobserved individual heterogeneity. Therefore, we estimate several models including the percentage of answers "do not remember" to the 17 questions regarding educational contents/practices, the number of "do not remember" answers, or 17 dummy variables that take unity if the answer is "do not remember" and zero

[11] For reasons of space, the table includes only the results for the impacts of "participation & cooperation" and "anti-competition" on altruism (column 1), beliefs in cooperation (columns 2 and 3), and reciprocity (columns 4 and 5). This is because the results in Table 7 show striking contrasts between two factors regarding these preferences and beliefs.

otherwise. Panel C of Table 7 shows estimation results based on the specification with the percentage of answers “do not remember” to the 17 questions. Again we see that controlling the variable does not affect our main findings: the magnitude and statistical significance of coefficient estimates are almost unchanged.

Third, to eliminate any influence of unobserved heterogeneity among prefectures and birth cohorts, we estimate the model including interaction terms between prefecture dummies (at the age of 12) and five-year birth cohort dummies (Panel D of Table 8). The results show that inclusion of the interaction terms increases the magnitude of the coefficient estimates slightly in most cases, but does not change our main findings. Thus, our results are less likely to be influenced by such unobserved heterogeneity.

Finally, we would like to mention the possibility of omitted variable bias due to unobserved teacher characteristics. One may doubt that unobserved teacher characteristics affect the selection of informal educational contents/practices (and consequently preference formation), and that our estimates confound the influence of such teachers’ personal qualities. Fundamentally, we do not exclude the possibility of such influences through teachers because the hidden curriculum, as we explained in Section 2, is considered to be based on preferences, beliefs, and/or norms of teachers or a school/community. In this sense, our purpose is to quantify the total, in other words, both direct and indirect effects of the hidden curriculum on preference formation. At the same time, however, we believe that, in our context, it is unlikely that our estimates confound the influence of unobserved teacher characteristics for the following reasons.

First, our educational contests/practices used in the analysis (as listed in Table 1) cannot be determined at the class level, but at the school level. Moreover, teachers (and students) cannot chose the schools in which they work (in which to enroll) as mentioned in Section 3.2. Hence, informal education contents/practices at schools are expected to be independent of teachers’ personal characteristics. In fact, Table 5 suggests that our proxies

for the hidden curriculum differ from prefecture to prefecture: within-prefecture variations are much smaller than between-prefectures variations. This is mainly due to the educational administration system in Japan, implying that our informal contents/practices are determined at some community level.

Furthermore, even if unobserved teacher qualities still exist, our estimations are made by including several controls that capture the quality of a teacher or a school (school district) such as class size, dummies for experience with classroom chaos and teachers' active intervention with bullying, dummy for having elementary school classmates who went to a national university or medical school, and the number of high schools that can be chosen in a school district. In addition, we control current individual income level, which may partially capture the quality of education. Thus, we conclude that our estimates do not suffer from unobserved teacher characteristics.

6. Conclusion

In this paper, we examine the role of elementary school education in the formation of social preferences. In the analysis, we extract proxy factors composing the hidden curriculum and investigate their impacts on the formation of social preferences. Our main findings are summarized as follows. First, educational contents/practices at public elementary school vary greatly from place to place. While it has been believed that public elementary schools in Japan provide universal education with homogeneous educational contents/practices, different schools employ different (hidden) curricula.

Second, the hidden curriculum has significant impacts on the subsequent formation of social preferences. In particular, participatory and cooperative learning is related positively to a wide variety of social preferences: those who have experienced participatory and cooperative learning practices are also more likely to be altruistic, cooperative with others, reciprocal, and proud of the nationality. On the other hand, educational practices emphasizing

anti-competition are associated negatively with social preferences, contrary to participatory and cooperative learning practices: those who educated with anti-competitive practices are more likely to be non-altruistic, uncooperative with others, vengeful, and antipatriotic.

On the whole, our results indicate that elementary school education plays an important role in the preference formation of members of society. Considering the fact that parents basically cannot choose their children's schools at elementary education and that informal educational contents/practices also differ between parents' and children's generations, preference formation through elementary education found in this paper is distinct from the mechanism through family (from parents to children in a family). Thus, this paper provides evidence of the oblique/horizontal socialization mechanism in line with Algan et al. (2013). Moreover, it is also worth noting that our findings suggest prolonged influences of elementary schooling on preference formation. This indicates that education can shape the future of society through preference formation, not just through human capital formation. In this regard, however, this paper is silent on the role of formal (operated nationwide) educational contents/practices due to data limitation. To better understanding the role of education in cultural transmission, further studies need to be accumulated. One direction would be to explore the causal relationship between cross-national heterogeneity in education and cultural diversity using a cross-national dataset.

Appendix I: Additional Analysis on the Effects of the Hidden Curriculum

In this appendix, we present complemental estimation results on the impacts of the hidden curriculum. First, Table A1 reports the results of the full specification discussed in Section 4.2. Details are omitted here, but a comparison with the results in Table 7 indicates that our main findings are unchanged. Thus, our estimates are not so sensitive to the model specification.

[Table A1]

Second, we present the estimation results for other social preferences such as tastes for government economic policies and for market institutions. Table A2 reports the coefficients of interest, based on the specification in equation (1). We control the same variables as in Table A1. As can be seen from the table, the hidden curriculum has substantial impacts on the formation of economic preferences. Columns 1 to 5 report the estimated impacts on preferences for government redistributive policy. Here again, we see a contrast between "participation & cooperation" and "anti-competition." In cases where the coefficient estimates on "participation & cooperation" are positive, the coefficient estimations of "anti-competition" are negative, and vice versa. The results show that those who experienced participatory/cooperative learning ("participation & cooperation") are more likely to approve of redistributive policy: they endorse government policies to reduce income inequality (column 2), to impose heavier taxes on big companies and the rich (columns 3 and 4). In contrast, those who experienced anti-competitive education ("anti-competition") are more likely to oppose government redistribution policies (column 1) and social security (column 5).

[Table A2]

Columns 6 to 8 of Table A2 present the estimation results on the impacts of the hidden curriculum on market institutions. The results show that those who experienced education emphasizing "leftish political thoughts" are more likely to oppose the market economy (column 7) and to approve of labor unions (column 8), and those who experienced anti-competitive education ("anti-competition") are more likely to oppose both the market economy (column 7) and labor unions (column 8).

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Tables

Table 1: Informal Educational Contents and Practices

Contents/Practices	Statement in the questionnaire	Yes	Do not remember
Reading before class	There was time for reading before class.	0.272	0.189
Statue of hard work	There was a statue of Kinjiro Ninomiya reading a book while walking and carrying firewood on his back.	0.382	0.082
School assembly on atomic bomb day	August 6 or 9 during summer vacation was a school day.[a)]	0.245	0.427
Segmenting by gender	Student ID numbers in a class were according to gender.	0.619	0.165
Teachers' strike	Sometimes, there was no classroom lesson due to a teachers' strike	0.118	0.149
No display of national flag	There was no display of the national flag at some entrance/graduation ceremonies.	0.065	0.252
Kids' bank	School had a kids' bank (*Kodomo Ginko*).[b)]	0.108	0.113
Emergency drill on September 1	School conducted an emergency drill on September 1.[c)]	0.304	0.468
Group learning	There was a task in which students worked together as a group.	0.754	0.126
Antidiscrimination education	School conducted antidiscrimination education (*Dowa Kyoiku*).[d)]	0.339	0.243
No singing of national anthem	There was no singing of the national anthem at some entrance/graduation ceremonies.	0.089	0.165
Kolkhoz and sovkhoz	Studied Kolkhoz and Sovkhoz in a class.[e)]	0.265	0.250
School trip to Hiroshima and Nagasaki	Visited Hiroshima or Nagasaki on a school trip.	0.381	0.051
Scale evaluation	Evaluation of educational achievement was based on a several-point scale, e.g., on a scale of one to five.	0.715	0.059
Target-based evaluation	There were specific targets for achievement in each subjects, and grades were evaluated on the basis of "achieved" or "not."	0.437	0.198
No footraces	There were no footraces at school sports meets.	0.060	0.041
No finishing order	There were footraces at school sports meet, but teachers did not rank the finishing order.	0.020	0.054

Note: a) August 6 and 9 are days marking the dropping of atomic bombs on Hiroshima and Nagasaki. b) Kids' bank (*Kodomo Ginko*) is a bank for students in which bankers come to school regularly and students can save/withdraw money to/from their accounts. It was established by the Finance Ministry and Education Ministry directly after the war to have students learn the fundamental structure of the banking system. c) September 1 is the day on which the Kanto Dai-shinsai (the Great Kanto Earthquake) occurred in 1923. d) Antidiscrimination education (*Dowa Kyoiku*) provides opportunities for students to study discrimination against outcasts that dates back to the Edo era or before. e) Kolkhoz and Sovkhoz are collective farms of the Soviet era.

Table 2: Sample Characteristics

A. Our survey (2012)	Unmarried	Graduates / Post graduates
Total (aged 20 or more)	37.2%	47.5%
Aged between 20 and 24	94.5%	39.8%
Aged between 25 and 34	68.6%	55.3%
Aged between 35 and 44	37.4%	45.5%
Aged between 45 and 54	20.1%	45.6%
Aged between 55 and 64	9.3%	45.9%
Aged 65 or more	4.0%	37.7%
B. Labor Force Survey (2012)	Unmarried	Graduates / Post graduates
Total (aged 15 or more)	25.8%	20.9%
Aged between 15 and 24	96.5%	21.8%
Aged between 25 and 34	52.0%	34.4%
Aged between 35 and 44	22.8%	26.7%
Aged between 45 and 54	13.7%	25.8%
Aged between 55 and 64	7.9%	19.3%
Aged 65 or more	3.3%	9.0%

Table 3: Definitions of Dependent Variables

Variable	Statement in the questionnaire	Answer
Altruism	I feel happy when I do a good deed that I think is beneficial for others (such as picking up trash in a park).	1 (strongly disagree) to 5 (strongly agree)
Cooperation: outcome	Working as a group results in greater achievements than working individually.	
Cooperation: satisfaction	I am more satisfied when I achieve a goal by cooperating with others than only by myself.	
Competition	I enjoy competing with others.	
Trust	In general, you can trust most people.	
Positive reciprocity	Average of answers to the following three questions: (1) If someone does me a favor, I am prepared to return it; (2) I go out of my way to help somebody who has been kind to me before; and, (3) I am ready to undergo personal costs to help somebody who helped me before.	
Negative reciprocity	Average of answers to the following three questions: (1) If somebody offends me, I will offend him/her back; (2) If somebody puts me in a difficult position, I will do the same to him/her; and (3) If I suffer a serious wrong, I will take revenge as soon as possible, no matter what the cost.	
National pride	I am proud of being Japanese.	

Note: Regarding the definitions and measurements of positive and negative reciprocity, we follow Dohmen et al. (2009).

Table 4: Results of Factor Analysis

	Factor 1: Leftish political thought	Factor 2: Participation & cooperation	Factor 3: Hard-work & effort	Factor 4: Human rights & peace	Factor 5: Anti-competition
Reading before class	-0.015	0.603	-0.143	0.062	0.141
Statue of hard work	-0.188	0.073	0.410	0.231	0.114
School assembly on atomic bomb day	0.136	0.187	0.235	0.473	0.056
Segmenting by gender	0.060	0.197	0.390	0.248	-0.285
Teachers' strike	0.396	0.179	0.292	-0.020	0.086
No display of national flag	0.851	0.030	0.021	0.057	0.055
Kodomo Ginko (kids' bank)	-0.031	0.108	0.516	0.031	0.255
Emergency drill on September 1	0.049	0.584	0.066	-0.147	-0.031
Group learning	-0.002	0.628	0.112	0.074	-0.158
Antidiscrimination education	0.110	0.009	0.014	0.728	0.009
No singing of national anthem	0.834	-0.028	0.003	0.045	0.029
Kolkhoz and sovkhoz	0.106	-0.114	0.646	-0.051	-0.004
School trip to Hiroshima and Nagasaki	0.006	-0.047	-0.069	0.713	0.061
Scale evaluation	0.021	-0.024	0.536	-0.065	-0.065
Target-based evaluation	0.023	0.531	-0.080	0.013	0.162
No footraces	-0.001	-0.008	-0.007	0.047	0.750
No finishing order	0.140	0.032	0.051	0.033	0.738

Note: Reported figures are rotated factor loadings estimated by the factor analysis using the principle component method with an orthogonal Varimax rotation. The shaded cells indicate that the loading is greater than or equal to 0.3.

Table 5: Checks on Heterogeneity in Hidden Curriculum within/between Prefectures

		(1) Between groups	(2) Between subgroups within groups	(3) Within subgroups	(4) Total
	DoF	46	47	3,589	3,682
Factor 1:	MS	4.61	0.67	0.91	0.98
Leftish political thought	*F*-stat.	6.84***	0.74		
Factor 2:	MS	3.78	1.19	0.94	0.98
Participation & cooperation	*F*-stat.	3.17***	1.27		
Factor 3:	MS	1.82	0.88	1.00	1.03
Hard work & effort	*F*-stat.	2.05***	0.88		
Factor 4:	MS	23.15	0.58	0.61	1.04
Human rights & peace	*F*-stat.	39.60***	0.96		
Factor 5:	MS	1.88	0.92	0.99	1.00
Anti-competition	*F*-stat.	2.06***	0.93		

Note: "Group" is defined here as prefecture (at the age of 12), and "subgroup" is defined on the basis of respondents' migration history: 0=current prefecture differs from the prefecture at the age of 12, 1=otherwise. "Dof" stands for degree of freedom, "MS" stands for mean square, and "*F* stat." is *F* statistic. *F* statistic in column 1 is for testing the null that mean squares in columns 1 and 2 are equal, and that in column 2 is for testing the null that mean squares in columns 2 and 3 are equal.

Table 6: Summary of Statistics on Empirical Variables

Variable	NOBs	Mean	Std. Dev.	Min	Max
Altruism	3,621	3.581	0.768	1	5
Cooperation - outcome	3,621	3.421	0.728	1	5
Cooperation - satisfaction	3,621	3.414	0.805	1	5
Trust	3,621	2.952	0.868	1	5
Competition	3,621	2.922	0.870	1	5
Positive reciprocity	3,621	3.745	0.592	1	5
Negative reciprocity	3,621	2.723	0.774	1	5
National pride	3,621	3.690	0.883	1	5
F1: leftish political thought	3,621	-0.024	0.987	-1.221	4.556
F2: Participation & cooperation	3,621	-0.036	0.985	-2.162	2.585
F3: Anti-competition	3,621	0.011	1.013	-2.189	3.389
F4: Industriousness & effort	3,621	0.094	1.021	-1.915	2.759
F5: Human rights & peace	3,621	0.033	0.989	-1.086	7.292
Age a)	3,621	39.534	10.881	20	59
Schooling years b)	3,621	14.370	2.123	9	21
Female dummy	3,621	0.501	0.500	0	1
Marital Status dummies					
Divorced	3,621	0.042			
Bereaved	3,621	0.004			
Unmarried	3,621	0.371			
Income (million yen)	3,419	273.062	293.118	0	1500
Household size	3,389	2.867	1.150	1	5
Father's schooling years c)	3,089	12.387	2.703	9	21
Mother's schooling years d)	3,107	11.799	2.032	9	21
# of books at home					
50 to 99 books	3,621	0.122			
10 to 19 books	3,621	0.407			
1 to 9 books	3,621	0.152			
No books	3,621	0.019			
Do not remember	3,621	0.138			
Living together with grandparents					
Less than a year	3,621	0.027			
Less than 5 years	3,621	0.066			
Less than 10 years	3,621	0.058			
More than 10 years	3,621	0.284			
# of elder siblings	3,621	0.601	0.795	0	6
# of younger siblings	3,621	0.742	0.769	0	7
Class size	3,621	36.043	8.094	1	80
# of high schools					
2 to 4 schools	3,621	0.238			

5 to 9 schools	3,621	0.267			
More than 10 schools	3,621	0.146			
Do not remember	3,621	0.225			
Class size	3,621	36.043	8.094	1	80
Classmates who went on to university	3,621	0.451			
Classroom chaos	3,621	0.257			
Teachers' active intervention	3,621	0.263			
Percentage of "don't remember"	3,621	0.174	0.167	0	1

Table 7: Impacts of Hidden Curriculum on Preferences for Social Relationships

	(1)	(2)	(3)	(4)
Dependent variable:	Altruism	Cooperation: outcome	Cooperation: satisfaction	Competition
Leftish political thought	-0.007	-0.011	-0.013	-0.004
	(0.016)	(0.019)	(0.020)	(0.020)
Participation & cooperation	0.086	0.043	0.062	0.022
	(0.021)***	(0.020)**	(0.021)***	(0.021)
Hard work & effort	0.016	-0.012	-0.027	-0.009
	(0.019)	(0.016)	(0.019)	(0.019)
Human rights & peace	0.000	0.020	0.036	0.046
	(0.019)	(0.021)	(0.023)	(0.024)*
Anti-competition	-0.035	-0.041	-0.019	-0.024
	(0.018)**	(0.016)***	(0.019)	(0.019)
Observations	3,621	3,621	3,621	3,621
Adjusted R-squared	0.136	0.145	0.125	0.131

	(5)	(6)	(7)	(8)
Dependent variable:	Trust	Positive reciprocity	Negative reciprocity	National pride
Leftish political thought	-0.011	0.005	-0.038	-0.022
	(0.021)	(0.016)	(0.021)*	(0.022)
Participation & cooperation	-0.008	0.040	0.014	0.065
	(0.028)	(0.019)**	(0.019)	(0.026)**
Hard work & effort	0.030	0.014	0.017	0.019
	(0.022)	(0.015)	(0.018)	(0.023)
Human rights & peace	0.017	0.019	-0.013	0.033
	(0.021)	(0.016)	(0.024)	(0.021)
Anti-competition	0.012	-0.044	0.045	-0.039
	(0.020)	(0.016)***	(0.017)***	(0.021)*
Observations	3,621	3,621	3,621	3,621
Adjusted R-squared	0.150	0.188	0.129	0.169

Note: All estimations are implemented by OLS with other controls such as five-year birth cohort dummies, education dummies, female dummy, interactions between birth cohort and education dummies, marital status dummies, income category dummies, household size, parents' education dummies, number of books at home at school age, dummies for living with grandparents, number of siblings at the age of 15, class size at elementary school, dummies for experience with classroom chaos and teachers' active intervention with bullying, dummy for having elementary school classmates who went to a national university or medical school, number of high schools that can be chosen in a school district, and prefecture dummies (current and at the age of 12). In addition, we adjust the sampling weight to make our observations proportional to the Japanese population distribution. Numbers in parentheses are Huber-White robust standard errors clustered at ten-year age cohort, sex, and prefecture level.

Table 8: Robustness checks on Impacts of Hidden Curriculum

Dependent variable:	(1) Altruism	(2) Cooperation: outcome	(3) Cooperation: satisfaction	(4) Positive reciprocity	(5) Negative reciprocity
A) Result in Table 7					
Participation & cooperation	0.086	0.043	0.062	0.040	0.014
	(0.021)***	(0.020)**	(0.021)***	(0.019)**	(0.019)
Anti-competition	-0.035	-0.041	-0.019	-0.044	0.045
	(0.018)**	(0.016)***	(0.019)	(0.016)***	(0.017)***
B) Eliminating unobserved heterogeneity in the formal curriculum					
Participation & cooperation	0.087	0.044	0.063	0.040	0.014
	(0.021)***	(0.020)**	(0.021)***	(0.019)**	(0.019)
Anti-competition	-0.036	-0.042	-0.020	-0.044	0.046
	(0.018)**	(0.016)***	(0.020)	(0.016)***	(0.017)***
C) Partialling out possible effects of cognitive disorder					
Participation & cooperation	0.084	0.044	0.067	0.038	0.012
	(0.021)***	(0.021)**	(0.023)***	(0.020)*	(0.021)
Anti-competition	-0.036	-0.042	-0.020	-0.044	0.046
	(0.018)**	(0.016)***	(0.019)	(0.016)***	(0.017)***
D) Controlling unobserved heterogeneity among generations and prefectures					
Participation & cooperation	0.079	0.051	0.073	0.051	0.021
	(0.020)***	(0.020)**	(0.022)***	(0.019)***	(0.022)
Anti-competition	-0.034	-0.043	-0.020	-0.047	0.043
	(0.019)*	(0.017)**	(0.021)	(0.016)***	(0.018)**

Note: See the note in Table 7. In the estimations reported in Panel B, we include dummies for versions of curriculum guideline and interactions with birth-cohort dummies in addition to the explanatory variables already controlled in Table 6. In the estimations in Panel C, we include the percentage of answers “Don’t remember” to the 17 questions regarding educational contents/practices, in addition to the controls in the estimation in Panel B. In the estimations in Panel D, we include interaction terms between five-year birth cohort dummies and prefecture dummies (at the age of 12), in addition to the controls in the estimation in Panel C.

Table A1: Impacts of Hidden Curriculum on Social Preferences (Full Specification)

Dependent variable:	(1) Altruism	(2) Cooperation: outcome	(3) Cooperation: satisfaction	(4) Competition
Leftish political thought	0.005	0.003	-0.009	-0.015
	(0.017)	(0.019)	(0.020)	(0.022)
Participation & cooperation	0.079	0.051	0.073	0.009
	(0.020)***	(0.020)**	(0.022)***	(0.025)
Hard work & effort	0.008	-0.014	-0.023	-0.017
	(0.021)	(0.018)	(0.023)	(0.021)
Human rights & peace	0.009	0.013	0.026	0.054
	(0.023)	(0.022)	(0.027)	(0.027)**
Anti-competition	-0.034	-0.043	-0.020	-0.020
	(0.019)*	(0.017)**	(0.021)	(0.020)
Observations	3,621	3,621	3,621	3,621
Adjusted R-squared	0.136	0.145	0.125	0.131

	(5)	(6)	(7)	(8)
Dependent variable:	Trust	Positive reciprocity	Negative reciprocity	National pride
Leftish political thought	0.008	0.002	-0.034	-0.026
	(0.022)	(0.014)	(0.022)	(0.020)
Participation & cooperation	0.015	0.051	0.021	0.070
	(0.029)	(0.019)***	(0.022)	(0.026)***
Hard work & effort	0.039	0.019	0.025	-0.004
	(0.023)*	(0.016)	(0.020)	(0.023)
Human rights & peace	0.042	0.016	-0.006	0.033
	(0.024)*	(0.018)	(0.027)	(0.024)
Anti-competition	0.022	-0.047	0.043	-0.051
	(0.022)	(0.016)***	(0.018)**	(0.022)**
Observations	3,621	3,621	3,621	3,621
Adjusted R-squared	0.150	0.188	0.129	0.169

Note: All estimations are implemented by OLS with other controls included in the estimation in Panel D of Table 8.

Table A2: Impacts of Hidden Curriculum on Preferences for Government Policies and Market Institutions (Full Specification)

Dependent variable::	(1) Taking care of the poor	(2) Reducing income inequality	(3) Heavy taxes on big companies	(4) Heavy taxes on the rich
Leftish political thought	-0.025	0.022	-0.001	0.027
	(0.021)	(0.023)	(0.028)	(0.022)
Participation & cooperation	-0.016	0.046	0.064	0.051
	(0.023)	(0.024)*	(0.029)**	(0.026)**
Hard work & effort	0.018	-0.040	-0.001	-0.022
	(0.023)	(0.024)*	(0.024)	(0.024)
Human rights & peace	-0.021	0.010	0.020	0.049
	(0.023)	(0.028)	(0.031)	(0.029)*
Anti-competition	-0.049	-0.002	-0.027	-0.023
	(0.021)**	(0.021)	(0.022)	(0.024)
Observations	3,621	3,621	3,621	3,621
Adjusted R-squared	0.162	0.165	0.104	0.114

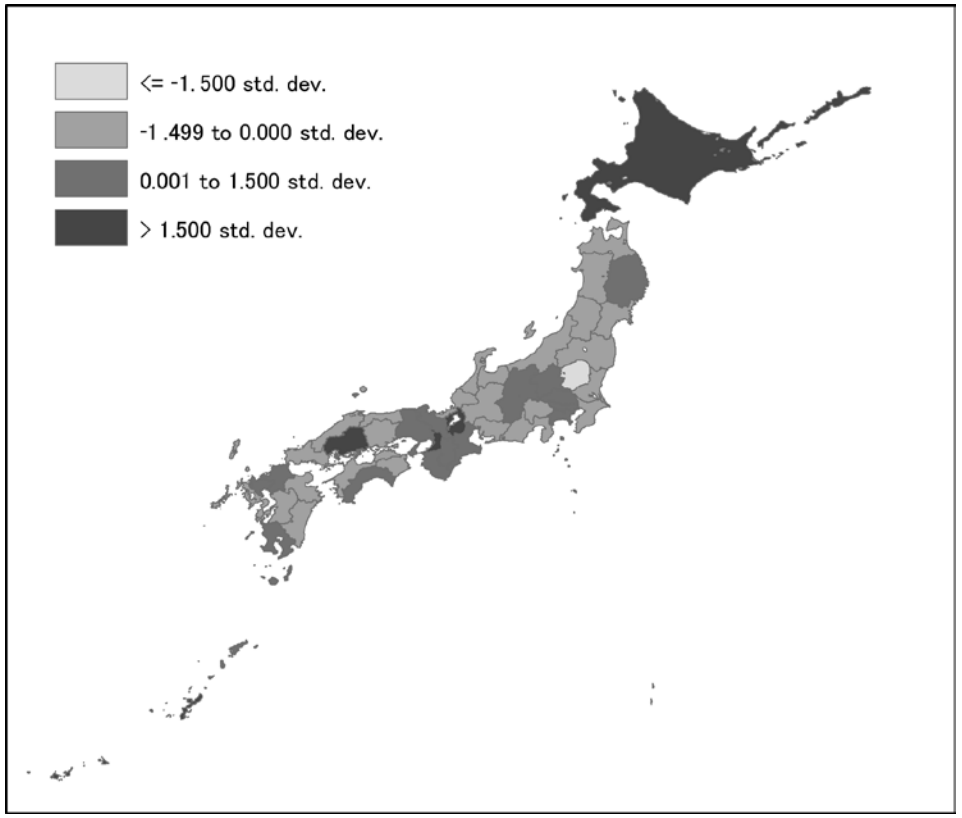
	Redistributive policy:	(6)	(7)	(8)
Dependent variable::	(5) Social security	Deregulation	Market economy	Labor union
Leftish political thought	0.030	-0.026	-0.051	0.073
	(0.025)	(0.024)	(0.026)**	(0.022)***
Participation & cooperation	0.024	0.035	0.009	0.008
	(0.024)	(0.022)	(0.022)	(0.027)
Hard work & effort	0.004	0.018	-0.014	-0.004
	(0.025)	(0.022)	(0.022)	(0.023)
Human rights & peace	-0.012	0.003	0.028	0.028
	(0.026)	(0.024)	(0.026)	(0.026)
Anti-competition	-0.079	0.012	-0.045	-0.038
	(0.020)***	(0.017)	(0.018)**	(0.020)*
Observations	3,621	3,621	3,621	3,621
Adjusted R-squared	0.128	0.159	0.139	0.101

Note: See the note to Table A1.

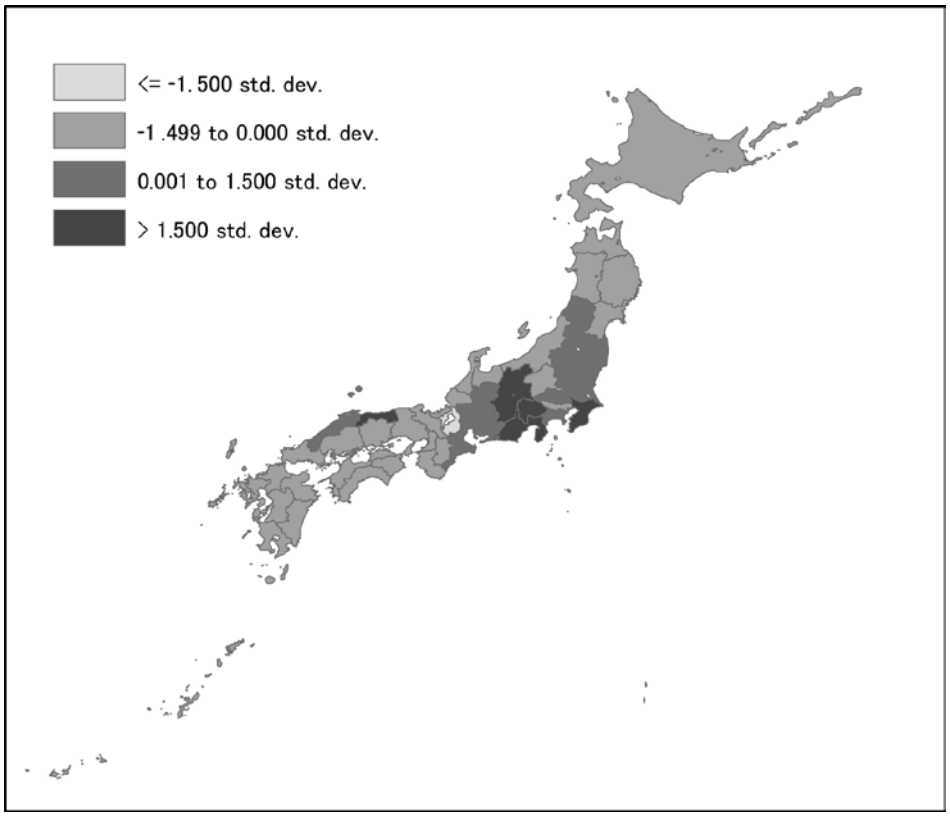
Figures

Figure 1:

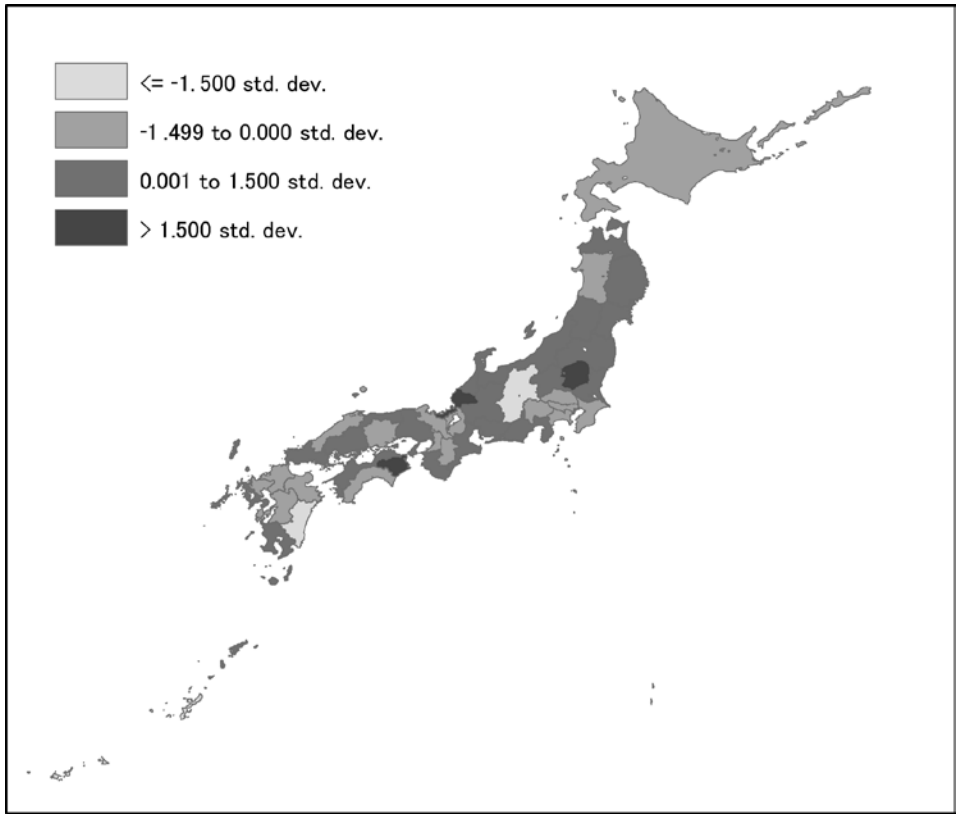
A) Leftist political thought



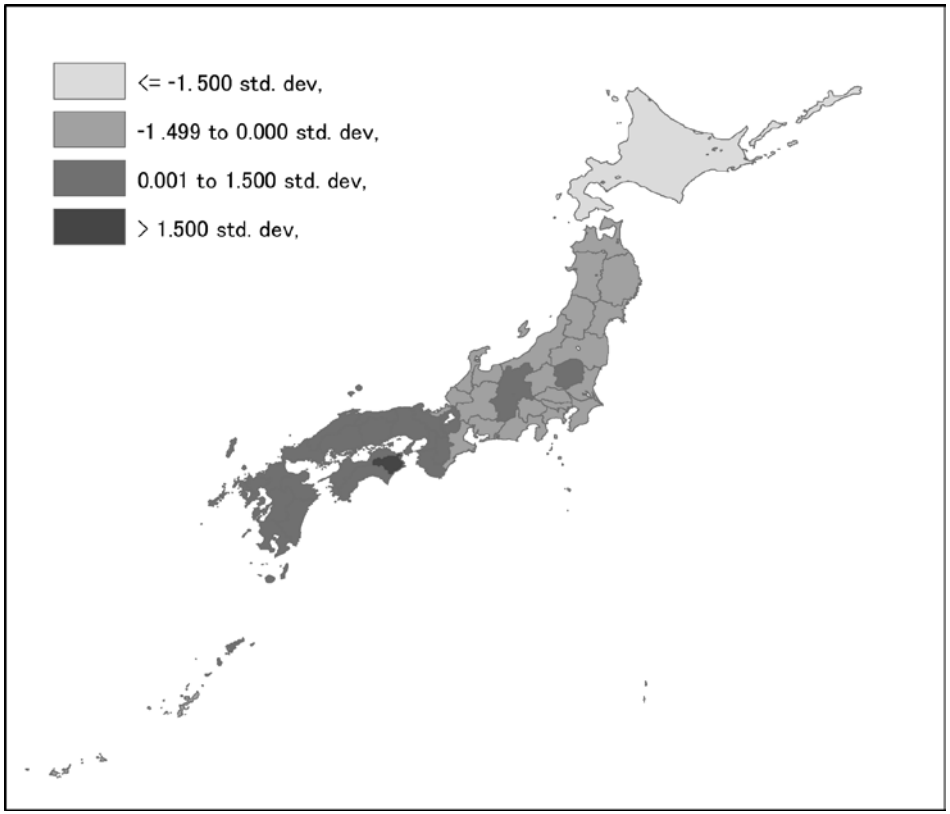
B) Participation & cooperation



C) Hard work & effort



D) Human rights & peace



E) Anti-competition