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Abstract

This paper attempts to ascertain the determinants of watching anime in Japan based on individual-level data from Japan. In particular, this study investigates how adults are influenced by the existence of their children. After controlling for individual characteristics, it was found that people are more likely to watch anime when they have children aged less than 12 years. Such an effect is larger for women than for men. This tendency is observed even when respondents are full-time workers. This implies that the externality coming from children results in parents watching anime. Furthermore, the externality is larger for women than men regardless of their time constraints.

JEL classification: D12, Z11, Z19
Keywords: Anime; Japan; Externality

1. Introduction

The animation industry has developed in tandem with economic globalization (Yoon and Malecki 2009). Anime, which is an abbreviation of the English word 'animation,' became popular in Japan and western countries in the 1990s with the export of animated films and videos (e.g., Napier 2000; Denison 2008; Lu 2008)[2]. "Japanese anime has held the number-one position in the world of animation for nearly two decades. Over 60% of the animated cartoons broadcast around the world are made in Japan." (JETRO 2005a, 2) Yoon and Malecki (2009, 244) describe Japanese anime from Studio Ghibli as screen production that focuses on artistic quality. Hayao Miyazaki is an animator who co-founded Studio Ghibli and is recognized as the most influential anime creator to date. For instance, one of his masterpieces, *Spirited Away*, was released in 2001 and has been seen by 23.5 million viewers, making it the most watched Japanese movie ever. In 2002, *Spirited Away* became the first anime feature film to win the Golden Bear award at the Berlin International Film Festival. The movie also won an Oscar for the best animated feature film at the Academy Awards. Furthermore, Miyazaki's other works such as *Howl's Moving Castle* (released in 2004) and *Princess Mononoke* (1997) are placed at number two and three in Japanese film history, respectively (JETRO 2005b). Regarding theater attendance, numbers have been growing since 2002 because of the increased number of screens at cinema complexes (JETRO 2005b)[3].

Japan's domestic anime market can be divided into two categories: television series and feature-length films. Sixty percent of television anime is broadcast after 6 p.m., mostly targeting preschoolers and other children during prime time (JETRO 2005a). In Japan, there is ordinarily a television in the living room where family members meet and interact with each other. Hence, when children watch anime on television, their parents inevitably also watch it. That is, the viewing habits of children result in their parents watching television even if parents would not choose to watch it themselves. This can be considered as a network externality between family members (Hoge et al. 1982; Calvo-Armengol and Jackson, 2009). In terms of

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[2] Takashi Murakami, an influential Japanese artist, has adopted anime-style characters in his art works, including paintings and plastic figures.

[3] There are a large number of works that examine the demand for cinema in the field of cultural economics (e.g., Cameron 1986; 1988; 1990; 1999; Fernández and Baños 1997; Cuadrado and Frasquet 1999; MacMillan and Smith 2001; Dewenter and Westermann 2005; Yamamura 2008; 2009).

feature-length films, as argued by Yamamura (2008), close ties with surrounding people seem to have a positive externality on cinema attendance. This is especially true in the case of anime, which is generally targeted at young children; a positive externality possibly exists within a household because young children are not able to buy movie tickets to anime themselves. Furthermore, primary schools and kindergartens generally prohibit that young children go to the cinema unless accompanied by their parents. As a consequence, if a child goes to the cinema, tickets for both the child and parents will be purchased. Therefore, film companies have an incentive to release movies targeted at young children to increase attendance through this externality. For example, since 1969, during spring, summer, and winter school holidays, the Toei film company holds its 'Toei Anime Festival.' During this festival, three or four anime films, targeted at young children, are jointly released. The festival enables the Toei film company to enjoy the externality, which leads to an increase in attendance. With respect to another form of anime, the Asahi Broadcasting Corporation and the Toei film company jointly produced Pretty Cure, shortened to PreCure. PreCure is an anime series targeted at younger girls featuring a girl with special powers. The PreCure series airs as part of TV Asahi's Sunday morning children's television block. The successful collaboration between the Asahi Broadcasting Corporation and the Toei film company has resulted in increased profits.

Some researchers have analyzed the comic market, which is closely related to animation (e.g., Belk 1987; Dewally and Ederington 2006; Wyburn and Roach 2012)[4]. However, little is known about the anime market in Japan, despite anime now leading the Japanese popular culture industry. Hence, it is worthwhile to look at the anime market in Japan in an economic context. Furthermore, as mentioned above, anime is considered to cause a positive externality among family members, increasing the number of people who watch anime. There is, therefore, an empirical issue to be investigated: whether there is such an externality. To this end, using individual-level data from Japan, this paper attempts to investigate how adults' behavior in watching anime depends on whether or not they have young children.

The remainder of this paper is organized as follows. In Section 2, the testable hypotheses are discussed. Section 3 provides an explanation regarding data and the empirical method used. Section 4 presents the estimation results and their

[4] Asai (2011) attempted to analyze demand for popular music in Japan, which is also considered as Japanese contemporary culture.

interpretation. The final section offers some conclusions.

2. Hypotheses

In basic economic theory, individuals make a decision regarding the consumption level of goods based on their preferences under income constraints. However, in a real world situation, people live in a social network, including peers in school, neighbors in their community, and spouse or children in their family. Hence, individuals' behaviors and attitudes are based not only on their own preferences under economic constraints, but also by those people belonging to their social network. Such networks possibly affect an individual's decision-making regarding the consumption level of goods[5]. Take for example the family network, where people often choose goods such as leisure activities with an eye to pleasing other family members (Becker 1996). The externality of surrounding people is thought to play a critical role in consuming cultural goods. That is, the consumption of cultural services and the creation of cultural goods have a positive external effect on other individuals via the accumulation of a cultural atmosphere and cultural capital (Cheng 2006).

Anime is assumed to be targeted at young children. If the joint consumption of cultural goods within a family increases not only children's utility levels but also parents', then it is anticipated that parents will watch anime with their children to increase the aggregated utility level of the household[6]. Hence, I advance *Hypothesis 1:*

Hypothesis 1:
People that have young children are more likely to watch anime than those who do not.

The externality becomes smaller when parents are less able to spend time with their children. That is, children do not lead parents to watch anime if parents are under severe time constraints. For instance, children watch anime alone when their

[5] Family members not only influence consumption behavior but also views about political issues. Within a family, daughters have been observed to influence their father's political attitudes (Fernandez et al. 2004; Washington 2008; Oswald and Powdthavee 2010).
[6] Even if watching anime does not influence parents' utility levels, parents naturally glance at anime when children are watching it in the living room.

parents are at work. In this scenario, there is no externality between children and parents. If this holds true, the externality of children is larger for women than men because men are more likely to be full-time workers in Japan, although more women are now working in Japan (Abe 2009; 2011). Here, I propose *Hypothesis 2:*

Hypothesis 2:
The externality of young children is smaller for women than men.

3. Data and Methods

3.1. Data

This paper used individual-level data from a 2008 JGSS (Japanese General Social Surveys)[7]. JGSS use a two-stage stratified sampling method and have been conducted throughout Japan in 2000, 2001, 2002, 2003, 2005, 2006, 2008, 2010, and 2012. Only the 2008 JGSS questionnaire included a question on the consumption of cultural goods; thus, this paper only uses data from 2008. JGSS were designed as a Japanese counterpart to the General Social Survey from the United States. JGSS ask standard questions concerning individuals' characteristics via face-to-face interviews. In the sample used for the estimation, respondents' ages ranged between 21 and 88 years. Thus, all respondents were adults and children were not included in the sample. The data cover information related to marital and demographic (age and gender) status, annual household income[8], years of schooling, age, and prefecture of residence[9].

Concerning the key variable, a survey question asked, "How often do you watch Japanese anime?" Respondents could choose one of four responses: "1 (Not at all)," "2 (Seldom)," "3 (Sometimes)," and "4 (Often)". The frequency distribution of watching anime is illustrated in Figure 1. In this study, the responses (1–4) given by respondents are considered to be the degree of frequency of watching anime.

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[7] Data for this secondary analysis, 'Japanese General Social Surveys (JGSS), Ichiro Tanioka,' was provided by the Social Science Japan Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, The University of Tokyo.

[8] In the original dataset, annual earnings were grouped into 19 categories, and it was assumed that everyone in each category earned the midpoint value. For the top category of "23 million yen and above," I assumed that everybody earned 23 million yen. Approximately 1% of observations fell in this category; therefore, the problem of top-coding should not be an issue here.

[9] A Japanese prefecture is equivalent to a state in the United States or a province in Canada. There are 47 prefectures in Japan.

The variables used in the regression estimations are shown in Table 1, which provides definitions and basic statistics including mean value, maximum value, and minimum value. Table 1 shows that the standard deviation is 0.75, which is larger than the mean value of CHILD (0.36). This shows that the distribution of those who have young children is skewed; this is reasonable because most people do not have young children. The mean value of MARRY is 0.85, showing that 85% of respondents are currently married. The mean value of MALE is 0.45, suggesting that 45% of respondents are male. Hence, the proportions of male and female respondents are relatively even.

3.2. Econometric framework and estimation strategy

In Figure 2, the vertical axis shows the mean value of ANIM within a prefecture and the horizontal line shows the mean value of CHILD within a prefecture. A cursory examination of Figure 2 reveals a positive relationship between ANIM and CHILD, which is consistent with the prediction proposed in the previous section. Table 2 compares the frequency of watching anime between those who have young children and those who do not. Table 2 shows that the mean value of ANIM is 2.94 for those who have young children whereas the mean value of ANIM is 2.21 for those who do not. The difference between them is statistically significant at the 1% level. Hence, those who have young children are more inclined to watch anime than those who do not. This tendency is also observed when the sample is restricted to a male sample and a female sample. Regarding a comparison between genders, and based on the sample of those who have young children, the mean value of ANIM for women is larger than that for men, which is statistically significant at the 10% level. In contrast, based on the sample without young children, there is no statistical difference between mean values for ANIM between genders (however, the mean value of ANIM for women is slightly larger than that for men). This implies that the difference of frequency of watching anime between genders is mainly due to the existence of young children. However, these observations were obtained when individual characteristics were not controlled for. A more precise examination calls for a regression analysis using individual-level data.

For the purpose of examining the hypotheses proposed previously, the estimated function of the baseline model takes the following form:

$$ANIM_i = \alpha_1 \mathrm{CHILD}_i + \alpha_2 \mathrm{AGE}_i + \alpha_3 \mathrm{SCHOOL}_i + \alpha_4 MARRY_i + \alpha_5 INCOM_i + \alpha_6 UNEMP_i + \alpha_7 MALE_i + u_i,$$

where $ANIM_i$ represents the dependent variable in individual i. Regression parameters are represented by α. As explained earlier, values for $ANIM$ range from 1 to 4 and so an ordered probit model was used to conduct the estimations. The error term is represented by u_i. The subjects within groups correlated because they share the same condition, which is analogous to the time invariant fixed effects in the panel data regression model. In this paper, the error terms for the respondents might correlate because unobservable individual characteristics are shared in the same prefecture. In this case, the standard errors of the coefficients might suffer from a downward bias (Moulton 1990). To control for this bias, robust standard errors were calculated by clustering on the prefecture and z-values were then obtained by cluster–robust standard errors[10]. The advantage of this approach is that the magnitude of spatial correlation can be unique to each prefecture.

INCOME, AGE, MARRY, SCHOOL, UNEMP, and MALE were included as independent variables to control for individual characteristics. If an anime program is less artistic or of poorer quality, it may be regarded as an inferior product. If this holds true, then the higher the household income, the less people are likely to watch anime. In this case, coefficient of INCOME will have the negative sign. As exhibited in Table 2, the youngest respondents were aged 21 years and children were excluded from the sample. Hence, the estimation result of AGE does not reflect the difference between children and adults even if anime is mainly targeted at children. However, the Japanese anime industry has developed (Yoon and Malecki, 2009), improving its quality. Therefore, views and attitude about anime differ according to when respondents grew up. Hence, AGE is anticipated to capture this difference between generations. It has been found that an individual's behavior and views are affected by their marital partner (Yamamura 2010). If this is true, then getting married is expected to influence the consumption level of anime. To capture this effect, MARRY is incorporated. It can also be argued that people with a lower level of education may not enjoy high-quality artistic anime work. Hence, the quality of anime seems to be associated with the education level of the consumer. SCHOOL is included to capture this effect. All things being equal (e.g., economic conditions), shared social norms may affect an individual's behavior. Gender difference is anticipated to capture social role or social identity (Akerlof and Kranton, 2000). For this purpose, MALE is incorporated.

[10] To consider such spatial correlation in line with this assumption, I used the Stata cluster command and calculated z-statistics using robust standard errors.

4. Estimation Results

4.1. Baseline estimation

The estimation results of the probit model are presented in Tables 3, 4, 5, 6, 7, and 8. In each table, the sets of independent variables vary according to the different specifications. The number of observations differ because respondents did not answer some questions concerning independent variables. "As usual, the marginal effects of the regressors $\mathbf{x}$ on the probability are not equal to the coefficients." (Greene 2008, 832) Hence, in addition to the coefficient, the marginal effect should be reported to precisely interpret the results. Accordingly, as CHILD is regarded as the key variable, its marginal effects are shown. The results based on the full sample are reported in Table 3. The baseline estimation results to test *Hypothesis 1* are also shown. Furthermore, after dividing the sample into male and female samples, I conducted an estimation of the same specification for the purpose of testing *Hypothesis 2*. The results based on male and female samples are reported in Table 4.

For each gender, the sample was also divided according to the respondents' working hours or the importance of their income within their households. This was done to investigate whether or not time constraints explain the magnitude of the externality within a family. As for the first classification, I used the information as follows: concerning working hours, a survey question asked "How many hours in total do you usually work per week?" Based on the responses, I divided the whole sample into two groups: those who work more than 40 h per week and those who work less than 40 h. A full-time worker is considered to work from 9 a.m.–5 p.m. weekdays, i.e., a full-time worker works 40 h per week. For a robustness check, I also used another classification to divide the sample as follows: concerning job sources, a survey question asked, "Which is your main source of income?" Respondents could choose one of eight responses: "your own income", "spouse or partner's income", "parents' income", "income from family members other than your spouse or parents", "pension", "unemployment benefits", "occasional work", or "other". In this paper, those who chose "your own income" were defined as the main earner within a household. Using this information, I divided the sample into a main earner group and a non-main earner group. Results based on the sample of those who worked more than 40 h per week and those who worked less are reported in Table 5 for men and in Table 7 for women. For a robustness check of Tables 5 and 7, results based on the sample of being a main earner or not are presented in Table 6 for men

and in Table 8 for women.

The results of the estimation are shown in Table 3, and show that the coefficient of CHILD, the key variable, yields the positive sign and is statistically significant at the 1% level in all columns. This means that the results are robust to alternative specifications and are in line with *Hypothesis 1*. The coefficient sign of AGE is negative and statistically significant at the 1% level in all estimations, implying that older people are less inclined to watch anime. This result infers that that people who grew up in a period when the quality of anime was low are less likely to prefer anime. MARRY produces the positive sign in columns (1) and (2), and is only statistically significant in column (1). Hence, the results of MARRY are not robust. INCOME and UNEMP are not statistically significant. This indicates that anime are not considered to be inferior goods. Concerning MALE, a significant negative sign is observed in all columns, implying that men are less inclined to watch anime than women. Hence, it can be inferred that men are in general more likely to be full-time workers than women. Therefore, time constraints are greater on men than women, possibly preventing men from watching anime. I will examine this possibility later.

I now turn to Table 4. CHILD yields the positive sign in all estimations. The results in column (2) based on the male sample are not statistically significant but are in all other columns. Furthermore, the z-values are distinctly larger for results for the female sample than for the male sample. In addition, the marginal effects are larger for results based on the female sample than for the male sample. For instance, in column (1), male respondents are 1 percentage point more likely to choose '4' (often watched anime) when they have an additional child aged under 12 years. In contrast, with respect to the same specification for women in column (4), female respondents are 3 percentage points more likely to choose '4' when they have an additional child aged under 12 years. Considering these results together reveals that young children have a greater effect on their mother to watch anime than on their father. *Hypothesis 2* is thus corroborated by the evidence presented in Table 4. AGE continues to have the negative sign and is statistically significant at the 1% level. The coefficient of SCHOOL has the negative sign despite being statistically insignificant for men, whereas its sign is positive and statistically significant for women. As seen in the work of Hayao Miyazaki (Yoon and Malecki 2009), anime with an artistic quality are aimed at both young children and adults. One possible interpretation is that men tend to be full-time workers and so focus mainly on work, while women are more likely to be part-time workers or full-time housewives and

have time to engage in hobbies such as anime of higher artistic quality. It is interesting to observe that MARRY is statistically significant only for men although the coefficient of MARRY has the positive sign in all columns. It was also found that women are more inclined to watch anime (Table 3). Jointly considering the results of MALE in Table 3 and MARRY in Table 4 leads me to argue that when men marry they watch anime via the positive externality coming from their wives. That is, interactions between family members are observed not only between young children and their parents, but also between wives and husbands. As a consequence, living with an anime fan leads people who are not usually anime enthusiasts to watch anime.

4.2. Investigating effects of time constraints

Regarding the proposed *Hypothesis 2*, I assumed that there are different time constraints for men and women because of the differences in their working hours. Thus, I conducted a further examination into whether it is only economic conditions that produce different results for men and women. Tables 5, 6, 7, and 8, show the results after comparing the groups (groups defined by differences in working hours or the importance of one's earnings within a household). Table 5 shows that CHILD has the positive sign and is statistically significant for men who work more that 40 h per week, whereas CHILD has the negative sign and is statistically insignificant in columns (5) and (6) for men who work less than 40 h per week. This is a surprising result because it shows that men are more likely to watch anime under more severe time constraints, which contradicts the assumption of this paper. It is difficult to explain the results of CHILD; however, one possible interpretation is that a scarcity of time to spend with one's children means that men act to efficiently share a hobby (watching anime) with their children. It would generally take too long for a father to get his children to engage in activities he is interested in. In contrast, it easier and quicker for a father to accept and engage in the hobbies his children prefer, even when it is a hobby he is not interested in. As a consequence, the busier the father, the more likely he is to follow his children and watch anime. With respect to MARRY, its coefficients have the positive sign in all columns and are statistically significant for men who work less than 40 h per week. Jointly considering the results exhibited in Tables 3–5 leads me to argue that husbands who tend to have spare time are likely to be influenced by their wives' hobbies[11]. For

[11] Interactions between a married couple have an effect on political views and earnings.

a robustness check of Table 5, I checked the results of Table 6, where men are grouped as either the main earner of a household or not. Concerning CHILD, its coefficient has positive signs for main earners and negative signs for non-main earners. Furthermore, they are statistically significant, with the exception of column (2). Therefore, the results of CHILD do not change according to the alternative estimations. Regarding the other control variables, the results of Table 5 are very similar to those of Table 6. Hence, the estimation results of Table 5 can be considered as robust.

Table 7 shows that the sign of the coefficient of CHILD is positive and statistically significant in all columns. Furthermore, its marginal effects and z-values are larger for results based on women who work less than 40 h per week compared with women who work more than 40 h. This implies that existence of young children has a smaller effect on women under more severe time constraints. This is consistent with the inference based on basic economics. However, the combined results of Tables 5 and 7 can be interpreted as suggesting that young children lead full-time workers to watch anime. In this study, I also compared the marginal effects of CHILD between genders. The results shown in column (4) of Table 5 and column (4) of Table 7 show that female respondents are 6 percentage points more likely to choose '4' (often watch anime) when they have an additional child aged under 12 years while male respondents are 3 percentage points more likely to choose '4'. It is interesting to note that the externality of young children for full-time female workers is larger than that for full-time male workers. This means that the externality caused by young children is larger for women than men, even after controlling for time constraints. The estimation results of Table 8 are very similar to those of Table 7, suggesting that the results of Table 7 are robust. From the evidence provided thus far, I derive the argument that social identity, as advocated by Akerlof and Kranton (2000), seems to enlarge the externality of children. In this case, the social identity is the norm that a mother should share time with her children rather than enjoy her hobby alone.

In Japan, anime and manga (Japanese comics) are generally considered as goods for children rather than adults[12]. Furthermore, parents usually discourage their

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It has been shown that a wife's large human capital is associated with the high earnings of her husband (e.g., Benham 1974; Jepsen 2005; Huang et al. 2009). The political view of a husband has been observed to be influenced by his wife's political views (Yamamura 2010).

[12] Manga is different from anime in the point that consumers cannot read and enjoy manga with others. Hence, the externality for manga is thought to be smaller than for

children from watching anime and reading manga because they believe they are juvenile pastimes and have a detrimental effect on children by taking up study time. However, some anime and manga forms are sophisticated and attract not only children but also adults (Napier 2000). In response to this, the Japanese government has now recognized that anime and manga have each established their own respective independent fields. These two fields are also the foundation for new media arts, and as such it is necessary that they be further promoted (MEXT, 2000)[13]. A number of academic researchers now solely focus on contemporary culture, such as anime and manga. For example, in 2006, Kyoto Seika University created the first academic department of contemporary culture covering anime and manga. Furthermore, the Kyoto International Manga Museum was established in 2006 by a joint project between the Kyoto City Government and the Kyoto Seika University[14]. Subsequently, a public museum, Kitakyushu Manga Museum, was established in 2012. Meiji University in Tokyo plans to open the tentatively named Tokyo International Manga Library in 2014 (Daily Yomiuri 2011). In addition, Taro Aso, a former Japanese prime minister, is well known to be very fond of manga and recognizes its cultural value (Daily Yomiuri, 2008). As a consequence, the perceptions of adults towards anime and manga are becoming more positive and more adults are enjoying anime with their children. In summary, the changing attitudes of adults towards anime reflect the changes in contemporary culture in Japan. This is in line with the argument that the accumulation of cultural atmosphere and cultural capital influence the behavior of people (Cheng 2006).

5. Conclusions

Both children and teenagers are fascinated by Japanese anime, and anime is now regarded as a major form of modern culture in Japan. However, young children (primary-aged children) cannot watch anime films at a movie theater by themselves; parents must accompany their children. Hence, the consumption of such a modern cultural product depends not only on the preference of children and teenagers but also on that of their parents. That is, the preference of children leads

anime.

[13] Professor Kentaro Takemura is a creator and critic of manga at the Kyoto Seika University. He has been reported to have an ambivalent reaction to the fact that manga is now officially recognized by the Japanese government (Takekuma 2004, 67–70).

[14] "Manga and anime museums have sprung up across Japan since the 1990s" (Daily Yomiuri, 2011).

their parents to watch anime even if parents do not want to. Such an externality has, however, not been investigated by academic researchers. This papers attempts to explore how and the extent to which the existence of young children increases the frequency of their parents' viewing of anime.

Using an ordered probit model with individual-level data from Japan, I found that people are more likely to watch anime when they have children under the age of 12 years. This implies that an externality coming from children results in parents watching anime. The positive association between watching anime and having children aged less than 12 years is observed for women no matter whether or not they are the main income earner for a household. Furthermore, the externality is larger for women than men regardless of their time constraints. In my interpretation, the identity of a woman to behave as a mother, discussed by Akerof and Kranton (2000), results in a mother consuming cultural goods with her children. In other words, a mother can increase her utility level to a greater degree when she watches anime with her children compared with watching it alone. Thus, socioeconomic factors such as the externalities, cultural atmosphere, and identity play a critical role in enlarging the market of modern cultural goods.

Because of the limitation of the data, this paper concentrates on the domestic Japanese anime market. Hence, there is a question as to whether or not the results derived from this study can be generalized. Japanese anime has extended its market to Western countries, including the United States and Europe. It would be interesting to examine the process where there has been an increase in demand for Japanese anime in countries culturally and economically distinct from Japan. This remaining issue can be addressed in future studies.

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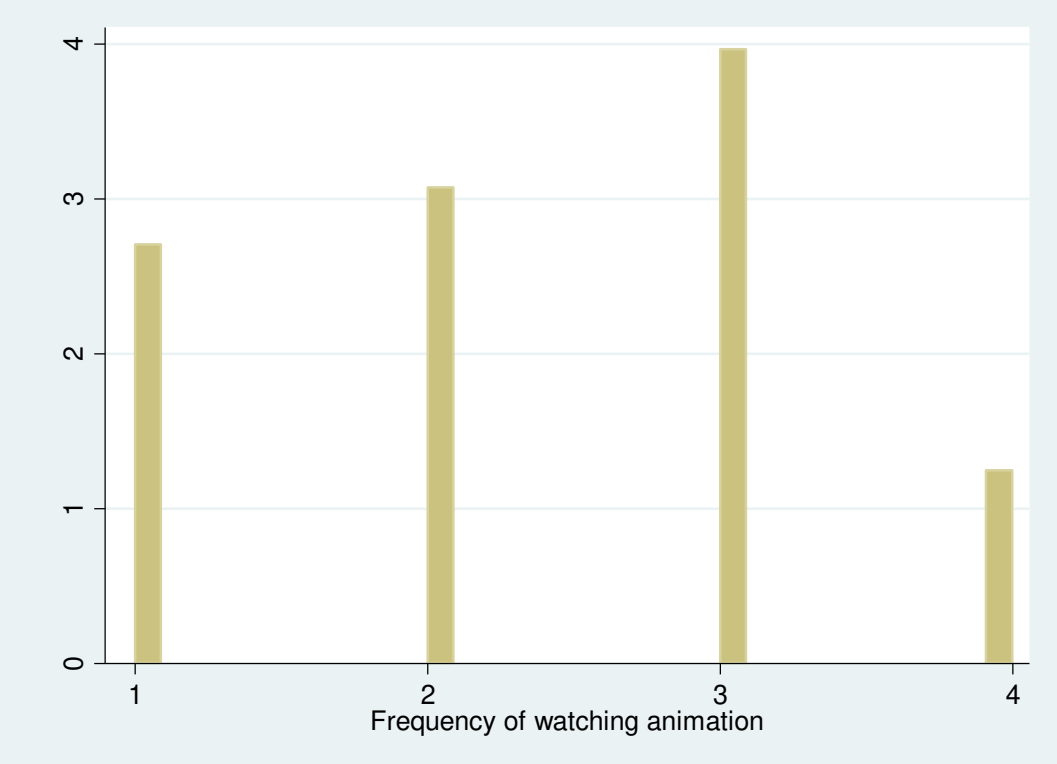

Figure 1. Distribution of views regarding income redistribution

Note:

Respondents were asked: “How often do you watch Japanese anime?” There were four response options: “1 (Not at all),” “2 (Seldom),” “3 (Sometimes),” and “4 (Often)”.

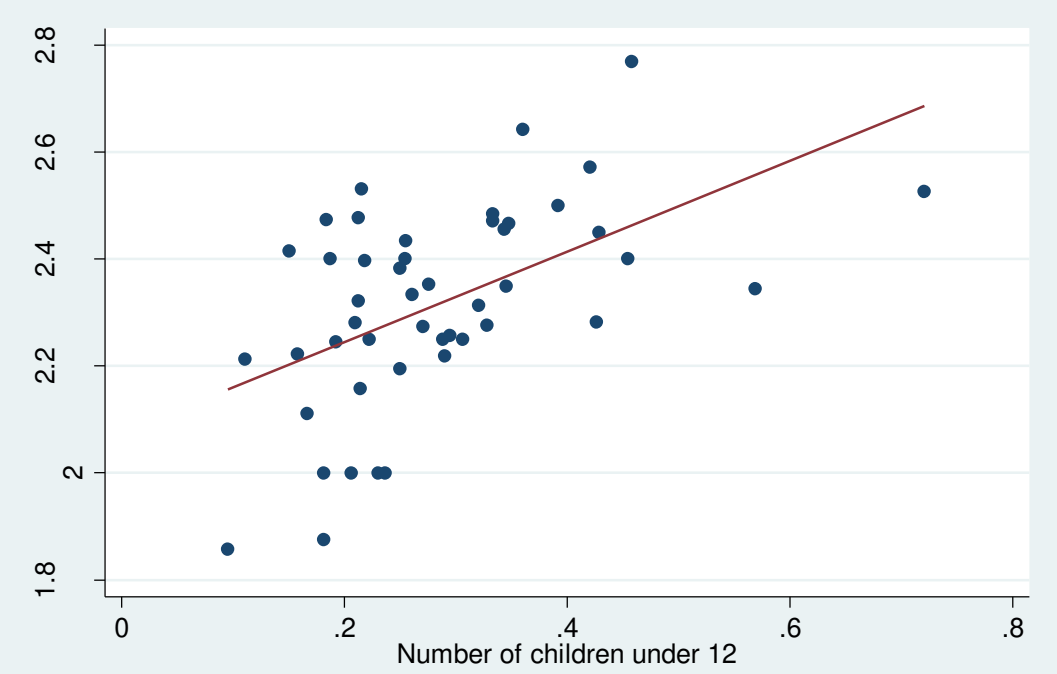

Figure 2. Association between number of children aged less than 12 years and frequency of watching anime

Note: Frequency of watching anime and number of children aged less than 12 years are average values in each prefecture.

Table 1. Definition of variables and descriptive statistics

	Definitions	Mean	Standard deviation	Minimum	Maximum
ANIM	Frequency of watching anime: Respondents had four response options: "1 (Not at all)," "2 (Seldom)," "3 (Sometimes)," and "4 (Often)"	2.29	0.96	1	4
CHILD	Number of children aged less than 12 years	0.36	0.75	0	4
AGE	Age	55.3	14.93	21	88
SCHOOL	Years of schooling	12.5	2.46	6	18
MARRY	Takes 1 if respondents are currently married, otherwise 0	0.85	---	0	1
INCOME	Individual household income (million yen)	0.58	0.40	0	2.3
UNEMP	Takes 1 if respondents are currently unemployed, otherwise 0	0.01	---	0	1
MALE	Takes 1 if respondents are male, otherwise 0	0.45	---	0	1

Note: Sample is the equivalent of those used in estimations for columns (1)–(3) of Table 3.

Table 2. Mean difference test of frequency of watching anime between those who have children aged less than 12 years or not

	Those who have children aged less than 12 years (1)	Those who do not have children aged less than 12 years (2)	Absolute t-value for mean difference test H_0: (1) – (2) = 0
Full sample	2.94 (378)	2.21 (1762)	13.9**
Male sample (a)	2.86 (165)	2.19 (830)	8.22**
Female sample (b)	3.01 (213)	2.22 (932)	11.3**
Absolute t-value for mean difference test H_0: (a) – (b) = 0	1.84*	0.58	

Note: Numbers in parentheses are observations. * and ** indicate significance at the 1% and 10 % levels, respectively.

Table 3. Estimation based on full sample; dependent variable is ANIM (ordered probit model)

	(1)	(2)	(3)
CHILD	0.17***	0.15***	0.20***
	(3.72)	(3.95)	(5.98)
AGE	–0.03***	–0.03***	–0.03***
	(–11.3)	(–11.9)	(–15.1)
SCHOOL	0.02	0.007	0.004
	(1.47)	(0.56)	(0.37)
MARRY	0.20**	0.09	
	(1.98)	(1.02)	
INCOME	–0.07		
	(–0.90)		
UNEMP	–0.56		
	(–1.46)		
MALE	–0.13**	–0.15***	–0.10**
	(–2.41)	(–2.73)	(–2.05)
Marginal effect of **CHILD**			
ANIM (= 1)	–0.05***	–0.04***	–0.05***
	(–3.69)	(–3.99)	(–6.13)
ANIM (= 2)	–0.01***	–0.01***	–0.02***
	(–3.54)	(–3.48)	(–5.22)
ANIM (= 3)	0.04***	0.04***	0.05***
	(3.74)	(3.92)	(5.91)
ANIM (= 4)	0.02***	0.01***	0.03***
	(3.45)	(3.75)	(5.63)
Log pseudo-likelihood	–1545	–2078	–2511
Observations	1317	1774	2119

Note: Values without parentheses are coefficients. Values in parentheses are z values calculated using robust standard errors clustered in the prefecture. *, **, and *** indicate significance at the 10, 5, and 1% levels, respectively.

Table 4. Estimation for comparison between genders; dependent variable is ANIM (ordered probit model)

	(1)	(2)	(3)	(4)	(5)	(6)
	Male sample			Female sample		
CHILD	0.11*	0.07	0.12**	0.25***	0.23***	0.30***
	(1.84)	(1.26)	(2.40)	(3.09)	(3.53)	(5.64)
AGE	–0.03***	–0.03***	–0.03***	–0.02***	–0.02***	–0.02***
	(–8.98)	(–10.0)	(–13.4)	(–5.65)	(–7.70)	(–9.00)
SCHOOL	–0.01	–0.01	–0.009	0.06**	0.03**	0.02*
	(–0.52)	(–0.87)	(–0.62)	(2.54)	(2.05)	(1.83)
MARRY	0.38*	0.31**		0.15	0.02	
	(1.96)	(1.99)		(1.27)	(0.27)	
INCOME	–0.02			–0.16		
	(–0.27)			(–1.38)		
UNEMP	–0.67			–0.47		
	(–1.09)			(–1.05)		
Marginal effect of CHILD						
ANIM (= 1)	–0.03*	–0.02	–0.03**	–0.07***	–0.06***	–0.08***
	(–1.84)	(–1.27)	(–2.44)	(–3.12)	(–3.66)	(–5.89)
ANIM (= 2)	–0.01*	–0.004	–0.01**	–0.03***	–0.02***	–0.03***
	(–1.69)	(–1.12)	(–2.16)	(–2.80)	(–2.95)	(–4.45)
ANIM (= 3)	0.02*	0.01	0.03**	0.06***	0.06***	0.07***
	(1.84)	(1.25)	(2.35)	(3.18)	(3.50)	(5.49)
ANIM (= 4)	0.01*	0.008	0.01**	0.03***	0.03***	0.04***
	(1.76)	(1.26)	(2.38)	(2.73)	(3.34)	(5.27)
Log pseudo-likelihood	–713	–910	–1159	–824	–1162	–1346
Observations	604	780	984	713	994	1135

Note: Values without parentheses are coefficients. Values in parentheses are z values calculated using robust standard errors clustered in the prefecture. *, **, and *** indicate significance at the 10, 5, and 1% levels, respectively.

Table 5. Estimation for male sample: comparison between those who work more than 40 h per week and those who work less than 40 h; dependent variable is ANIM (ordered probit model)

	(1)	(2)	(3)	(4)	(5)	(6)
	Working hours ≥40			Working hours <40		
CHILD	0.20***	0.13**	0.14**	–0.35**	–0.26	–0.06
	(3.22)	(2.36)	(2.50)	(–2.14)	(–1.29)	(–0.23)
AGE	–0.03***	–0.03***	–0.03***	–0.05***	–0.05***	–0.03***
	(–5.00)	(–5.20)	(–8.76)	(–8.08)	(–7.79)	(–10.1)
SCHOOL	0.01	0.01	0.008	–0.03	–0.03*	–0.02
	(0.57)	(0.61)	(0.47)	(–1.57)	(–1.80)	(–1.41)
MARRY	0.13	0.23		0.80***	0.45*	
	(0.48)	(0.97)		(2.95)	(1.92)	
INCOME	0.21			–0.47***		
	(1.38)			(–2.89)		
UNEMP				–0.67		
				(–1.30)		
Marginal effect of CHILD						
ANIM (= 1)	–0.05***	–0.03**	–0.03**	0.13**	0.10	0.02
	(–3.15)	(–2.38)	(–2.50)	(2.14)	(1.28)	(0.23)
ANIM (= 2)	–0.02***	–0.01**	–0.02**	–0.01	–0.02	–0.001
	(–3.04)	(–2.23)	(–2.41)	(–1.33)	(–1.08)	(–0.21)
ANIM (= 3)	0.04***	0.03**	0.02**	–0.09**	–0.06	–0.01
	(3.45)	(2.48)	(2.55)	(–2.12)	(–1.33)	(–0.23)
ANIM (= 4)	0.03***	0.02**	0.02**	–0.01**	–0.01	–0.004
	(2.66)	(2.13)	(2.36)	(–2.09)	(–1.22)	(–0.23)
Log pseudo-likelihood	–433	–544	–717	–269	–361	–440
Observations	357	448	591	247	332	393

Note: Values without parentheses are coefficients. Values in parentheses are z values calculated using robust standard errors clustered in the prefecture. *, **, and *** indicate significance at the 10, 5, and 1% levels, respectively.

Table 6. Estimation for male sample: comparison between main earner and others; dependent variable is ANIM (ordered probit model)

	(1)	(2)	(3)	(4)	(5)	(6)
	Main earner			Non-main earner		
CHILD	0.13**	0.09	0.15***	–1.11***	–1.10***	–0.78***
	(2.10)	(1.56)	(2.73)	(–2.79)	(–3.06)	(–2.92)
AGE	–0.03***	–0.04***	–0.03***	–0.04***	–0.05***	–0.03***
	(–7.47)	(–8.14)	(–12.5)	(–3.32)	(–4.68)	(–7.10)
SCHOOL	–0.003	–0.005	–0.008	–0.03	–0.03	–0.01
	(–0.14)	(–0.31)	(–0.48)	(–0.91)	(–1.29)	(–0.49)
MARRY	0.09	0.13		1.22***	0.80***	
	(0.37)	(0.63)		(3.95)	(3.26)	
INCOME	0.08			–0.63*		
	(0.60)			(–1.74)		
UNEMP				–0.17		
				(–1.29)		
Marginal effect of CHILD						
ANIM (= 1)	–0.03**	–0.02	–0.03***	0.43***	0.43***	0.29***
	(–2.12)	(–1.59)	(–2.81)	(2.78)	(3.06)	(2.86)
ANIM (= 2)	–0.01**	–0.009	–0.02**	–0.08**	–0.10***	–0.02
	(–1.93)	(–1.42)	(–2.47)	(–2.45)	(–3.09)	(–1.49)
ANIM (= 3)	0.03**	0.02	0.03***	–0.31***	–0.29***	–0.22***
	(2.15)	(1.56)	(2.65)	(–2.62)	(–2.80)	(–2.91)
ANIM (= 4)	0.02**	0.01	0.02***	–0.03	–0.03*	–0.04**
	(1.92)	(1.50)	(2.69)	(–1.41)	(–1.68)	(–1.98)
Log pseudo-likelihood	–536	–685	–885	–166	–216	–269
Observations	448	577	741	156	203	243

Note: Values without parentheses are coefficients. Values in parentheses are z values calculated using robust standard errors clustered in the prefecture. *, **, and *** indicate significance at the 10, 5, and 1% levels, respectively.

Table 7. Estimation for female sample: comparison between those who work more than 40 h per week and those who work less than 40 h; dependent variable is ANIM (ordered probit model)

	(1)	(2)	(3)	(4)	(5)	(6)
	Working hours ≥40			Working hours <40		
CHILD	0.37**	0.30**	0.39***	0.26***	0.24***	0.30***
	(2.47)	(2.31)	(3.60)	(2.86)	(3.17)	(4.43)
AGE	–0.02***	–0.03***	–0.02***	–0.02***	–0.02***	–0.02***
	(–3.65)	(–4.89)	(–6.42)	(–4.45)	(–6.72)	(–6.84)
SCHOOL	–0.03	–0.006	–0.03	0.08***	0.04**	0.04**
	(–0.69)	(–0.17)	(–0.87)	(2.86)	(2.43)	(2.21)
MARRY	0.08	–0.006		0.18	0.05	
	(0.37)	(–0.04)		(1.53)	(0.47)	
INCOME	0.27			–0.12		
	(0.97)			(–0.98)		
UNEMP				–0.43		
				(–0.97)		
Marginal effect of CHILD						
ANIM (= 1)	–0.06**	–0.05**	–0.06**	-0.08***	–0.07**	–0.09***
	(–2.30)	(–2.13)	(–3.22)	(-2.87)	(–3.30)	(–4.58)
ANIM (= 2)	–0.08**	–0.06**	–0.08***	–0.02**	–0.01**	–0.02***
	(–2.31)	(–2.19)	(–3.14)	(–2.48)	(–2.41)	(–3.27)
ANIM (= 3)	0.07**	0.05**	0.06***	0.07***	0.06***	0.07***
	(2.17)	(2.00)	(2.88)	(2.97)	(3.19)	(4.50)
ANIM (= 4)	0.06**	0.05**	0.08***	0.03**	0.03***	0.04***
	(2.44)	(2.37)	(3.57)	(2.45)	(2.89)	(3.95)
Log pseudo-likelihood	–150	–219	–306	–669	–940	–1033
Observations	132	192	265	581	802	870

Note: Values without parentheses are coefficients. Values in parentheses are z values calculated using robust standard errors clustered in the prefecture. *, **, and *** indicate significance at the 10, 5, and 1% levels, respectively.

Table 8. Estimation for female sample: comparison between main earner and others; dependent variable is ANIM (ordered probit model)

	(1)	(2)	(3)	(4)	(5)	(6)
	Main earner			Non-main earner		
CHILD	0.19*	0.22**	0.28***	0.40***	0.32***	0.37***
	(1.78)	(2.33)	(3.41)	(3.12)	(3.81)	(5.61)
AGE	–0.03***	–0.02***	–0.02***	–0.01**	–0.02***	–0.02***
	(–5.38)	(–5.35)	(–6.51)	(–2.36)	(–4.96)	(–6.17)
SCHOOL	0.003	0.0008	–0.01	0.12***	0.06***	0.06***
	(0.10)	(0.03)	(–0.88)	(3.57)	(2.79)	(3.23)
MARRY	0.03	–0.14		0.29*	0.16	
	(0.24)	(–1.16)		(1.96)	(1.29)	
INCOME	–0.14			–0.16		
	(–1.00)			(–0.92)		
UNEMP				–0.33		
				(–0.74)		
Marginal effect of CHILD						
ANIM (= 1)	–0.03*	–0.04**	–0.05***	–0.13***	–0.11***	–0.13***
	(–1.75)	(–2.30)	(–3.33)	(–3.22)	(–3.99)	(–5.83)
ANIM (= 2)	–0.03*	–0.04**	–0.05***	–0.02*	–0.01	–0.01*
	(–1.78)	(–2.33)	(–3.32)	(–1.72)	(–1.47)	(–1.96)
ANIM (= 3)	0.04*	0.03**	0.05***	0.12***	0.09***	0.10***
	(1.79)	(2.23)	(3.07)	(3.12)	(3.57)	(5.25)
ANIM (= 4)	0.03*	0.03**	0.05***	0.03**	0.03***	0.03***
	(1.71)	(2.38)	(3.56)	(2.50)	(3.42)	(4.69)
Log pseudo-likelihood	–423	–563	–692	–392	–590	–641
Observations	360	471	575	353	523	560

Note: Values without parentheses are coefficients. Values in parentheses are z values calculated using robust standard errors clustered in the prefecture. *, **, and *** indicate significance at the 10, 5, and 1% levels, respectively.

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