# The effect of young children on their parents' anime viewing habits: Evidence from Japanese micro data

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## Abstract

Anime is now considered an accepted form of animation and is considered to represent Japanese contemporary culture worldwide. There are many fans of anime and manga, creating a community known as *otaku* world. However, Japanese anime and manga have gained popularity in Western countries as well as in Japan. This paper attempts to ascertain the determinants of watching anime in Japan based on individual-level data from Japan. Despite the growth in the number of adult anime fans, children are still more likely to watch anime than adults are. Hence, this study investigates how adults are influenced by the presence 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 who have not yet entered junior high school. Such an effect is larger for parents who belong to an older generation where people are less likely to prefer anime. This implies that the externality coming from children results in parents watching anime. The findings of this study show that externalities from surrounding people play a critical role in enlarging the market of modern cultural goods representing "Cool Japan".



*JEL classification:* D12, Z11, Z19

*Keywords:* Anime; Japan; Externality; Contemporary culture; Otaku; Cool Japan.

## 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)[1]. "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 ranked second and third in terms of theater attendance 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)[2].

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 consumption externality between family members (Hoge et al. 1982; Calvo-Armengol and Jackson 2009). In

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

[2] 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).

terms of 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. Consequently, 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)[3]. However, little is known about the anime market in Japan, despite anime now leading the Japanese popular culture industry, commonly called "Cool Japan". 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. This paper is the first to investigate the determinants of the demand for Japanese anime using statistical methods from an economics perspective.

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

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 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[4]. 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).

The quality of anime has improved in recent years and it now attracts the greatest number of adult viewers in its history. Despite the growth in the number of adult anime fans, known as *otaku*, it is children who are more likely to fall under the spell of anime. However, regardless of the recent change in the demand for anime, anime is still largely assumed to be entertainment for 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[5]. Hence, the *Hypothesis* is advanced as follows:

*Hypothesis:*

[4] 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).

[5] Even if watching anime does not influence parents' utility levels, parents naturally glance at anime when children are watching it in the living room.

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

## 3. Data and Methods

### *3.1. Data*

This paper used individual-level data from a 2008 JGSS (Japanese General Social Surveys)[6]. 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[7], years of schooling, age, and prefecture of residence[8].

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.

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. CHILD is a dummy variable to capture the effect of respondents with children aged under 12 years who have not yet entered junior high school. In general, on entering junior high school, children are more inclined to spend time outside of the home. This is partly because in Japan they tend to participate in

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[6] 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.

[7] 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," it is 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.

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

extracurricular activities or attend tutoring school, reducing interaction between children and parents. Thus, children are likely to interact with their parents before entering junior high school, which in turn possibly causes the externality. Table 1 shows that the standard deviation of CHILD is 0.75, which is larger than the mean value of CHILD (0.36). This is consistent with the illustration provided in Figure 2, which shows that the distribution of those who have young children is skewed towards 0. This observation is reasonable because most people do not have young children aged below 12 years, even if people have children. Figure 3 shows the distribution of the ages of parents who have young children. The figure shows that respondents aged between mid-30s and early 40s are likely to have young children. This implies that these children were likely to have been born when their parents were in their late 20s and 30s. This appears to reflect the tendency for people to marry later in modern Japan. 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. Preliminary observations.*

In Figure 4, 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 4 reveals a positive relationship between ANIM and CHILD, which is consistent with the prediction proposed in the previous section. However, this relation is observed when other individual level characteristics are not controlled for. Thus, a closer examination of the relation calls for regression analysis. The regression analysis and results are presented later in this paper.

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 and 2.21 for those who do not. The difference between them is 0.73 and is statistically significant at the 1% level. Hence, those who have young children are clearly more likely to watch anime than those who do not. From a different view, a respondent's age is thought to be closely associated with the probability that they watch anime. Table 2 also shows the difference in the frequency of watching anime between people classified as belonging to a younger or older generation. In Table 2, the younger generation is defined as those aged younger than 30 (or 40) years and the older generation is those aged above 30 (or 40). Table 2 suggests that the mean value of ANIM is 2.91 for those who are younger

than 30 years and 2.26 for all others. The difference of ANIM between generations is 0.65. In the case that an alternative definition of generations is used, the mean value of ANIM is 2.88 for those who are younger than 40 years and 2.13 for all others, with a difference of 0.75. These differences are statistically significant at the 1% level. Therefore, younger people are clearly more inclined to watch anime than older people.

As shown above, the generation to which an individual belongs and the presence of young children are observed to affect the frequency of respondents' watching anime. As demonstrated in Figure 3, in this study nobody above the age of 60 years has young children. Thus, Table 3 shows that CHILD is negatively correlated with AGE_30 (or AGE_40). Furthermore, the absolute value of the correlation coefficient between CHILD and AGE_40 is 0.64, which is approximately four times larger than the difference (0.17) between CHILD and AGE_30. Considering these results together leads to the prediction that the probability of having children is associated with a respondent's generation. For a closer examination, it is necessary to look at the effect of having young children by disentangling the generation effect.

To this end, as shown in Table 2, the sample is further divided and ANIM is compared between the various groups. First, we will compare those who have young children and those who do not, based on a sample of the older generation. The mean value of ANIM for those who have children is larger than that for those who do not, and is statistically significant at the 1% level. This is observed regardless of the definition of generation used. In addition, when the older generation of parents is defined as those aged over 30, the mean value of ANIM is 2.93 for those who have young children and 2.12 for those who do not. Hence, the difference is only 0.81. The difference is 0.84 when older generation is defined as those aged over 40.

When making the same comparison using the younger generation sample (aged younger than 30 years old), the mean value of ANIM is 3.04 for those who have young children and 2.88 for those who do not. The difference is only 0.16 and is not statistically significant. The same comparison based on the generation sample aged younger than 40 years old shows a statistically significant difference between those who have young children and those who do not. However, its difference is only 0.14, meaning that the difference is only one sixth of the difference obtained for the older generation. It follows from these observations that the presence of young children has a distinctly larger positive influence on the frequency of their older parents' watching anime than younger ones.

Regarding a comparison between generations, and based on the sample of those

who have young children, the difference of the mean value of ANIM is approximately 0.11 (0.06) when the younger generation refers to those aged younger than 30 (40) years. The difference is relatively small and not statistically significant in any case. When studying the group that does not have young children, the difference of the mean value of ANIM is approximately 0.76 and statistically significant at the 1% level. This result is observed regardless of the definition used for the younger generation. All in all, the difference between generations has no effect on the frequency of respondents' watching anime when they have young children. In contrast, the difference between generations has a large positive effect on the frequency of respondents' watching anime when they do not have young children.

The combined results provided in Table 2 show that the externality of young children can be observed because those who are unlikely to prefer anime tend to watch it only when they have young children. However, this argument is only based on the results when other factors are not controlled for. Hence, a further examination via a regression analysis is described in section 3.3

### *3.3. Econometric framework and estimation strategy*

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

$$ANIM_i = \alpha_1 CHILD_i + \alpha_2 AGE\_30_i \text{ (or } AGE\_40_i) + \alpha_3 CHILD*AGE\_30_i \text{ (or } AGE\_40_i) + \alpha_4 MALE_i + \alpha_5 SCHOOL_i + \alpha_6 INCOME_i + \alpha_7 MARRY_i + \alpha_8 WORKHR_i + \alpha_9 UNEMP_i + u_i,$$

where $ANIM_i$ represents the dependent variable in individual *i*. Regression parameters are represented by $\alpha$. 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[9]. The advantage of this approach is that the magnitude of spatial correlation can be unique to each prefecture.

According to the hypothesis proposed in Section 2, the sign of the coefficient of CHILD is expected to be positive, and based on the results in Table 2, the expected sign of the coefficient of AGE_30 (or AGE_40) becomes negative. Furthermore, if the older generation is less likely to watch anime, the effect of having young children is larger for the older generation than the younger generation because respondents in the younger generation are more likely to watch anime regardless of having young children. Therefore, the cross-term of CHILD and AGE_30 ( or AGE_40) is predicted to be positive.

MALE, SCHOOL, INCOME, MARRY, WORKHR and UNEMP were included as independent variables to control for individual characteristics. The Japanese anime industry has developed in recent years (Yoon and Malecki, 2009), leading to an improvement in its quality. As a consequence, anime is considered to represent stereotypical cultural goods within the concept of "Cool Japan" (JETRO 2005a). Furthermore, anime may be regarded as a superior product. If this holds true, then the higher the household income, the more people are likely to watch anime. In this case, the coefficient of INCOME will be positive. 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. Hence, the quality of anime seems to be associated with the education level of the consumer, and hence an improvement in the quality of anime may result in people with higher education levels watching anime. SCHOOL is included to capture this effect and thus its sign of coefficient is expected to be positive. 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. Respondents' jobs status and working hours are thought to capture their time constraints and also opportunity cost. The greater the time constraints, the less inclined people are to spend time on leisure activities such as watching anime. In addition, the opportunity cost is low for unemployed people. Naturally, unemployed people are more likely to watch anime. Therefore, WORKHR and UNEMP are expected to be

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

negative.

## 4. Estimation Results and Discussion

### *4.1. Estimation results*

The estimation results of the ordered probit model are presented in Tables 4 and 5. In each table, the sets of independent variables vary according to the different specifications. The number of observations differs because not all respondents answered all of the questions concerning independent variables. The baseline results are reported in Table 4. Furthermore, this paper conducted an estimation to examine whether the presence of young children differs according to their parents' age. To this end, an interaction dummy between CHILD and AGE_30 (or AGE_40) is incorporated as a dependent variable and its results are shown in Table 5. "As usual, the marginal effects of the regressors **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, because CHILD and the interaction term between CHILD and AGE_30 (or AGE_49) are regarded as key variables, their marginal effects are reported.

As presented in Table 3, correlations between independent variables are observed. For instance, WORKHR is positively correlated with MALE, which is congruent to the Japan labor market where there are less female workers than male (Abe 2009 2011). Furthermore, WORKHR is positively correlated with INCOME, which is in line with the intuition that the longer the working hours, the larger the income level, all other things being equal. These correlations imply that a multicollinearity problem may exist. With the aims of avoiding the problem and checking the robustness of the estimation results, and in addition to a full model where all independent variables are included, estimations of alternative specifications were conducted excluding some independent variables. The results of the full model are reported in columns (1) and (4) of Tables 4 and 5.

Table 4 shows that the coefficient of CHILD, a key variable, is positive and statistically significant at the 1% level in all columns. This means that the results are robust to alternative specifications and are in line with the *Hypothesis*. In addition, the marginal effects of having young children are considered. For instance, in column (1), people are 6% more likely to choose '4' (often watched anime) when they have an additional child aged under 12 years. Furthermore, they are 13% less likely to choose '1' (did not watch anime at all). The marginal effects are similar in

other columns, suggesting its robustness. The coefficients of AGE_30 and AGE_40 are 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.

Concerning MALE, a significant negative sign is observed in all columns, implying that men are less inclined to watch anime than women. Women are more inclined to do housework such as cooking and cleaning compared with men, even when all other things are equal (Akerlof and Kranton, 2000). Hence, women spend more time in the house than men. TV is an easily accessible leisure activity within the home. Consequently, women tend to enjoy TV, possibly increasing the frequency of watching anime on TV. Consistent with the prediction, the significantly positive sign of SCHOOL in all columns is considered to reflect that the recent improvement in the quality of anime satisfies the preferences of people with higher levels of education, resulting in an increase in this group's demand for anime. MARRY is positive and statistically significant in columns (1) and (4). A possible interpretation of this result is that TV viewing is an activity that is shared between married couples and so the couple inevitably watches the same program on TV. If one spouse watches anime on TV, then the other naturally watches it regardless of preference. That is, similar to the effect of having young children, married couples are affected by their spouse's viewing habits. Hence, interactions between family members are observed not only between young children and their parents, but also between wives and husbands. However, a closer examination of this inference is beyond the scope of this paper and should be explored in future studies. INCOME and UNEMP are not statistically significant. However, WORKHR is significantly positive, which does not support the prediction. This result can be interpreted as follows: busy people like to save time because of the scarcity of their time for leisure. People can enjoy watching anime on TV in their home and so the time cost of going outside is saved. Therefore, a severe time constraint causes people to watch anime.

Turning to Table 5, the focus is on the results of the key variables because the results of other control variables are similar to those in Table 4. Here, the key variables are the interaction terms between CHILD and AGE_30 (or AGE_40). In columns (1)–(3), all coefficients of CHILD*AGE_30 are positive. However, the result in column (1) is not statistically significant. In contrast, the result in column (2) shows significance at the 10% level and the result in column (3) indicates significance at the 5% level. Hence, the results for CHILD*AGE_30 changed

according to different specifications. Thus, the effects of CHILD*AGE_30 are not considered to be robust. Columns (4)–(6) suggest that CHILD*AGE_40 is also positive and statistically significant at the 1% level. This indicates that the positive effect of CHILD*AGE_40 is robust according to alternative specifications.

Table 5 also shows the marginal effects of the interaction terms. The marginal effects of CHILD*AGE_30 in column (3) suggest that people aged over 30 years are 4% more likely to choose '4' (often watched anime) when they have an additional child aged under 12 years. Furthermore, they are 8% less likely to choose '1' (did not watch anime at all) when they have an additional child aged under 12 years. The marginal effects of CHILD*AGE_40 in column (6) suggest that people aged over 40 years are 8% more likely to choose '4' (often watched anime) when they have an additional child aged under 12 years. Furthermore, they are 15% less likely to choose '1' (did not watch anime at all) when they have an additional child aged under 12 years. Therefore, the marginal effects of CHILD*AGE_40 are approximately two times larger than those of CHILD*AGE_30. The results in Table 5 show that the externality of having young children has a larger positive effect on those parents belonging to a generation where in general people are less inclined to watch anime.

Thus, the interpreted estimation results strongly support the hypothesis proposed in Section 2. The joint consideration of the results presented in Tables 4 and 5 show people who do not usually watch anime will do so if they live with an anime fan.

### *4.2. Discussion*

Traditionally in Japan, anime and manga (Japanese comics) have been generally considered as entertainment for children rather than adults[10]. Furthermore, parents usually discourage their 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. That is, it is the influence of parents that acts to reduce the frequency of their children's anime viewing. In contrast, and what is made evident in this paper, is that the attitudes of parents have been influenced by their children and therefore changed. This might be in part because the quality of anime has improved recently, leading to a greater acceptance of the genre by adults. In the process of the development of Japan's modern cultural industry, some forms

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

of anime and manga are now very sophisticated and attract not only the interest of children but also of adults (Napier 2000). 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.

The number of adult fans of anime and manga has increased, creating a community known as *otaku* world. *Otaku* is a term given to people who only associate with their friends and who generally keep to themselves; that is, a person who is *otaku* is characterized as having an introverted personality. However, Japanese anime and manga have now become popular not only in Japan but also in Western countries. Thus, despite its origins, the concept of *otaku* world is now global. Various groups are now interested in Japanese contemporary culture and Japanese contemporary pop culture has been assigned the name "Cool Japan". Thus, it now possesses a positive image. Fans are now easily communicating with each other and their network appears to be open to outsiders. Hence, a huge demand for "Cool Japan" is anticipated and anime is therefore considered to be a promising industry that could trigger the revival of the Japanese economy.

In response to these changes, 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 so it is necessary to promote them further (MECSST, 2000)[11]. 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[12]. 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 known to be very fond of manga and recognizes its cultural value (Daily Yomiuri, 2008). 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

[11] 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).
[12] "Manga and anime museums have sprung up across Japan since the 1990s" (Daily Yomiuri, 2011).

capital influences 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 their parents to watch anime even if parents do not want to. Such an externality has, however, not been investigated by academic researchers. This paper explored how and the extent to which the presence of young children increases the frequency of their parents' viewing of anime.

Using an ordered probit model with individual-level data from Japan, it was found that people are more likely to watch anime when they have children under the age of 12 years who have not yet entered junior high school. 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 older parents even though people of older generations in general are less inclined to watch anime. This implies that parents can increase their utility level when they watch anime with their children even when parents do not prefer anime. Thus, socioeconomic factors such as the externalities within a family play a critical role in enlarging the market of modern cultural goods. This is thought to provide the clue to the spread of "Cool Japan" around the world.

Because of the limitation of the data, this paper concentrated 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 how there has been an increase in demand for Japanese anime in countries culturally and economically distinct from Japan. Furthermore, this study found the possibility of an influence between spouses. However, this observation has not been closely investigated. These remaining issues can be addressed in future studies.

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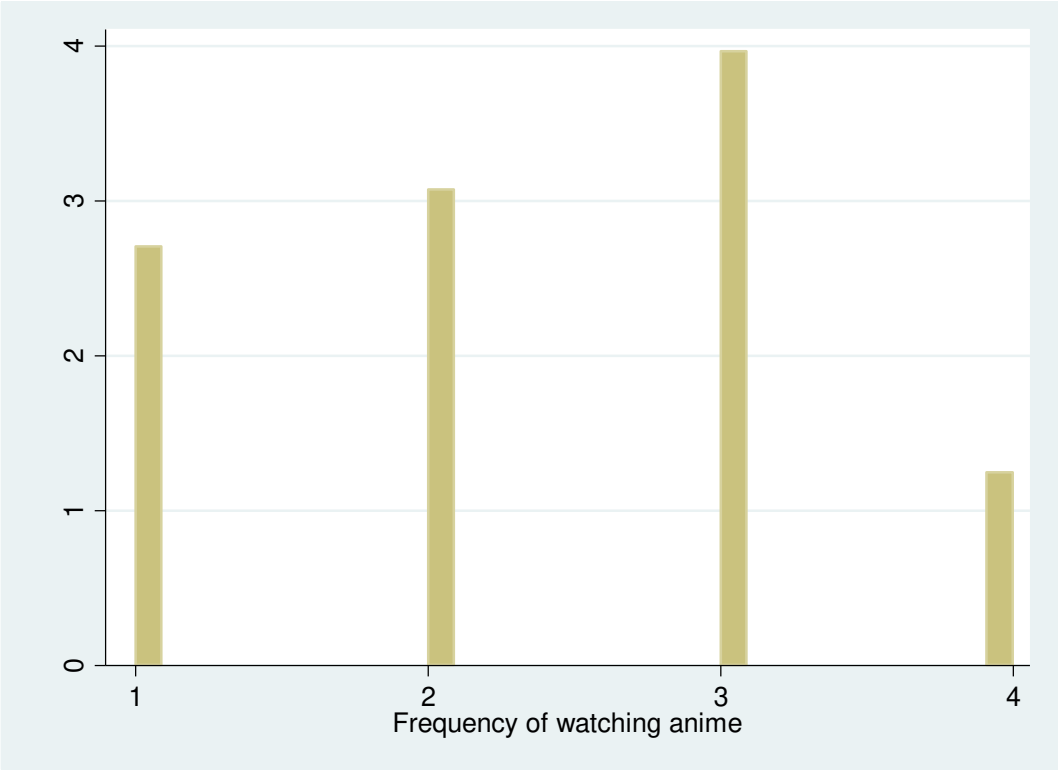


Figure 1. Distribution of views regarding viewing of anime

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)”.

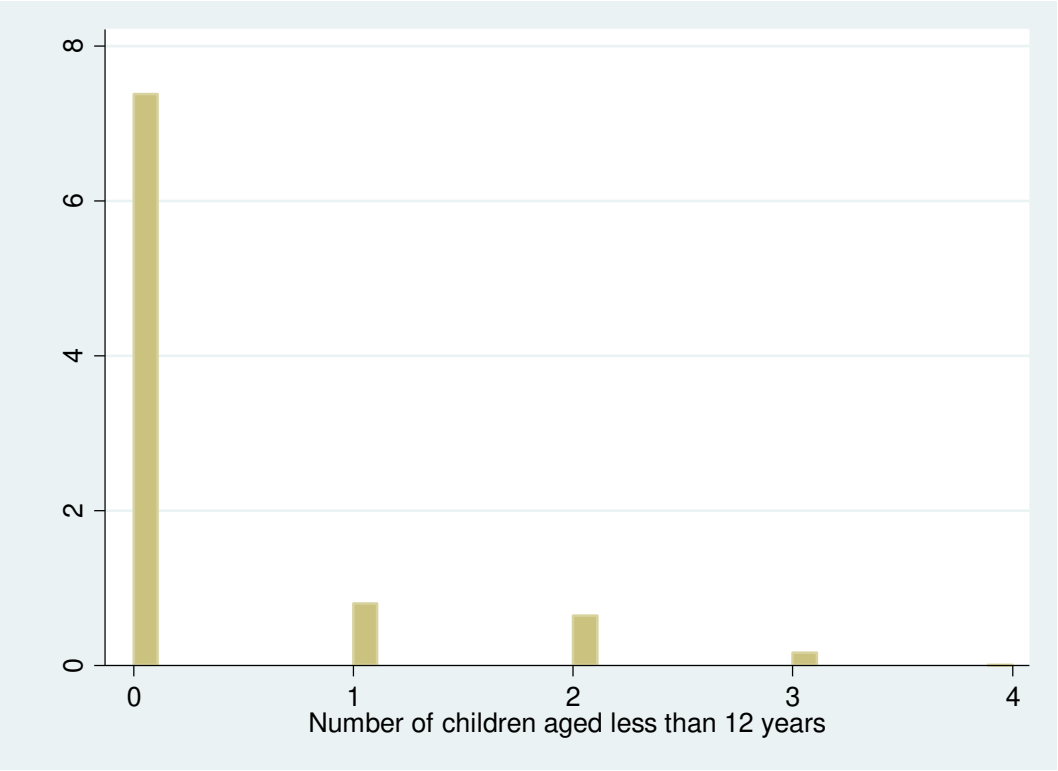


Figure 2. Distribution of respondents' children aged less than 12 years

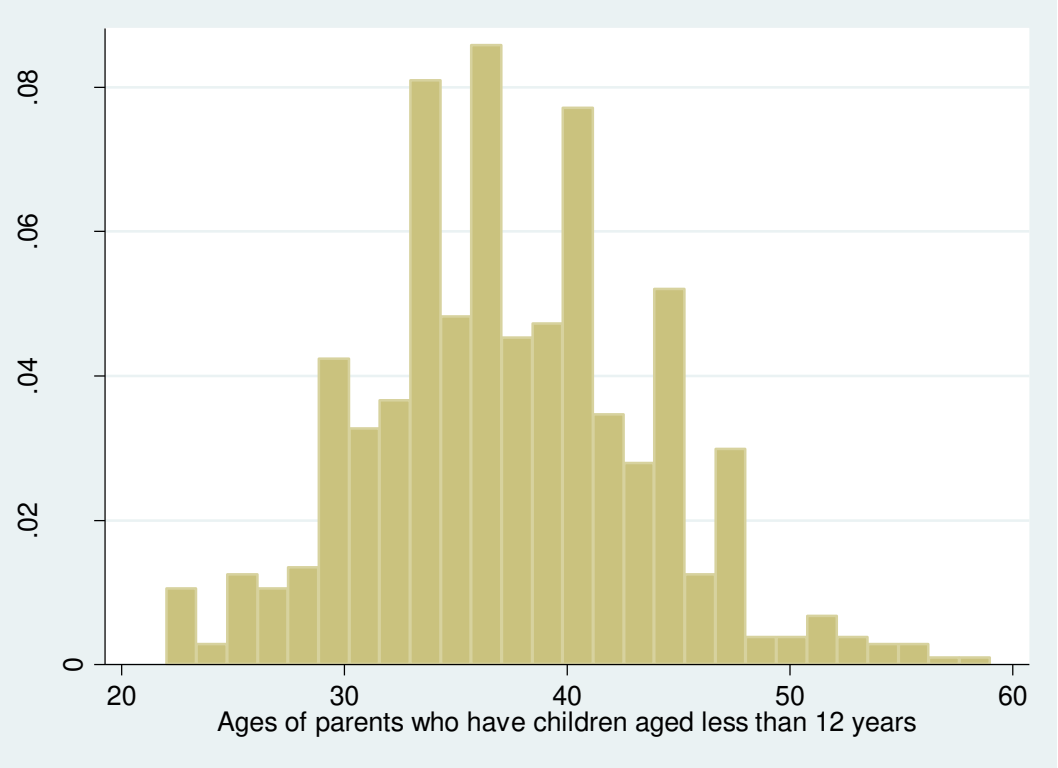


Figure 3. Distribution of respondents' ages who have children aged less than 12 years

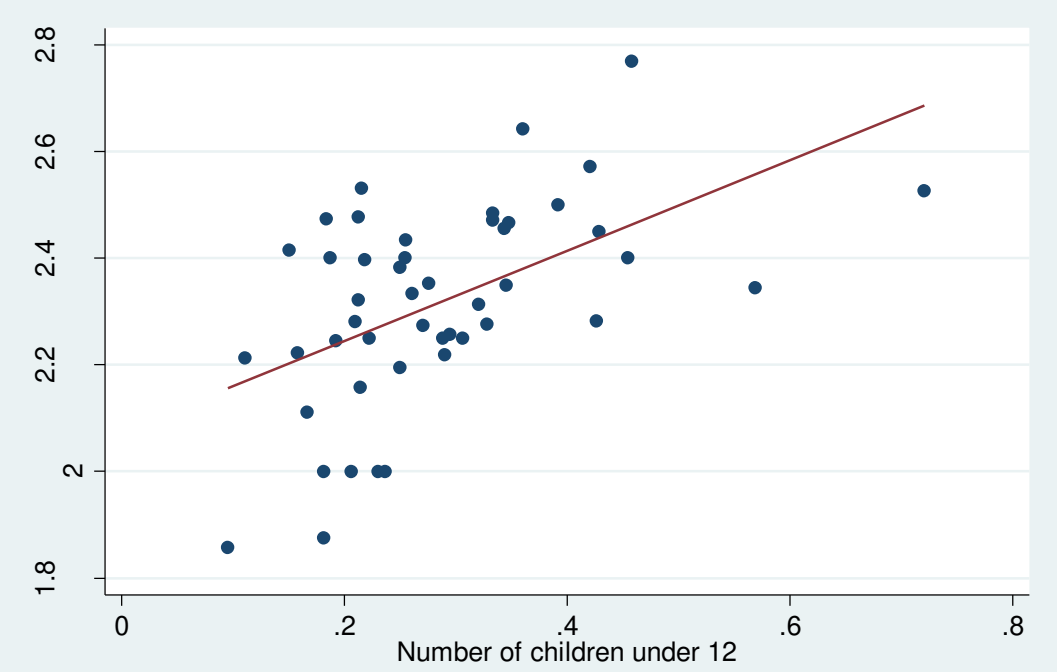


Figure 4. Association between number of children aged less than 12 years and frequency of watching anime

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_30 | Takes 1 if respondents are 30 years old and over, otherwise 0 | 0.96 | --- | 0 | 1 |
| AGE_40 | Takes 1 if respondents are 40 years old and over, otherwise 0 | 0.86 | --- | 0 | 1 |
| MALE | Takes 1 if respondents are male, otherwise 0 | 0.45 | --- | 0 | 1 |
| SCHOOL | Years of schooling | 12.5 | 2.46 | 6 | 18 |
| INCOME | Individual household income (million yen) | 0.58 | 0.40 | 0 | 2.3 |
| MARRY | Takes 1 if respondents are currently married, otherwise 0 | 0.85 | --- | 0 | 1 |
| WORKHR | Total working hours per week. | 23.6 | 23.1 | 0 | 98 |
| UNEMP | Takes 1 if respondents are currently unemployed, otherwise 0 | 0.01 | --- | 0 | 1 |

Note: Sample is the equivalent of those used in estimations for columns (1) and (4) of Table 3. Dummy variable takes 1 or 0; therefore its mean value can be interpreted as suggesting the rate of those who chose 1. Furthermore, the standard deviation of the dummy variable is not applicable and not reported.

Table 2. Mean difference test of ANIM (frequency of watching anime) between those who have children aged less than 12 years and those who do not

| | Full sample | 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 | 2.34<br>(2140) | 2.94<br>(378) | 2.21<br>(1762) | 13.9*** |
| Over 30 years versus under 30 years | | | | |
| Those who are 30 years old and over (a) | 2.26<br>(1894) | 2.93<br>(337) | 2.12<br>(1557) | 14.8*** |
| Those who are under 30 years old (b) | 2.91<br>(246) | 3.04<br>(41) | 2.88<br>(205) | 1.09 |
| Absolute t-value for mean difference test $H_0$: (a) – (b) = 0 | 10.0*** | 0.85 | 11.1*** | |
| Over 40 years versus under 40 years | | | | |
| Those who 40 years old and over (a) | 2.13<br>(1547) | 2.90<br>(123) | 2.06<br>(1424) | 9.77*** |
| Those who are under 40 years old (b) | 2.88<br>(593) | 2.96<br>(255) | 2.82<br>(338) | 2.06** |
| Absolute t-value for mean difference test $H_0$: (a) – (b) = 0 | 17.1*** | 0.75 | 13.8*** | |

Note: Numbers in parentheses are observations. ***,**,* indicate significance at the 1%, 5% and 10% levels, respectively.

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

| | ANIM | CHILD | AGE_30 | AGE_40 | MALE | SCHOOL | INCOME | MARRY | WORKHR | UNEMP |
|---|---|---|---|---|---|---|---|---|---|---|
| ANIM | 1.00 | | | | | | | | | |
| CHILD | 0.35 | 1.00 | | | | | | | | |
| AGE_30 | −0.14 | −0.17 | 1.00 | | | | | | | |
| AGE_40 | −0.30 | −0.64 | 0.37 | 1.00 | | | | | | |
| MALE | −0.05 | 0.02 | 0.03 | 0.03 | 1.00 | | | | | |
| SCHOOL | 0.17 | 0.17 | −0.05 | −0.15 | 0.12 | 1.00 | | | | |
| INCOME | 0.08 | 0.05 | 0.07 | 0.008 | 0.06 | 0.35 | 1.00 | | | |
| MARRY | 0.15 | 0.14 | -0.05 | −0.09 | 0.15 | 0.19 | 0.25 | 1.00 | | |
| WORKHR | 0.17 | 0.18 | -0.02 | −0.17 | 0.38 | 0.17 | 0.28 | 0.14 | 1.00 | |
| UNEMP | −0.03 | 0.01 | 0.02 | 0.01 | −0.01 | 0.01 | −0.03 | −0.03 | −0.10 | 1.00 |

Table 4. Baseline model; dependent variable is ANIM (ordered probit model)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| CHILD | 0.44*** | 0.45*** | 0.47*** | 0.36*** | 0.30*** | 0.28*** |
| | (9.75) | (11.7) | (13.8) | (5.79) | (6.82) | (7.92) |
| AGE_30 | –0.51*** | –0.66*** | –0.78*** | | | |
| | (–3.46) | (–7.30) | (–10.8) | | | |
| AGE_40 | | | | –0.29*** | –0.55*** | –0.72*** |
| | | | | (–2.82) | (–9.55) | (–13.9) |
| MALE | –0.34*** | –0.15*** | –0.08* | –0.33*** | –0.15*** | –0.10** |
| | (–5.69) | (–3.10) | (–1.64) | (–5.46) | (–3.14) | (–2.00) |
| SCHOOL | 0.05*** | 0.05*** | | 0.05*** | 0.05*** | |
| | (3.74) | (4.53) | | (3.68) | (4.14) | |
| INCOME | –0.07 | 0.06 | | –0.07 | 0.07 | |
| | (–0.80) | (0.90) | | (–0.79) | (1.10) | |
| MARRY | 0.33*** | | | 0.34*** | | |
| | (3.30) | | | (3.42) | | |
| WORKHR | 0.01*** | | | 0.01*** | | |
| | (5.07) | | | (4.60) | | |
| UNEMP | –0.19 | | | –0.20 | | |
| | (–0.50) | | | (–0.55) | | |
| **Marginal effect of CHILD** | | | | | | |
| ANIM (= 1) | –0.13*** | –0.13*** | –0.14*** | –0.11*** | –0.09*** | –0.08*** |
| | (–9.44) | (–10.6) | (–13.9) | (–5.63) | (–6.71) | (–8.09) |
| ANIM (= 2) | –0.03*** | –0.04*** | –0.04*** | –0.03*** | –0.03*** | –0.02*** |
| | (–7.13) | (–8.43) | (–9.22) | (–5.35) | (–6.08) | (–6.57) |
| ANIM (= 3) | 0.11*** | 0.10*** | 0.10*** | 0.09*** | 0.07*** | 0.06*** |
| | (8.74) | (9.66) | (11.9) | (5.56) | (6.61) | (7.51) |
| ANIM (= 4) | 0.06*** | 0.07*** | 0.08*** | 0.05*** | 0.04*** | 0.04*** |
| | (8.22) | (9.37) | (11.6) | (5.43) | (6.09) | (7.37) |
| Log pseudo-likelihood | –1593 | –1842 | –2674 | –1593 | –1834 | –2650 |
| Observations | 1317 | 1492 | 2140 | 1317 | 1492 | 2140 |

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. Model with interaction term; dependent variable is ANIM (ordered probit model)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| CHILD | 0.30* | 0.25** | 0.22** | 0.14* | 0.12** | 0.09** |
| | (1.78) | (2.08) | (2.32) | (1.80) | (2.23) | (2.20) |
| AGE_30 | –0.66*** | –0.75*** | –0.85*** | | | |
| | (–3.30) | (–7.23) | (–10.8) | | | |
| CHILD* AGE_30 | 0.15 | 0.21* | 0.27** | | | |
| | (0.84) | (1.65) | (2.46) | | | |
| AGE_40 | | | | -0.63*** | –0.77*** | –0.90*** |
| | | | | (-4.90) | (–11.5) | (–16.6) |
| CHILD* AGE_40 | | | | 0.43*** | 0.48*** | 0.53*** |
| | | | | (3.18) | (4.01) | (5.35) |
| MALE | –0.34*** | –0.16*** | –0.09* | –0.32*** | –0.17*** | –0.11** |
| | (–5.70) | (–3.17) | (–1.83) | (–5.38) | (–3.46) | (–2.41) |
| SCHOOL | 0.05*** | 0.05*** | | 0.04*** | 0.04*** | |
| | (3.70) | (4.49) | | (3.49) | (3.67) | |
| INCOME | –0.07 | 0.06 | | –0.06 | 0.08 | |
| | (–0.79) | (0.88) | | (–0.65) | (1.18) | |
| MARRY | 0.33*** | | | 0.34*** | | |
| | (3.29) | | | (3.50) | | |
| WORKHR | 0.01*** | | | 0.01*** | | |
| | (5.01) | | | (3.87) | | |
| UNEMP | –0.19 | | | –0.33 | | |
| | (–0.51) | | | (–0.90) | | |
| **Marginal effect of interaction term[a]** | | | | | | |
| ANIM (= 1) | –0.04 | –0.06* | –0.08** | –0.13*** | –0.14*** | –0.15*** |
| | (–0.84) | (–1.65) | (–2.46) | (–3.18) | (–4.00) | (–5.26) |
| ANIM (= 2) | –0.01 | –0.02* | –0.02** | –0.03*** | –0.04*** | –0.05*** |
| | (–0.83) | (–1.65) | (–2.39) | (–2.99) | (–3.83) | (–5.20) |
| ANIM (= 3) | 0.03 | 0.05 | 0.06** | 0.11*** | 0.11*** | 0.12*** |
| | (0.83) | (1.61) | (2.41) | (3.21) | (3.94) | (5.31) |
| ANIM (= 4) | 0.02 | 0.03* | 0.04** | 0.06*** | 0.07*** | 0.08*** |
| | (0.86) | (1.71) | (2.49) | (3.00) | (3.90) | (5.05) |
| Log pseudo-likelihood | –1593 | –1841 | –2671 | –1584 | –1821 | –2628 |
| Observations | 1317 | 1492 | 2140 | 1317 | 1492 | 2140 |

Note: (a) Marginal effect of interaction term between CHILD and AGE_30 is reported in columns (1)–(3), while marginal effect of interaction term between CHILD and AGE_40 is exhibited in columns (4)–(6).

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.