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Working Paper

The Effect of Grandchildren on the Happiness of Grandparents: Does the Grandparent's Child's Gender Matter?

IZA Discussion Papers, No. 14081

Provided in Cooperation with:

IZA – Institute of Labor Economics

Suggested Citation: Yamamura, Eiji; Brunello, Giorgio (2021) : The Effect of Grandchildren on the Happiness of Grandparents: Does the Grandparent's Child's Gender Matter?, IZA Discussion Papers, No. 14081, Institute of Labor Economics (IZA), Bonn

This Version is available at:

<https://hdl.handle.net/10419/232833>

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ISSN: 2365-9793

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ABSTRACT

The Effect of Grandchildren on the Happiness of Grandparents: Does the Grandparent's Child's Gender Matter?

Using a representative sample from Japan and a difference-in-differences strategy, we investigate whether the effect of having grandchildren on the happiness of grandparents varies with the gender of their (own) single child. In line with our expectations, we find that maternal grandmothers have more to lose or less to gain from having grandchildren than paternal grandmothers. In contrast, grandfathers' changes in happiness do not depend on their own child's gender. This result is explained by the fact that grandmothers are more likely to be involved in child-rearing when their daughter has a child.

JEL Classification: J13, J14, J16, I31

Keywords: grandparents, grandchildren, happiness, gender differences

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1. Introduction

Developed countries are rapidly becoming aging societies. With female labor participation being increasingly promoted, grandparents are often expected to contribute to the care of grandchildren (see Takaku 2019),¹ raising questions as to whether the latter contributes positively or negatively to the grandparents' wellbeing.

Recent empirical studies have explored the effects of grandchild care on grandparents' health status (Di Gessa et al. 2016a, 2016b; Ku et al. 2012; Reinkowski 2013), mortality (Christiansen 2014), participation in social activities (Arpino and Bordone 2017), and cognitive functioning (Ahn and Choi 2018).

An issue not considered so far is whether the relationship between the presence of grandchildren and the wellbeing of grandparents is significantly affected by the strength of inter-generational ties within a family.² The current study aims to fill this gap by focusing on Japan and by investigating whether the effect of grandchildren on grandmothers varies with whether it is their daughter vs their daughter-in-law who has a child.

This question is motivated by the observation that, because of the stronger ties between a mother and a daughter, maternal grandmothers in Japan are more

¹ Studies on the interaction between childcare from grandmothers and the labor supply of mothers include Posadas and Vidal-Fernández (2012), Aparicio-Fenoll and Vidal-Fernandez (2015), Ho (2015), Rupert and Zanella (2018), and Garcia-Moran and Kuehn (2018).

² An exception is Pushkar et al. (2014), who report that older parents of only daughters are more satisfied with life and have more intimate family relations than older childless adults and parents of only sons.

likely to be involved in the responsibilities of child-rearing than paternal grandmothers (Holloway 2010; Suzuki et al. 2009). Therefore, they are more exposed to the disadvantages of having grandchildren when their daughter has a child. In contrast, we expect no difference between the happiness of maternal and paternal grandfathers, because of their lesser involvement in child-rearing.³

We address this question by analyzing a sample of Japanese individuals aged 55 to 68 who have a single child, exploiting the fact that, for these generations, the assumption that the gender of the firstborn is random is plausible. We compare maternal and paternal grandmothers and show that the former have on average more to lose or less to gain than the latter in terms of happiness from having grandchildren. This is consistent with the observation that, in Japan, maternal grandmothers are more likely to bear the disadvantages of having grandchildren than paternal grandmothers. For grandfathers, we find that changes in happiness due to the presence of grandchildren do not vary with own child's gender.

The remainder of this paper is organized as follows: Section 2 presents a brief overview of family relations in contemporary Japan. Section 3 introduces the hypotheses to be tested, Section 4 describes the data, and Section 5 discusses the empirical approach. The results are presented in Section 6. Conclusions follow.

³ The gender difference in the time allocated to housework is well-known (for Japan, see Yamamura and Tsutsui (2021)) and also includes childcare (García-Mainar et al. 2011). After reaching retirement age, females typically increase their provision of grandchild care more than males (Feng and Zhang 2018).

2. Overview of contemporary family in Japan

In Japan, it is usual for the wife to spend more time on housework tasks than the husband does. This gap increases after childbirth (Yamamura and Tsutsui 2021), which can be explained by gender identity (Akerlof and Kranton 2000), because child-rearing is considered as housework and the province of the wife.

Vogel (1996) argued that Japanese mothers used to rely on other family and community members for child-rearing. Although the situation has changed due to the decline in the total fertility rate since the 1970s and the emergence of the nuclear family,⁴ family ties still play a crucial role in the help mothers receive in child-rearing.

Although Japanese mothers-in-law have traditionally been involved in the lives of their daughters-in-law, providing advice and support, their relationships with their daughters-in-law have often been strained. Holloway (2010), for instance, argues that “...virtually all the women whose mothers-in-law were still alive characterized the relationship as difficult. They perceived their in-laws as nosy and critical, rather than supportive. They did not feel that their in-laws appreciated or respected them, nor did they value their in-laws’ perspectives on child-rearing” (pp. 141–142). This suggests that mothers with small children

⁴ In the 1990s, the Japanese government implemented various policies to counteract the falling birthrate: the childcare market was deregulated, childcare centers were expanded by the Angel Plan, and additional childbirth grants were provided. Because of these policies, having a child did not discourage females from working (Lee and Lee 2014).

prefer their mothers to their mothers-in-law for support in child-rearing.

3. Hypotheses to be tested

Having grandchildren has both positive and negative effects. On the positive side, the presence of grandchildren can be rewarding and a source of higher satisfaction, and lead to more physical exercise and mental activity if care is involved, which improves grandparents' well-being (see Coall and Hertwig 2011; Powdthavee 2011; Silverstein et al. 2003).

On the negative side, caring for grandchildren also means additional responsibility and stress, which may harm grandparents' health and lead to depression, a reduction in leisure time, and alternative uses of time (see Minkler 1999). The balance between positive and negative effects is not clear a priori. Some researchers have found that the informal care of grandchildren has a negative effect on grandparents' mental health (Brunello and Rocco 2019, for Italy), while others have found that such care increases well-being (see Dunifon et al. 2020, for the United States; Powdthavee 2011, for the United Kingdom; Wang et al. 2019, for China).⁵

⁵ These differences could be because in countries such as Italy, the remarkably high rate of cohabitation of adults with their parents leads to more intensive involvement of grandparents in informal childcare, which causes the disadvantages of this care to be greater than the benefits (see Manacorda and Moretti 2006).

The benefits and disadvantages of having grandchildren are likely to vary by gender. In many societies, including Japan, grandmothers are more likely to be involved in informal care than grandfathers. In addition, grandfathers tend to pass the difficult and stressful components of childcare to grandmothers. This suggests that the disadvantages of having grandchildren may be greater for grandmothers than for grandfathers. However, because the benefits could sometimes also be greater, the overall effect cannot be determined a priori. Brunello and Rocco (2019), for instance, find that the negative effects of childcare on the mental health of grandparents are larger for grandfathers than for grandmothers.

In this paper, we suggest that the effect of grandchildren on the happiness of grandparents may vary not only with the gender of the grandparents but also with whether it is one's daughter or daughter-in-law who has a child, mainly because the relationship between a daughter (a son) and a mother is different from that between a daughter (a son) and a mother-in-law.

Our observations from Japanese society suggest that, on average, a) grandfathers are less likely to be involved in informal childcare than grandmothers; b) when it is their daughter who has the child, maternal grandmothers are more involved in informal childcare than paternal ones; and c) when it is their daughter-in-law who has the child, paternal grandmothers are less involved in informal childcare than maternal ones. Since higher involvement increases the disadvantages of childcare, points b) and c) imply that grandmothers are less likely to benefit from grandchildren when their

daughter has a child than when their daughter-in-law does.

Fig. 1 illustrates this network of weak (dashed lines) and strong (solid lines) relationships within the typical Japanese family. It suggests the following testable hypotheses:

H1) Grandmothers whose daughter has children benefit less (or lose more) in terms of happiness from having grandchildren than grandmothers whose daughter-in-law has children.

H2) For grandfathers, the net benefit from having grandchildren does not vary with whether it is their daughter or daughter-in-law who has the child.

4. Data

Our data are from an internet survey conducted in July 2016, 2017, and 2018 by the Nikkei Research Company, which has substantial experience in conducting academic surveys, on a representative sample of Japanese individuals aged 18 to 68.⁶

The data include information on individual self-reported happiness as well as on the number of children and grandchildren, and on individual characteristics, such as household income, individual education, and, importantly, the age of the youngest child. We focus on the 1,021 individuals aged 55 to 68 who had a

⁶ A 2015 government survey on the use of information technology indicates that over 90 percent of working-age Japanese are internet users. Therefore, the bias due to the exclusion of non-users is likely to be small. See the report from the Statistics Bureau, Ministry of Internal Affairs and Communications <http://www.soumu.go.jp/johotsusintokei/statistics/statistics05.html> (accessed on April 5, 2018).

single child.⁷ Of these, 19.5 percent had at least one grandchild.

Although we do not know the age of grandchildren, we know that, in 2017, the average age of their mothers at the first birth was 31 years (Ministry of Health, Labour, and Welfare 2017). Since, in our data, the 95 percentile of children's age is 39, we estimate that most grandchildren in our sample are aged less than 10.

Happiness is an ordinal variable that we obtain from the answers to the following question:

“Currently, to what degree are you feeling happy? On a scale from 1 to 5, where 5 is ‘very happy’ and 1 is ‘very unhappy,’ how would you rate your current level of happiness?”

The distribution of answers to this question was as follows: 4.9 percent of the respondents chose “1,” 9.8 percent “2,” 23 percent “3,” 38.2 percent “4,” and 24.1 percent “5.” Table 1 shows that the average happiness is 3.67, average age is 60.48, and average child's age is 28.92. The share of female children is slightly below 0.5 at 0.49; the share of married individuals is 64.2 percent, and 55.3 percent of the respondents have a college degree. The average household income is 6.09 million yen, the share of individuals with a high household income (above 10 million yen) is 16.3 percent, and 19.5 percent of the respondents have at least one grandchild.

⁷ We exclude the very few observations where the age gap between the grandparent and their own child is less than 18.

5. Empirical model specification

We evaluate hypotheses H1 and H2 using only grandparents with a single child, exploiting the fact that the gender of firstborns is approximately random. In principle, access to ultrasound technologies and abortion services can alter this fact by allowing parents to choose the sex of their children. In practice, however, the availability of these techniques was limited for the cohorts of grandparents considered in this study, who were aged 55 or older between 2016 and 2018 (see Cronqvist and Yu 2017).⁸

We estimate the following empirical model:

$$\begin{aligned} H_i = & \alpha_0 + \alpha_1 GC_i + \alpha_2 F_i + \alpha_3 D_i + \alpha_4 (GC_i \times F_i) + \alpha_5 (GC_i \times D_i) \\ & + \alpha_6 (GC_i \times F_i \times D_i) + \beta X_i + u_i \end{aligned} \quad (1)$$

where i denotes the i -th individual; H is individual happiness, an ordinal variable ranging from 1 to 5; GC is a dummy equal to 1 for the presence of grandchildren and 0, otherwise; and F is grandparents' gender ($F=1$ for grandmothers and $F=0$ for grandfathers). D is the child's gender ($D=1$ for daughters and $D=0$ for sons), and X is a vector of controls, which includes the individual's age, the child's age, educational attainment, household income, marital status, and job type.

Since the presence of grandchildren is not random, but the outcome of a choice, GC is correlated with the random error term u . In the absence of sources of

⁸ According to Baba (2012) and Natori (2012), the technology using three-dimensional ultrasonic images to observe the fetus was available as early as 1986. Its use, however, became widespread only in the 1990s.

exogenous variation, a consistent estimate of the effect of having a grandchild on individual happiness is not possible nor can we consistently estimate the gender difference in the effect of having a grandchild. In this study, we do not try to estimate these effects. Rather, more modestly, we exploit the randomness of the firstborn's gender to consistently estimate the difference in the effect of having a grandchild when the grandparent's child is female vs when he is male.

For a grandmother with a daughter, the expected happiness associated with having grandchildren is

$$E[H_i|F_i = 1, D_i = 1, GC_i = 1] = \sum_{j=0}^6 \alpha_j + E[u_i|F_i = 1, D_i = 1, GC_i = 1] \quad (2)$$

For a grandmother with a son, the expected happiness is

$$E[H_i|F_i = 1, D_i = 0, GC_i = 1] = \sum_{j=0}^2 \alpha_j + \alpha_4 + E[u_i|F_i = 1, D_i = 0, GC_i = 1] \quad (3)$$

The difference between (2) and (3) is

$$E[H_i|F_i = 1, D_i = 1, GC_i = 1] - E[H_i|F_i = 1, D_i = 0, GC_i = 1] = \alpha_3 + \alpha_5 + \alpha_6 \quad (4)$$

because

$$\{E[u_i|F_i = 1, D_i = 1, GC_i = 1] - E[u_i|F_i = 1, D_i = 0, GC_i = 1]\} = 0$$

when the child's gender is random.

Since the happiness of maternal and paternal grandmothers could differ even in the absence of grandchildren, we need to subtract from (4)

$$E[H_i|F_i = 1, D_i = 1, GC_i = 0] - E[H_i|F_i = 1, D_i = 0, GC_i = 0] = \alpha_3 \quad (5)$$

which yields

$$H1: \alpha_5 + \alpha_6 < 0$$

Using the same procedure, we find that hypothesis H2 for maternal and paternal grandfathers is given by

$$H2: \alpha_5 = 0$$

6. Results

First, we investigate whether a single child's gender can be considered as good as random by performing balancing tests, that is, by regressing the available covariates on the dummy D , controlling for year effects and for missing values dummies.⁹ Although our set of covariates is limited—it includes age, child's age, dummies for high education and income, marital status, and employment status—we find no evidence (see Table 2) that they are correlated with D , which supports our assumption.

We pre-processed our data to adjust the covariate distribution in the control group ($GC=0$) so that it became more similar to the covariate distribution in the treatment group ($GC=1$). For this purpose, we used entropy balancing (Hainmueller 2012).¹⁰ Table 3 shows the means and variances of the available covariates for the treatment and control groups, before and after weighting.

In the raw data, both grandparents and parents in the treatment group were older than those in the control group. Treated grandparents are also less educated and

⁹ There are missing values for the following variables: household income, marital status, employment status, and educational attainment.

¹⁰ Entropy balancing is a generalization of the propensity score weighting approach.

less likely to have a household income exceeding 10 million yen. These differences were eliminated in the weighted sample, which we used to estimate Eq. (1) by adopting either a linear or probit specification.

The results for the linear specification are reported in Table 4. We find that the value of the coefficient of the child's gender dummy is small (-0.01) and not statistically significant, suggesting that, in the absence of grandchildren, the gender of their child has no effect on the happiness of grandparents. In the presence of grandchildren, however, whether the grandparents' child is female or male matters for the grandmother, but not for the grandfather, as hypothesized above.

In particular, we find that H1: $\alpha_5 + \alpha_6 = -0.49$, negative and statistically different from zero at the 5 percent level of confidence (standard error: 0.23), and that H2: $\alpha_5 = 0.18$, not significantly different from zero (standard error: 0.26). When measured in terms of average happiness, the gap in the change in happiness for grandmothers with grandchildren from a daughter rather than a son is -13.3 percent (-0.49/3.67), a considerable amount. For grandfathers, this gap is much smaller (4.9 percent).

Recently, Schröder and Yitzhaki (2017) and Bond and Lang (2019) have shown that, when happiness is measured as an ordinal variable, the average ranking of observed happiness across groups can be arbitrarily reversed unless some unreasonably strong conditions are assumed. Chen et al. (2019) proposed addressing this problem using median rather than mean regressions. For probit

and logit models, the median and the mean are identical. Therefore, we create a binary variable that is equal to 1 when $H=5$ and 0, otherwise, and estimate a probit specification of Eq. (1).¹¹ The results in Table 5 confirm our qualitative results. We also find that H1: $\alpha_5 + \alpha_6 = -0.21$, negative and statistically significant at the one percent level of confidence (standard error: 0.09), and that H2: $\alpha_5 = 0.02$, not significantly different from zero (standard error: 0.13), in line with the previous results.

Conclusions

Japan is a developed East-Asian country with a cultural and social background that differs from that of Western societies. Using independently collected individual-level data, this paper shows that maternal grandmothers have more to lose or less to gain from having grandchildren than paternal grandmothers. In contrast, grandfathers' changes in happiness do not depend on their own child's gender. We have explained this result through the fact that maternal grandmothers have stronger ties with their daughters than with their sons, and, therefore, bear a higher burden of informal childcare, with negative effects.

Some may argue that the difficult relationship between women and their mothers-in-law is not found only in Japan (see, for instance, Chan and Elder 2000, for the US). Whether our results hold for other countries outside Japan is an interesting question that should be addressed in future research.

¹¹ This new variable has a mean of 0.241.

Acknowledgements

We would like to thank the anonymous reviewer for the insightful comments that resulted in a thorough revision, and Editage (www.editage.jp) for English language editing. This study was supported by a Grant-in-Aid for Scientific Research B (Grant No. 16H03628) from the Japan Society for the Promotion of Science.

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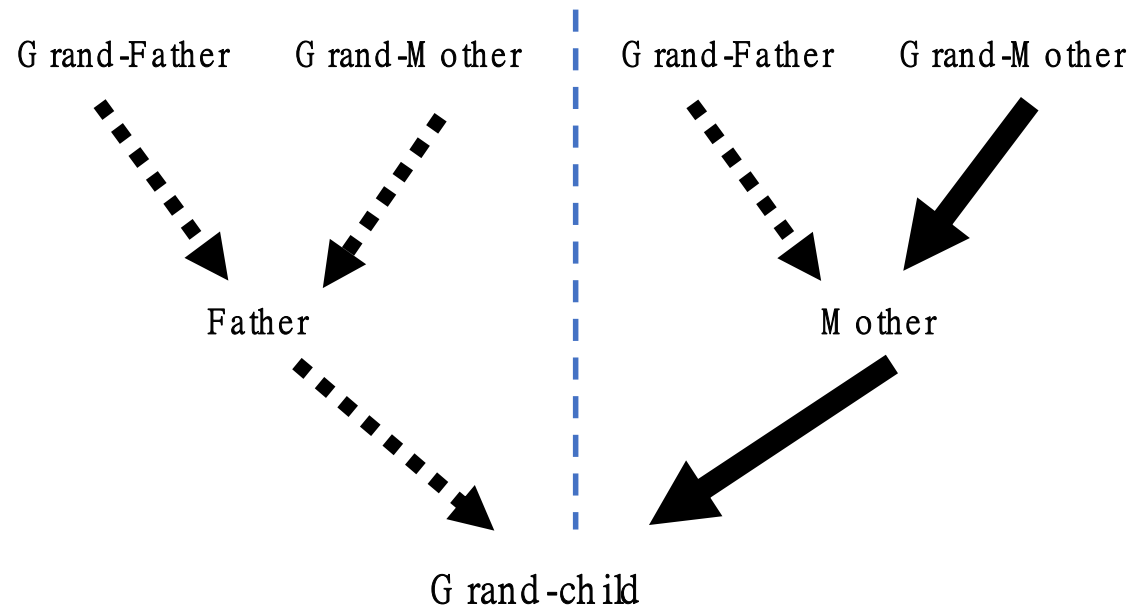


Figure 1. Strength of ties within the typical Japanese family.

Notes: dashed lines are for weaker ties and solid lines for stronger ties

Table 1. Summary statistics

	Mean	Standard deviation
Happiness level (1: lowest; 5: highest)	3.67	1.09
Have grandchildren (1: grandchildren; 0: otherwise)	0.19	0.39
Age	60.48	3.42
Child's age	28.92	6.37
Child's gender (0: male; 1: female)	0.49	0.50
Married (1: married; 0: otherwise)	0.64	0.48
Not employed (1: not employed; 0: otherwise)	0.23	0.42
Highly educated (1: college or more; 0: less than college)	0.55	0.49
High income (1: household income exceeds 10 million yen; 0: otherwise)	0.16	0.37
Average household income (million yen)	6.09	5.41

Table 2. Balancing tests

	Age	Parent's age	High education	High income	Married	Not employed
Child is female	-0.130 (0.21)	-0.40 (0.40)	0.02 (0.03)	-0.01 (0.02)	-0.01 (0.01)	-0.02 (0.02)
Number of observations	1,021	1,021	1,021	1,021	1,021	1,021
Time dummies	Y	Y	Y	Y	Y	Y
Missing values dummies	Y	Y	Y	Y	Y	Y

Note: Robust standard errors are in parentheses. One, two, and three asterisks indicate statistical significance at the 10%, 5%, and 1% levels, respectively. “Child is female” is set to 1 if the respondent’s only child is a daughter, and 0, otherwise.

Table 3. Covariates before and after entropy balancing

a. Before balancing

	Mean GC=1	Variance GC=1	Mean GC=0	Variance GC=0
Age	62.41	8.33	60.01	11.36
Child's age	34.62	21.68	27.54	34.51
Married	0.56	0.25	0.66	0.22
Not employed	0.25	0.19	0.23	0.18
Highly educated	0.44	0.25	0.58	0.24
High income	5.34	35.27	6.27	27.76

b. After balancing

	Mean GC=1	Variance GC=1	Mean GC=0	Variance GC=0
Age	62.41	8.33	62.40	8.33
Child's age	34.62	21.68	34.62	21.71
Married	0.57	0.25	0.57	0.25
Not employed	0.25	0.19	0.25	0.19
Highly educated	0.44	0.25	0.44	0.25
High income	0.28	0.20	0.45	0.25

Note: "GC" is equal to 1 if the respondent has grandchildren, and 0, otherwise.

Table 4. Weighted Ordinary least squares estimates using the weights generated by entropy balancing

	Coefficient	Standard error
α_1 Treatment (GC=1)	-0.38*	0.19
α_2 Female	-0.04	0.12
α_3 Child is female	-0.01	0.12
α_4 Female x treatment	0.56**	0.25
α_5 Female child x treatment	0.18	0.26
α_6 Female child x treatment x female	-0.67**	0.30
H1: $\alpha_5 + \alpha_6$	-0.49**	0.23
H2: α_5	0.18	0.26
Number of observations	1021	
R squared	0.027	

Note: Robust standard errors are in parentheses. One, two, and three asterisks indicate statistical significance at the 10%, 5%, and 1% levels, respectively. “Treatment” is 1 if the respondent has grandchildren, and 0, otherwise. “Female” is 1 if the respondent is female, and 0, otherwise. “Child is female” is 1 if the respondent’s child is a daughter, and 0, otherwise.

Table 5. Probit estimates using the weights generated by entropy balancing. Dependent variable: Probability that H=5. Marginal effects.

	Coefficient	Standard error
α_1 Treatment (GC=1)	-0.16*	0.09
α_2 Female	-0.02	0.06
α_3 Child is female	0.02	0.06
α_4 Female x treatment	0.33***	0.10
α_5 Female child x treatment	0.02	0.13
α_6 Female child x treatment x female	-0.23*	0.13
$H1: \alpha_5 + \alpha_6$	-0.21**	0.07
$H2: \alpha_5$	0.02	0.11
Number of observations	1,021	
Pseudo R squared	0.037	

Note: Robust standard errors are in parentheses. One, two, and three asterisks indicate statistical significance at the 10%, 5%, and 1% levels, respectively. “Treatment” is 1 if the respondent has grandchildren, and 0, otherwise. “Female” is 1 if the respondent is female, and 0, otherwise. “Child is female” is 1 if the respondent’s child is a daughter, and 0, otherwise.