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EDUCATION AND PRO-FAMILY ALTRUISTIC DISCRIMINATION AGAINST FOREIGNERS: FIVE-COUNTRY COMPARISONS

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Education and

pro-family altruistic discrimination against foreigners:

Five-country comparisons

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Abstract

We measure differences between altruism toward a family member and toward an unknown foreigner using hypothetical questions in internet surveys across five countries: Germany, the US, Singapore, South Korea, and Japan. Our analysis shows that people in all five countries exhibit greater altruistic tendencies toward family members compared to their behavior toward foreigners. However, the degree of discrimination differs across countries. It is lowest in Germany and largest in Japan; the remaining three countries fall within this demarcated range. Further analysis shows that correlation structures between education and altruistic discrimination differ widely. In Germany, people who have spent less time in education exhibit lower altruism toward foreigners compared to toward family members. However, in Japan, South Korea, and Singapore, people with higher education levels tend to discriminate against foreigners. The degree of discrimination is insensitive to the educational background in the US sample.

Keywords: Altruism, Attitude toward foreigners, Immigration, Education, Blinder-Oaxaca Decomposition
JEL classification: D64, F22, J01

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1. Introduction

Identity economics suggests that social identity, or group identity, facilitates cooperation within a group (Akerlof and Kranton 2010). When an individual belongs to a group and shares a social identity with members in that group, he/she acts altruistically toward them. This tendency is called "in-group favoritism." In contrast, that individual will tend to discriminate against another group's members ("out-group discrimination"). Several experiments have demonstrated that when a subject is paired with someone from the same group, thereby emphasizing their social identity, this promotes cooperative behaviors, including the provision of public goods (Kramer and Brewer 1984; Eckel and Grossman 2005; Charness et al. 2007; Chen and Xin Li 2009).

The boundaries between in-groups and out-groups are a function of gender, age, educational background, job classifications, race, religion, etc. When differences expand in terms of the altruism shown toward in-groups (more) and out-groups (less), social discrimination ensues, including gender, racial, and religious discrimination (Tajfel and Turner 1979).

This study focuses on social discrimination against foreigners, including racial and religious discrimination, and pro-in-group discrimination against foreigners that could be a function of these factors. Immigration is a politically, socially, and economically important issue in advanced countries, including redistribution and integration policies in those countries. This importance clearly manifests itself in recent events including the referendum in Great Britain, which decided that the country will leave the EU, and the anti-immigration rhetoric that was a hallmark of the Republican party's campaign trail in the lead-up to the recent US presidential election. If citizens in a country exhibit much lower altruism toward foreigners than familiar people, national governments could encounter difficulties in promoting policies that are open and inclusive, vis-à-vis immigration and foreign workers.[2]

Experimental studies in economics and psychology have measured levels of general altruism and in-group bias in several countries and discovered the existence of cross-country differences (Mann et al. 1985; Triandis et al. 1988; Engel 2011). However, it is still unclear whether pro-in-group altruistic discrimination exists against foreigners, how this type of discrimination varies across countries, and what determines each

[2] Recent empirical studies show that non-economic factors, including compositional concerns and altruism, explain citizens' attitudes towards immigrants and foreign workers. Interestingly, these non-economic factors contribute more to explaining attitudes than do concerns about economic impacts (Card et al., 2012; Hainmueller et al., 2015).

country's level of discrimination and its differences with other countries.

Related studies have been conducted by Jones and Rachlin (2006, 2009). They first measured "subjective social distance," which is equivalent to a feeling of closeness, for various other people. In addition, the authors paired a participant with recipients in different subjective social distances, conducted dictator games, and estimated altruistic parameters at each subjective social distance. Their results showed that as subjective social distance widens (feelings of closeness drop), the altruistic parameter decreases. Furthermore, Strombach et al. (2014) conducted similar experiments for university students in both Germany and China and showed that as subjective social distance widens, the altruistic parameter tends to decrease in both countries, but heterogeneities exist in terms of country-specific trends. These results could support the possible existence of pro-in-group altruistic discrimination against foreigners, and such discrimination could differ across countries, if we assume that we generally have a shorter subjective social distance for a familiar person and a longer one for a foreigner.

In this study, we use online questionnaire surveys with respondent samples diversified along the dimensions of gender, age, and state/county/prefecture in Germany, the US, Singapore, South Korea, and Japan. We create hypothetical questions by modifying Jones and Rachlin's questions for our purposes. In our questions, we pair a participant with a family member (this study defines an in-group member as a family member) and with an unknown foreigner, and measure the altruistic parameter toward each recipient. By subtracting the altruistic parameter toward a foreigner from that toward a family member, we calculate our measure of pro-family altruistic discrimination against foreigners.

Two main differences exist between previous experimental studies of social distance and this study. Firstly, the extant literature measures the altruistic parameter at a range of subjective social distances, while this study measures it for two objective targets, namely a family member and a foreigner. The previous models allow different subjective social distances and an identical degree of altruism to a foreigner among individuals. In contrast, the latter model allows different degrees of altruism to a foreigner among individuals. It should be noted that both types of models are theoretically isomorphic. However, in terms of measurements, subjective social distance in the previous literature does not have to include any foreigner when asking an experiment participant to mentally place people on the distance scale. Thus, the latter model is more suitable in the terms of measurements for our study's purposes of expanding the political discussion about discriminations against foreigners.

The second difference is that the previous literature reports experiments conducted among university students in some countries, while this study uses questionnaire surveys to gain data from samples diversified across the dimensions of gender, age, and state/county/prefecture of residence. This approach is utilized because it is suitable for our specific aims.

Adopting this methodology allows us to answer the following two research questions: (1) does pro-family altruistic discrimination exist against foreigners, and (2) how different is the altruistic discrimination between countries. Furthermore, we use question sets in our surveys and Blinder-Oaxaca decomposition methods (Blinder 1973; Oaxaca 1973) to determine the factors that explain cross-country differences in pro-family altruistic discrimination against foreigners. This analysis answers our third question: what determines each country's level of altruistic discrimination and what influences its cross-country differences.

The main findings are as follows. Firstly, pro-family altruistic discrimination does exist against foreigners in all five countries. Secondly, the degree of discrimination differs across countries. It is lowest in Germany and largest in Japan; the remaining three countries' degrees fall between these two extremes. Finally, the correlation structure between education and altruistic discrimination differs across countries. In Germany, people who have spent less time in education exhibit much lower altruism toward foreigners compared to that toward family members. In Japan, South Korea, and Singapore, people with higher education levels discriminate against foreigners. Interestingly, altruistic discrimination is insensitive to educational backgrounds in the US sample.

This paper is organized as follows. Section 2 introduces our methodology and data. Section 3 presents each country's level of altruistic discrimination. Section 4 discusses national differences as determined through the application of Blinder-Oaxaca decomposition analysis, and Section 5 discusses the study's implications, limitations, and areas for future research.

2. Methodology and data description

2.1. Overview

In this study, we conduct online questionnaire surveys[3] on samples diversified along the dimensions of gender, age, and state/county/prefecture for participants in Germany, the US, Singapore, South Korea, and Japan. We modify Jones and Rachlin's hypothetical questions for our purposes, analyze the responses, and measure pro-family altruistic discrimination against foreigners. In addition, we capture survey participants' socio-economic and demographic characteristics (gender, age, family structure, education, and household income[4]) and their personality, behavioral, and psychological characteristics (Big 5 personality traits, time preferences, and worldviews)[5].

Figures 1.1 and 1.2 posit two hypothetical questions. We use the answers from Figure 1.1 to measure the altruistic parameters toward a family member, and we use the answers from Figure 1.2 to measure the altruistic parameters toward an unknown foreigner. Next, by subtracting the latter from the former, we obtain our measure of pro-family altruistic discrimination against foreigners.

[Figures 1.1 and 1.2 are here]

In each question, we present eight situations in which participants have to choose Option 1 or Option 2. The choice requires participants to decide if the individual participant or a different recipient will receive a certain amount of money. For example, in Situation 4 of Figure 1.1, the choice is whether the participant receives 500 yen personally or their family member receives 7,500 yen. If the participants choose Option 1 in Situation 4, they have to relinquish Option 2, in which their family member could

[3] We asked research institutes in each country, including Nikkei Research Inc., to administer an internet-based survey in the official language of each country (restricted to English in Singapore, thus excluding Malay, Mandarin, and Tamil). We obtained 1,294 respondents in Germany, 1,283 respondents in the US, 1,290 respondents in Singapore, 1,284 respondents in South Korea, and 10,047 respondents in Japan. Furthermore, note that we conducted the Japan survey in 2013 and the others in 2014.

[4] We standardize household income by purchasing power parity for analytical consistency.

[5] Big 5 personality traits are frequently used to capture a respondent's conscientiousness, extraversion, agreeableness, openness to experience, and neuroticism. We measured the Big 5 Personality traits by using 10 short-phrase items developed by Gosling et al. (2003). The surveys in the US and Singapore directly used their query expressions. The surveys in Germany, Singapore, and Japan used those translated, respectively, by Muck et al. (2007), Ha et al. (2013), and Oshio et al. (2012).

Time preference implies a tendency to avoid a choice, which generates current costs and future benefits. Also, worldviews are defined as people's perceptions of how the world works.

have received 7,500 yen.

We calculate altruistic parameters using the following approach. We first take the average of the two monetary amounts[6] for Option 1 at the point of switching from Option 2 to Option 1, and we divide the numerator by 7,500 yen. For example, if a participant switches from Option 2 to Option 1 between Situations 4 and 5, we look at the two monetary amounts offered under Option 1, which are 500 yen and 1,000 yen. Then, we add these two amounts, take the average amount, which is 750 yen, divide the average amount by 7,500 yen, and calculate the amount of 0.100. We call this the log-normalized amount of our altruistic parameter.

We calculate our measure of pro-family altruistic discrimination against foreigners by subtracting the altruistic parameter toward the latter from the former. When altruistic discrimination takes a positive value, the altruistic parameter toward a family member is larger than that toward a foreigner.[7] The nearer this figure is to zero, the more the altruistic parameters toward family members and foreigners converge.

2.2. Methodological validity

We create hypothetical questions by modifying experimental designs by Jones and Rachlin (2006, 2008). Those authors adopted a Multiple Price List format,[8] conducted dictator games with different allocation patterns between a dictator and recipient, and estimated altruistic parameters for recipients. As shown in Figures 1.1 and 1.2, we also present multiple dictator games with different allocation patterns.

One of the main differences between their experimental designs and our questions is that the former measures the altruistic parameter at each subjective social distance, while our study measures it for two objective targets, namely a family member and a foreigner. As explained in the Introduction, this reflects the fact that our study's aim is to use our measure of pro-family altruistic discrimination against foreigners to explore the political implications of social discriminations against foreigners.

Our methodology is associated with certain concerns and potential limitations.

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[6] Switching points on boundaries were calculated as follows. If a participant chooses Option 1 in all eight situations, we define the switching point as the middle point between - 10 yen and 0 yen. On the other hand, if a participant chooses Option 2 in all eight situations, we define it as the middle point between 9,000 yen and 10,800 yen.

[7] When the amount is a negative value, the altruistic parameter toward a family member is smaller than that toward a foreigner. Such 'pro-foreigner altruistic discrimination against family members' rarely occurs in practice.

[8] The Multiple Price List methodology has been frequently used in laboratory experiments and questionnaire surveys when seeking to elicit time and risk preferences (Andersen et al., 2006).

The first concern is whether experimental outcomes with monetary incentives differ from those offering only hypothetical incentives. However, Locey, Jones, and Rachlin (2011) already determined that no statistically significant difference exists between the two. This tendency is found also in experimental studies on time preferences (Madden et al. 2003). Given these experimental results, we think that our hypothetical questions can be used for our study's purposes.

A second concern is whether the Multiple Price List format introduces errors (or bias) in participants' answers, because it repeatedly presents similar situations and could impose a strain on the participants. To address this concern, we adopt a titration methodology, which presents the least number of situations necessary to capture a participant's switching point from Option 2 to Option 1. The titration method has often been used in economics (Read et al., 2005; Linardi and Tanaka, 2013; Krupka and Stephens, 2013), psychology (Weber et al., 2007), and marketing (Zauberman, 2003). However, this method requires us to assume that after a participant's choice switches from Option 2 to Option1, he/she will definitely continue to choose Option 1 in all subsequent presented situations.

Third, some might debate whether our hypothetical questions elicit only altruism toward each recipient. Indeed, reasonable concerns exist that our measurement could capture additional phenomena aside from altruism toward family members and foreigners. Ida and Ogawa (2012) advanced a relevant argument; they pointed out that the parameters of Jones and Rachlin (2006, 2008) can consist of different altruistic parameters toward different recipients and a common inequality-aversion parameter[9] across all recipients; using conjoint analysis with hypothetical questions, they empirically determined the existence of the latter.

Importantly, their model indicates that we can remove this common inequality-aversion parameter by subtracting Jones and Rachlin's parameter toward one recipient from another recipient.[10] Accordingly, this study subtracts this parameter toward a foreigner from that toward a family member. This captures only differences in

[9] Inequality aversion implies a tendency to avoid inequalities between a dictator and a recipient. Bartling et al. (2009) differentiate several kinds of inequalities, which are aheadness aversion (aversion to positive payoff inequality), behindness aversion (aversion to negative payoff inequality), etc. Ida and Ogawa (2012) call the former inequality aversion and call the latter envy.

[10] Based on Ida and Ogawa (2012), we assume the following utility function:

$$U_{i(x)} = \log x_i + \theta_{i,j} \log x_j - \alpha_i \log \max\{(x_j - x_i) + 1, 1\} - \beta_i \log \max\{(x_i - x_j) + 1, 1\}$$

where x_i (x_j) denotes the vector of monetary payoff for a dictator i (a recipient j), and θ is the parameter of altruism, which can vary across different recipients. In equality aversions, α is the parameter of behindness aversion and β is the parameter of aheadness aversion. These parameters are common across different recipients.

altruism between the two.

Finally, others might question our definition of a family member as an in-group member. Several empirical studies have shown that people generally hold a strong feeling of closeness toward family members (Jones and Rachlin, 2006, 2009; Strombach et al., 2014). Therefore, our in-group assumption is plausible. However, since differences exist in family structures and relationships across countries and cultures, some people in some countries might not recognize a family member as an in-group member. To militate against this concern, our empirical model includes members in a respondent's current household.[11] Differences in current household members should consider cross-country differences in family structures and relationships.

2.3. Data description

[Table 1 is here]

Table 1 presents descriptive statistics. The data are obtained from internet surveys. Internet surveys have several advantages, including lower research costs (Fricker and Schonlau, 2002); some recent important economic studies have used them in place of interviews and mail surveys (Benjamin et al. 2014; Kuziemko et al. 2015). On the other hand, concerns have been raised regarding the extent to which internet samples depart from nationally representative samples and therefore, the extent to which data derived from internet surveys are biased.

To address these concerns, we first use sampling information provided by the aforementioned research institutes,[12] construct sample weights, and modify the distribution of our samples accordingly using those weights. Table 1 shows that the distributions of gender and age are indifferent between our samples and census data. However, some differences might exist in family structures, educational year, and household income.[13]

Second, our estimation model includes variables of personality and behavioral characteristics as covariates. We do so to control potential deviations in

[11] Our surveys identify respondent' current household members in detail (single or spouse, children, children's spouse, grandchildren, grandfather, grandmother, father, mother, spouse's father, spouse's mother, siblings, and others).

[12] Again, the research institute diversified samples along the dimensions of gender, age, and state/county/prefecture in the five countries.

[13] The education variable is based on the educational system in each country. We report each country's educational background and years in education in Appendix A.

psychological endowments and characteristics between our samples and the census data. However, even if some deviations and biases exist in our samples and subsequent survey answers, and even if these deviations and biases are similarly present in each country's sample, this does not crucially influence our cross-country comparative analysis.

3. Cross-country comparisons of pro-family altruistic discrimination against foreigners

[Figure 2 is here]

[Table 2 is here]

$$Altruistic\ Discrimination_i = \beta_1 US_i + \beta_2 DE_i + \beta_3 SG_i + \beta_4 SK_i + \beta_5 JP_i + Z_i'\delta + u_i \quad (1)$$

This section examines the results shown in Figure 2 and Table 2, addressing the following questions:

1. Does pro-family altruistic discrimination exist against foreigners?
2. If such discrimination does exist, how does it differ across countries?

Figure 2 depicts levels of pro-family altruistic discrimination against foreigners in the five sampled countries: Germany, the US, Singapore, South Korea, and Japan. In Table 2, we use model (1) to regress the dependent variable (altruistic discrimination) on countries' dummies in addition to socio-economic and demographic variables (gender, age, family structure, educational year, and household income) and personality and behavioral variables (Big 5 personality traits, time preference, and worldviews). Our regression analysis uses sample weights to consider differences in sample sizes across the five countries, and uses cluster-robust standard errors at state, county, or prefecture levels.

Before presenting the estimated results, we will summarize the method used to interpret the dependent variable. We calculate pro-family altruistic discrimination against foreigners by subtracting the altruistic parameter toward the latter from that of the former. When altruistic discrimination takes a positive value, the altruistic parameter toward a family member is larger than that toward a foreigner. As the discrimination value approaches zero, the altruistic parameters associated with family members and foreigners increasingly converge.[14]

The estimated results suggest that pro-family altruistic discrimination against

[14] With respect to some participants, the altruistic parameter toward a family member is lower than that toward a foreigner. However, this is not commonly observed. Excluding such observations and re-running the regression analysis, produces results which are near-identical to those discussed in this section.

foreigners exists in all five countries. According to Figure 2 and column 1 of Table 2, altruistic discrimination values are as follows: 0.310 (Germany), 0.386 (the US), 0.390 (Singapore), 0.381 (South Korea), and 0.434 (Japan). Column 1 also illustrates that all country dummy coefficients are positive and statistically significant at the 1% level. Clearly, people across all five sampled countries exhibit lower levels of altruism toward foreigners compared to that toward family members.

The results also reveal cross-country differences in altruistic discrimination. We reject, at the 1% level, the null hypothesis that German altruistic discrimination is not different from that in the other four countries, and that Japanese altruistic discrimination is not different from that in the other four countries. Pro-family altruistic discrimination against foreigners is lowest in Germany but greatest in Japan; the remaining three countries fall between these two countries in this respect.

Socio-economic and demographic characteristics explain to some degree each country's level of altruistic discrimination. Column 2 of Table 2 shows that when adding such variables to the model, country dummies become significant, but the countries' effects become smaller than those in column 1. Furthermore, column 3 shows that even after adding personality and behavioral variables to the model, the effect sizes remain similar to those in column 2, and the country ranks in terms of altruistic discrimination do not differ from those in columns 1 and 2. These results nullify the idea that altruistic discrimination is strongly influenced by systematic deviations in psychological endowments and characteristics between our samples and the census data.

One remaining concern[15] is that our survey respondents include non-natives in each country. If the ratio of non-natives in the sampled German respondents is higher than that in the other countries, it could conceivably explain the lower pro-family altruistic discrimination against foreigners there. This is because such non-native German residents might consider "foreigners" as native German neighbors, to whom they feel closeness as a result. In fact, the ratio of foreign-born residents to the total German population is 14.9%, which is relatively high compared to the ratio in other sampled countries (United Nations Population Division, 2017).

To address this concern, we incorporate the ratio of foreign-born residents by

[15] Another potential concern is that our survey procedure may serve to artificially decrease pro-family altruistic discrimination against foreigners in Germany, the US, Singapore, and South Korea. We, Japanese researchers, conducted the survey, and specify the nature of its content when recruiting respondents. Thus, respondents in the four other countries could be relatively favorable towards foreigners, including Japanese people. However, if so, there should exist little difference in altruistic discrimination across the four countries; therefore, we judge that this concern is not crucial for our analysis.

state/county/prefecture in the model. Appendix B shows that the directionality of the country dummies' parameters and their relative rank are insensitive to this model addition. Interestingly, the ratio of foreign-born residents has a negative effect on altruistic discrimination. This implies that when respondents live in areas with higher ratios of foreign-born residents, they will be more likely to exhibit lower pro-family altruistic discrimination against foreigners. Again, this could be because a respondent is a non-native.

The forgoing analysis addresses our two research objectives, namely (1) whether pro-family altruistic discrimination exists against foreigners, and (2) assessment of cross-country differences in altruistic discrimination. In terms of the former, altruistic discrimination exists the world over, and altruism toward foreigners is lower than that exhibited toward family members. In terms of the latter, altruistic discrimination differs across countries; altruistic discrimination is lowest in Germany and highest in Japan. That is, altruism exhibited toward foreigners is relatively similar (low) to that exhibited toward family members in Germany (Japan).

4. Blinder-Oaxaca decomposition analysis

Table 3 demonstrates that pro-family altruistic discrimination against foreigners is lowest in Germany but highest in Japan, with the remaining three countries' falling within the range set by these two extremes.

[Table 3 is here]

It therefore remains to determine what factors determine each country's level of altruistic discrimination and what, in turn, influences cross-country differences. This section uses Blinder-Oaxaca decomposition methods (Blinder 1973; Oaxaca 1973) to answer these questions. We focus on the results of the Japan–Germany comparison in this section because German (Japanese) altruistic discrimination is lowest (highest) and stable. We present further comparisons in Appendix C. The method used is

$$\overline{Altruistic\ Discrimination}^{JP} - \overline{Altruistic\ Discrimination}^{DE} = (\bar{X}^{JP} - \bar{X}^{DE})'\hat{\beta}^{DE} + \bar{X}^{DE'}\left(\hat{\beta}^{JP} - \hat{\beta}^{DE}\right) + (\bar{X}^{JP} - \bar{X}^{DE})'\left(\hat{\beta}^{JP} - \hat{\beta}^{DE}\right) \quad (2)$$

Before presenting our comparative results, we will briefly explain Blinder-Oaxaca decomposition methods. Model (2) shows that Blinder-Oaxaca decomposition methods entail conducting a regression analysis on each country's sample, the results of which are used to decompose a two-country difference in the dependent variable into endowment effects, coefficient effects, and interaction effects. Endowment effects refer to how the distributional differences in independent variables explain the two-country difference in the dependent variable. Coefficient effects denote how independent-variable coefficient differences explain the latter. In addition, interaction effects equal the other effects with the exception of endowments and coefficients effects. Here if a coefficient effect is statistically significant and independent variables are exogenous, causal effects differ between the two countries. Conversely, if independent variables are endogenous, a coefficient effect implies differences in correlation structures between the dependent and independent variables. Both of these cases contribute to discovering international differences in altruistic discrimination and correlated variables.

4.1. Japan–Germany comparison

[Table 4 is here]

Table 4 indicates that the Japanese–German differences in altruistic discrimination (0.125) can be explained mainly by differences in directionality and coefficient magnitudes. Panel A reports that the overall endowment effect is 0.022 (at 10%significance level) and the overall coefficient effect is 0.106 (at 1% significance level). In contrast, the overall interaction effect is not statistically significant. The coefficient effect is equivalent to around 84.8% of the two-country difference in the dependent variable.

We also find that most of the coefficient effect is associated with years in education, and this variable can be endogenous. According to column 2 of Panel A, the coefficient effect consists of three socio-economic and demographic variables: years in education, household income, and a female dummy. Years in educational and household income can be endogenous, and this result implies that differences exist in the correlation structures between altruistic discrimination and years in education/household income. In contrast, the female dummy is more exogenous. Therefore, its coefficient effect means that causal effects of being female differ between Japan and Germany, and this difference partly explains the two-country difference in the dependent variable.

We examine how the correlation structures of altruistic discrimination and years in education differ between Japan and Germany[16,17] because the coefficient effect of educational year is 0.120, so its effect is larger than the overall coefficient effect (0.106). Panel B shows that there exists a positive (negative) correlation between the two in Japan (Germany). Japan's correlation coefficient is 0.003 (at 5% significance level), and that associated with Germany is −0.006 (at 1% significance level). These

[16] The correlation structure between altruistic discrimination and household income is equivalent to the educational year case. Panel B shows that a positive correlation exists between the two in Japan; the correlation coefficient is 0.0002 (at 5% level). Conversely, a negative correlation exists in Germany; the correlation coefficient is −0.0004 at 10% significance level. That is, Japanese people with higher household incomes exhibit lower altruism toward foreigners compared to that toward family members, whereas German people with higher household incomes exhibit more equal levels of altruism towards these two groups.

[17] How different are the causal effects of being female between Japan and Germany? Panel B presents the coefficients and standard errors of these three variables from the regression results pertaining to each country's sample. In Japan, the female dummy has a statistically insignificant effect on the dependent variable. Conversely, in Germany, the dummy has a negative causal effect. That is, German females act altruistically toward foreigners, in contrast to the behavior of Japanese females.

results imply that Japanese people who have spent a longer amount of time in education exhibit lower altruism toward foreigners compared to family members, and that German people who have spent a longer amount of time in education exhibit more equal levels of altruism toward the former compared to the latter.

We also explore the coefficient effect for years in education. Since differences in educational systems exist between Japan and Germany, the correlation structures between altruistic discrimination and education could differ non-linearly, rather than linearly. To consider cross-country differences in educational systems, we replace the single educational year variable with dummy variables of educational background, which we use instead to conduct regression analysis in each country's sample.

[Tables 5.1 and 5.2 are here]

Japanese altruistic discrimination is highest among people with a Master's degree and higher. Table 5.1 shows that when setting the dummy of high school or less as a baseline, the junior college coefficient is statistically insignificant. In contrast, the coefficients on a bachelor's degree and Master's degree and higher are statistically significant and positive. In particular, the coefficient on a Master's degree and higher is the largest and statistically significant at the 1% level. These results indicate that Japanese people with Master's degrees or higher exhibit much lower altruism toward foreigners compared to that toward family members.

On the other hand, German altruistic discrimination is largest among people with elementary, intermediate, and high intermediate vocational education levels (called Hauptschule, Realschule, and Berfsschule, respectively). Table 5.2 shows that when setting the dummy variable of Realschule as a baseline, the coefficients of Hauptschule and Berfsschule are insignificant. In contrast, the coefficients of advanced vocational and higher general educations (Fachoberschule and universities) are negative at a 1~5% significance level. These results indicate that German people with elementary, intermediate, and high intermediate vocational education levels exhibit much lower altruism toward foreigners than toward family members.

The main finding is upheld that the correlation structures between altruistic discrimination and education differ widely across Japan and Germany. Japanese people who have spent a longer amount of time in education exhibit much lower altruism toward foreigners compared to their behavior toward family members. In contrast, German people who have spent less time in education exhibit much lower altruism

toward foreigners compared to that expressed toward family members. The estimation results with the linear education variable approximating those found using the dummy variables of educational background. Concretely, Japanese people with a Master's degree or higher exhibit greater pro-family altruistic discrimination against foreigners, while in Germany, this behavior is more prevalent among people with elementary, intermediate, and high intermediate vocational educations.

Appendix C shows that the correlation structures in South Korea and Singapore are similar to that of Japan, i.e., in South Korea and Singapore, people with a Master's degree and higher tend to discriminate against foreigners. Interestingly, in the US, altruistic discrimination is insensitive to educational background.

4.2. Education and pro-family altruistic discrimination against foreigners

This section explores the findings regarding education level in more detail, with an aim to determine why correlation structures differ across Japan and Germany. Three possible explanations exist. First, causal effects of receiving higher education vary between the two countries. Possibly, Japan's higher education (university and professional education) might serve to increase discrimination against foreigners, while Germany's might promote altruism toward non-nationals. Secondly, people exhibiting lower altruism toward foreigners might tend to enter higher educational institutes in Japan, and vice versa in Germany. In this explanatory paradigm, sample selection might be more important. Third, people with a higher education might be more competitive with immigrants and foreign workers in Japan, while people with a lower education are more competitive with them in Germany. That is, characteristics of labor market environments might shape pro-family altruistic discrimination against foreigners.

We show that we cannot dismiss the third explanation to the extent it has been dismissed by previous literature and evidence. However, similarly, we also fail to reject the first or second explanations.[18]

There is indirect evidence to suggest that Japanese nationals with a higher education are more competitive with foreign workers having a similar level of education. First, the ratio of foreign-born residents in the total population of Japan has been, and

[18] Our data does not contain instruments to elicit a causal effect from higher education on altruistic discrimination. Therefore, we cannot test whether the first and second explanations are reasonable.

continues to be, small. Rather, Japan faced a dramatic increase in population after World War II, and the government encouraged native workers to find work abroad. Second, non-native workers could have zero or marginal impacts on the wages and employment of Japanese workers. Nakamura et al. (2009) empirically illuminate that an increase in foreign labor force does not decrease Japanese native workers' wages, but rather, it increases the wages of high school graduates in Japan. These observations support the notion that Japanese workers with a lower education are less competitive with foreign workers.

Recently, a larger number of foreign experts with high skills have migrated to Japan. Japan has recently faced a severe decrease in population, and the government has intervened to encourage and accept foreign experts with high skills (Hayakawa, 2015). Machikita (2015) showed that these experts are employed in non-manufacturing industries, including information technologies and commercial trades. This supports the idea that Japanese workers with a higher education are more competitive with foreign workers in these non-manufacturing industries.

We also find some indirect evidence suggesting that German natives with a lower education are more competitive with foreign workers having a similar education level. First, the ratio of foreign-born residents in the total population is quite large, and their average education is relatively low. This is because Germany accepted a large number of immigrants from Turkey and other countries in their reconstruction process following World War II. Most of these immigrants settled in Germany, along with their families. Second, foreign workers with a lower education could have significant impacts on the wages or employment of native workers with similar education levels. Brücker et al. (2014) offer empirical evidence suggesting that accepting immigrants causes unemployment among German people with lower incomes.

These factors provide one reasonable pathway to explain the observed Japan–Germany differences in the correlation structures between altruistic discrimination and education. In Appendix C, South Korea's and Singapore's histories show the possibility that people with a higher education could be competitive with foreign workers, similar to observations in Japan.

5. Discussion, implications, limitations, and future research

This study assesses the differences in altruism between a family member and an unknown foreigner as measured using hypothetical questions in internet surveys completed by respondents in Germany, the US, Singapore, South Korea, and Japan. Our cross-country analysis answers the following three questions:

1. Does pro-family altruistic discrimination against foreigners?
2. What is the extent of cross-country differences in altruistic discrimination?
3. What determines each country's level of altruistic discrimination and what influences its cross-country differences?

The main answers to the first and second questions are as follows. First, we found that altruistic discrimination exists in all five countries, and the degree of discrimination differs across these countries. Specifically, the degree of discrimination is lowest in Germany and highest in Japan; the remaining three countries' fall within the range demarcated by these two countries.

These findings are consistent with those in the related literature. Strombach et al. (2014) estimated altruistic parameters at each social distance (a feeling of closeness) both in Germany and China. With respect to their German subjects, their findings showed that if a paired recipient was switched from an in-group member to an out-group member, the German subjects' altruism drops moderately. In contrast, the same configuration with Chinese subjects was associated with a more substantive drop in altruism compared to the German case.

Regarding the third question, the correlation structures of altruistic discrimination and education differ widely across the five countries. In Germany, people with fewer years in education exhibit much lower altruism toward foreigners compared to that exhibited toward family members. In Japan, South Korea, and Singapore, people who have spent longer in education tend to discriminate against foreigners. In an interesting departure, altruistic discrimination is indifferent across educational backgrounds in the US.

The findings with respect to Germany are consistent with the extant literature. It has been established that the more-educated natives of that country are pro-immigration and support international redistribution efforts (Scheve and Slaughter, 2001; Mayda, 2006; Hainmueller and Hiscox, 2007; Bechtel et al., 2014). Conversely,

the findings with respect to Japan, South Korea, and Singapore are more novel. This study is the first to present the possibility that the correlation structures of altruistic discrimination and education differ across countries.

Why do the correlation structures differ across these five countries? This can be explained by considering country differences in labor markets as they relate to immigrants and foreign workers. Germany has accepted a large number of less-educated foreign workers since World War II, and thus natives with a lower education are competitive with immigrants and foreign workers in Germany. In contrast, Japan, South Korea, and Singapore have only recently become accepting of immigrants, who tend to be more-educated foreign experts with high skills; thus natives with higher education levels are competitive with foreign workers in these three countries. We suggest that this reasoning is plausible according to the previous literature and national/international statistics. We expect future research to empirically demonstrate that labor market environments are causative of pro-family altruistic discrimination dynamics against foreigners.

Here, we note that we cannot reject another, alternative explanation concerning cross-country differences in the effects and implications of receiving higher education. D'Hombres and Nunziata (2016) use European Social Survey and Labor Force Survey data to demonstrate that an exogenous increase in the number of years in education causes a softening in natives' attitudes toward immigrants. If we find the opposite effect from Japan, South Korea, and Singapore, the alternative explanation would be valid. Future research should explore this possibility.

There is one possibility that both of these explanations are complimentary, rather than substitutes. D'Hombres and Nunziata (2016) do not empirically reveal mechanisms of positive causal effects. In their discussion, they provide one possible mechanism wherein receiving higher education qualifies people for occupational positions where they face less competition with immigrants and foreign workers. This mechanism is one example of our explanation that labor market environments shape pro-family altruistic discrimination against foreigners.

Another possibility is that the explanatory mechanism itself also differs across countries. For example, in Japan, South Korea, and Singapore, labor market environments might shape pro-family altruistic discrimination dynamics against foreigners, while the other explanations might be valid in Germany. Card et al. (2012) used European samples to show that non-economic factors, including compositional concerns and altruism, better explained citizens' attitudes toward immigrants and

foreign workers than concerns about the economic impact on employments and wages. Testing this possibility is also left to future research.

In sum, our current empirical results contribute to deepening political discussions about social discrimination against foreigners. Pro-family altruistic discrimination against foreigners is larger in the following order: Japan, the three countries of South Korea, Singapore, the US, and Germany. These results imply that the governments in Japan, South Korea, Singapore, and the US face difficulties in promoting policies for accepting immigrants and foreign workers with concomitant redistribution and post-migration integration policies. We further find that people with a higher education exhibit the highest level of altruistic discrimination in Japan, South Korea, and Singapore. This is surely an observation that warrants attention and scrutiny by governments in these three countries. However, those governments now actively accept highly educated foreign experts who are potentially competitive with native workers of similar education levels. Government policies thus are likely to have caused or triggered high altruistic discrimination in Japan, South Korea, and Singapore.

Tables and figures

Figure 1.1. Hypothetical question (Family member's case)

	Option 1	**Option 2**
Situation 1	$0.00 for you alone	$75.00 for a family member
Situation 2	$0.10 for you alone	$75.00 for a family member
Situation 3	$1.00 for you alone	$75.00 for a family member
Situation 4	$5.00 for you alone	$75.00 for a family member
Situation 5	$10.00 for you alone	$75.00 for a family member
Situation 6	$30.00 for you alone	$75.00 for a family member
Situation 7	$75.00 for you alone	$75.00 for a family member
Situation 8	$90.00 for you alone	$75.00 for a family member

Figure 1.2. Hypothetical question (Unknown foreigner's case)

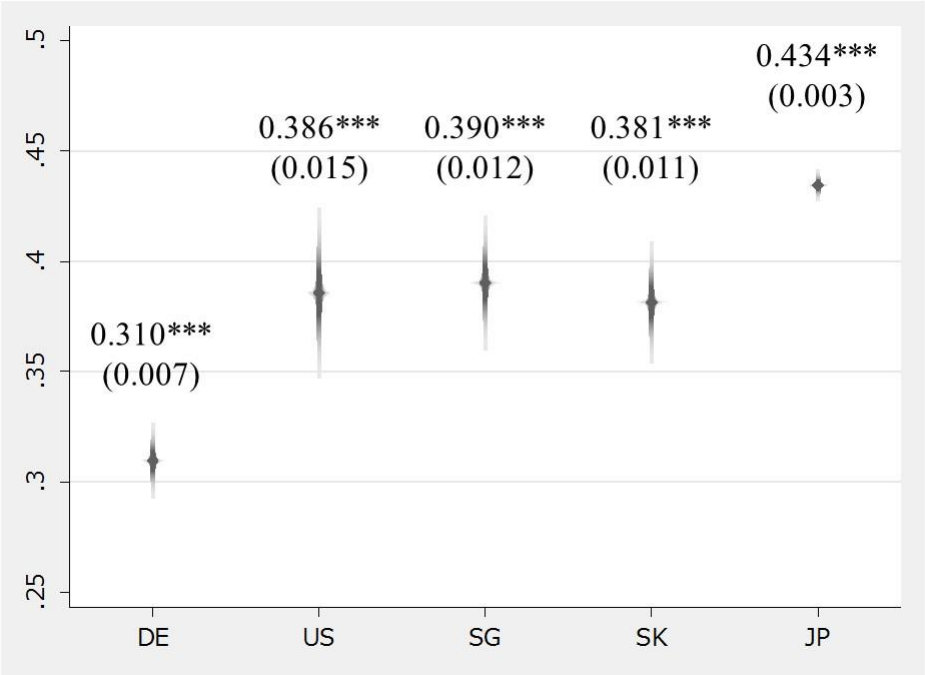
	Option 1	**Option 2**
Situation 1	$0.00 for you alone	$75.00 for a unknown foreigner
Situation 2	$0.10 for you alone	$75.00 for a unknown foreigner
Situation 3	$1.00 for you alone	$75.00 for a unknown foreigner
Situation 4	$5.00 for you alone	$75.00 for a unknown foreigner
Situation 5	$10.00 for you alone	$75.00 for a unknown foreigner
Situation 6	$30.00 for you alone	$75.00 for a unknown foreigner
Situation 7	$75.00 for you alone	$75.00 for a unknown foreigner
Situation 8	$90.00 for you alone	$75.00 for a unknown foreigner

Table 1. Descriptive statistics

	The US		Germany		Singapore		South Korea		Japan	
Observations:	1,245	Census	1,157	Census	1,231	Census	1,207	Census	8,800	Census
Demographic Variables:										
Female (Dummy)	0.500	0.505	0.493	0.497	0.503	0.512	0.488	0.493	0.492	0.504
20s	0.215	0.218	0.168	0.178	0.285	0.291	0.168	0.187	0.157	0.162
30s	0.202	0.201	0.180	0.180	0.252	0.248	0.226	0.221	0.216	0.205
40s	0.207	0.201	0.249	0.231	0.200	0.197	0.247	0.238	0.205	0.216
50s	0.217	0.214	0.226	0.238	0.167	0.162	0.230	0.226	0.197	0.190
60s	0.158	0.165	0.177	0.173	0.095	0.101	0.128	0.128	0.225	0.227
Spouse (Dummy)	0.581		0.469		0.566		0.630		0.652	
Education Year	14.998		12.985		14.584		15.065		14.523	
Household Income (Standardized by PPP)	66.013		51.836		74.184		63.602		60.670	
Personality Variables:										
Extraversion	7.860		7.532		7.872		7.878		7.754	
Agreeableness	9.790		10.728		9.364		9.049		9.529	
Conscientiousness	10.824		10.554		9.688		8.724		8.247	
Neuroticism	9.371		8.765		8.841		8.338		8.056	
Openness	9.392		9.019		9.087		8.337		8.130	
Behavioral Variables:										
Time-Discounting Factor	0.781		0.799		0.739		0.801		0.811	
Worldview Variables:										
General Trust	5.316		4.883		5.404		5.229		4.757	
Religious	2.709		2.057		2.762		2.435		1.544	
Asceticism	3.608		3.659		3.702		3.456		3.475	
After Death	3.556		2.914		3.414		3.115		2.597	
Presentism	4.165		4.014		4.028		3.744		3.750	
Other-consideration	3.146		3.284		3.148		2.895		2.940	
Self-efficacy	2.847		3.382		3.084		3.152		3.225	
Self-centeredness	2.035		2.831		2.559		2.802		2.640	
Not Society-consideration	2.350		2.630		2.643		2.517		2.213	

Notes*:* Our internet surveys obtained 1,294 respondents in Germany, 1,283 respondents in the US, 1,290 respondents in Singapore, 1,284 repondents in South Korea, and 10,047 respondents in Japan. However, some respondents refused to report their household income. Our analysis uses the samples who answered all the necessary questions. Furthermore, we obtained census data from the "International Data Base" of U.S. Census Bureau (2017a).

Figure 2. Cross-country pro-family altruistic discrimination (Graph)



Notes: Cluster robust standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1

Table 2. Cross-country pro-family altruistic discrimination (Regression results)

N=13,640	(1)	(2)	(3)
Dependent Variable:	**Pro-Family Altruistic Discrimination against Foreigners**		
Germany	0.310***	0.249***	0.245***
	(0.007)	(0.039)	(0.068)
The US	0.386***	0.327***	0.333***
	(0.015)	(0.043)	(0.071)
Singapore	0.390***	0.322***	0.353***
	(0.012)	(0.042)	(0.072)
South Korea	0.381***	0.309***	0.328***
	(0.011)	(0.045)	(0.071)
Japan	0.434***	0.367***	0.359***
	(0.003)	(0.040)	(0.068)
Demographic Variables	NO	YES	YES
Personality and Worldviews Variables	NO	NO	YES
R-squared	0.575	0.582	0.604

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 3. Five-country differences

Means and Differences of Altruistic Discrimination	Japan	South Korea	Singapore	The US
	0.434***	0.381***	0.390***	0.386***
	(0.003)	(0.009)	(0.012)	(0.013)
Germany	Japan − Germany	South Korea − Germany	Singapore − Germany	The US − Germany
0.310***	0.125***	0.072***	0.080***	0.076***
(0.009)	(0.009)	(0.013)	(0.015)	(0.016)

Table 4. Japan–Germany comparison

Panel A:	**Japan-Germany Comparison**		
Blinder-Oaxaca Decomposition	(1) Endowments Effect	(2) Coefficients Effect	(3) Interaction Effect
Overall:	0.022*	0.106***	-0.003
	(0.011)	(0.010)	(0.012)
Details:			
Female	0.000	0.018**	-0.000
	(0.001)	(0.008)	(0.001)
Income	-0.003	0.029**	0.005*
	(0.002)	(0.013)	(0.003)
Education Year	-0.009**	0.120***	0.014***
	(0.004)	(0.039)	(0.005)
Age	0.002	0.002	-0.002
	(0.003)	(0.002)	(0.002)
Family	0.028***	-0.041*	-0.021***
	(0.005)	(0.022)	(0.006)
Personality and Worldviews	0.005	0.037	0.001
	(0.012)	(0.110)	(0.012)
Constant		-0.059	
		(0.127)	
Observations		9,957	
Panel B:		(4)	(5)
Parts of Regression Results		Japan	Germany
Female		-0.001	-0.037**
		(0.005)	(0.015)
Income		0.0002**	-0.0004*
		(0.0001)	(0.0002)
Education Year		0.003**	-0.006***
		(0.002)	(0.003)

Note: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5.1. Education and altruistic discrimination in Japan

N=8,800 (Japan Sample)	(1)	(2)	(3)
Dependent Variable:	**Pro-Family Altruistic Discrimination against Foreigners**		
Educational Year	0.003**		
	(0.002)		
High School or Lower		0.333***	
		(0.040)	
Junior College		0.340***	0.007
		(0.035)	(0.010)
Bachelor's Degree		0.348***	0.015*
		(0.039)	(0.008)
Master's Degree or Higher		0.361***	0.028***
		(0.039)	(0.010)
Constant	0.293***	No Constant	0.333***
	(0.049)		(0.040)
Demographic Variables	YES	YES	YES
Personality and Worldviews Variables	YES	YES	YES

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5.2. Education and altruistic discrimination in Germany

N=1,157 (Germany Sample)	(1)	(2)	(3)
Dependent Variable:	**Pro-Family Altruistic Discrimination against Foreigners**		
Educational Year	-0.006**		
	(0.003)		
Elementeary Vocational Education		0.245**	-0.053
or Lower		(0.093)	(0.032)
Intermediate Vocational Education		0.298***	
		(0.101)	
High Intermediate Vocational Education		0.251**	-0.047
		(0.095)	(0.029)
Advanced Vocational Education		0.202*	-0.095**
		(0.099)	(0.035)
General Education		0.245**	-0.052**
		(0.106)	(0.022)
College		0.218**	-0.079**
		(0.096)	(0.030)
University or Higher		0.246**	-0.052**
		(0.098)	(0.023)
Constant	0.330**	No Constant	0.298***
	(0.118)		(0.101)
Demographic Variables	YES	YES	YES
Personality and WorldviewsVariables	YES	YES	YES

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Appendix A

The Tables below present each country's educational background and years in education. Our internet surveys grasp respondents' educational background. We use education system diagrams (Ministry of Education, Culture, Sports, Science and Technology, 2013) to convert educational background into years in education. We also combine some educational background and construct a new classification variable.

Table Appendix A.1. Germany's education system

Educational Background	Classification	Educational Year	Obs.
Grundschule	Elementary Vocational Education or Lower	4	6
Hauptsschule		9	92
Realschule	Intermediate Vocational Education	10	230
Berufsschule	High Intermediate Vocational Education	12	300
Fachoberschule	Advanced Vocational Education	17	52
Gymnasium	General Education	13	147
Gesamtschule		13	8
Fachhochschule	College	17	132
Universitat	University or Higher	17	186
Graduiertenkolleg		22	4

Table Appendix A.2. Japan's education system

Educational Background	Classification	Educational Year	Obs.
Elementary and Junior High Schools	High School or Lower	9	72
Dropout from High Schools		9	109
Graduated from High Schools		12	2,313
Dropout from Junior College		12	89
Dropout from University (Bachelor's Degree)		12	192
Graduated from Junior College	Junior College	14	1,442
Graduated from University (Bachelor's Degree)	Bachelor's Degree	16	3,993
Dropout from Graduate School (Master's Degree)		16	28
Graduated from Graduate School (Master's Degree)	Master's Degree or Higher	18	432
Dropout from Graduate School (Doctoral Degree)		18	32
Graduated from Graduate School (Doctoral Degree)		21	98

Table Appendix A.3. South Korea's education system

Educational Background	Classification	Educational Year	Obs.
Elementary School	High School or Lower	6	4
Junior High School		9	5
High School		12	205
Special School		12	7
Junior College	Junior College	14	170
University (Bachelor's Degree)	Bachelor's Degree	16	692
Graduate School (Master's Degree)	Master's Degree or Higher	18	96
Graduate School (Doctoral Degree)		21	28

Table Appendix A.4. Singapore's education system

Educational Background	Classification	Educational Year	Obs.
Primary School	Secondary School or Lower	6	7
Secondary School		10	178
Institute of Technical Education	Vocational Education	13	57
Polytechnics	Polytechnics or Centralised Institute	13	254
Centralised Institute		13	25
Junior College	Junior College	12	94
University (Bachelor's Degree)	Bachelor's Degree	17	476
Graduate School (Master's Degree)	Master's Degree or Higher	19	123
Graduate School (Doctoral Degree)		22	17

Table Appendix A.5. The US's education system

Educational Background	Classification	Educational Year	Obs.
Grade School	High School or Lower	6	3
Some High School		9	21
Graduated from High School		12	195
Some College (No Degree)	Some College (No Degree)	14	270
Graduated from College (Associate's Degree, 2 Year)	Associate's Degree	14	142
Graduated from College (Bachelor's Degree, 4 Year)	Bachelor's Degree	16	349
Some Post Graduate Studies (No Degree)	Graduate School (No Degree)	18	60
Master's Degree	Master's Degree or Higher	18	175
Doctoral Degree		21	30

Appendix B

Table Appendix B. Cross-country pro-family altruistic discrimination (Robustness check)

N=12,409	(1)	(2)	(3)
Dependent Variable:	**Pro-Family Altruistic Discrimination against Foreigners**		
Germany	0.358***	0.293***	0.280***
	(0.013)	(0.038)	(0.068)
The US	0.444***	0.380***	0.375***
	(0.016)	(0.040)	(0.072)
South Korea	0.387***	0.312***	0.329***
	(0.010)	(0.044)	(0.071)
Japan	0.442***	0.373***	0.362***
	(0.003)	(0.040)	(0.068)
Ratio of Foreigners	-0.455***	-0.444***	-0.343***
	(0.112)	(0.114)	(0.106)
Demographic Variables	NO	YES	YES
Personality and Worldviews Variables	NO	NO	YES
R-squared	0.578	0.585	0.606

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

We obtained the ratio of foreign born residents by state/county/prefecture from each country's foreign population statistics (DESTATIS, 2017; US Census Bureau, 2017b; Statistics Korea 2017; Ministry of Justice, 2017). We did not find that in Singapore.

Appendix C.1

We conduct Blinder-Oaxaca decomposition analysis between Germany and South Korea, Singapore, and the US. We investigate whether the similar results found in the Japan–Germany comparison are observed in the other comparisons. First, we only find a positive and statistically significant coefficient effect of educational years in the Singapore-Germany comparison, not in the South Korea–Germany or US–Germany comparison. Next, when we use the dummy variables of educational backgrounds and conduct the regression analysis with each country's sample, we find that similarities with Japan exist in the South Korean and Singaporean correlation structures between altruistic discrimination and education. Specifically, people with a Master's degree and higher exhibit rather lower altruism toward foreigners than toward family members in those two countries. Furthermore, histories, previous literature, and statistics support the possibility that South Korean and Singaporean people with a higher education could be competitive with foreign workers, similar to the situation in Japan.

Table Appendix C.1. Other comparisons

Panel A:	**South Korea-Germany Comparison**			**Singapore-Germany Comparison**			**The US-Germany Comparison**		
Blinder-Oaxaca Decomposition	(1) Endowments Effect	(2) Coefficients Effect	(3) Interaction Effect	(6) Endowments Effect	(7) Coefficients Effect	(8) Interaction Effect	(11) Endowments Effect	(12) Coefficients Effect	(13) Interaction Effect
Overall:	-0.002	0.085***	-0.011	-0.017	0.063***	0.034*	-0.038***	0.068***	0.046***
	(0.011)	(0.027)	(0.023)	(0.011)	(0.015)	(0.019)	(0.009)	(0.021)	(0.018)
Details:									
Female	0.000	0.008	-0.000	-0.000	0.022	0.000	-0.000	0.031***	0.000
	(0.001)	(0.011)	(0.000)	(0.001)	(0.015)	(0.001)	(0.001)	(0.012)	(0.001)
Income	-0.005	-0.004	-0.001	-0.009	0.032**	0.014**	-0.006	0.033**	0.009*
	(0.003)	(0.019)	(0.004)	(0.005)	(0.015)	(0.007)	(0.004)	(0.016)	(0.005)
Education Year	-0.012**	0.125	0.020	-0.009**	0.116***	0.014***	-0.012**	0.059	0.009
	(0.005)	(0.090)	(0.014)	(0.004)	(0.040)	(0.005)	(0.005)	(0.071)	(0.011)
Age	-0.001	-0.002	0.002	0.003	0.001	0.018**	0.001	0.003	-0.003
	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.008)	(0.002)	(0.003)	(0.003)
Family	0.042***	-0.082**	-0.049***	0.044***	-0.021	-0.011	0.013***	-0.046	-0.007
	(0.008)	(0.032)	(0.012)	(0.010)	(0.031)	(0.013)	(0.004)	(0.031)	(0.006)
Personality and Worldviews	-0.027***	0.007	0.017	-0.046***	0.232	-0.001	-0.034***	0.016	0.037***
	(0.010)	(0.146)	(0.012)	(0.008)	(0.148)	(0.017)	(0.009)	(0.135)	(0.014)
Constant		0.033			-0.318*			-0.028	
		(0.187)			(0.173)			(0.157)	
Observations		2,364			2,388			2,402	
Panel C:		(4)	(5)		(9)	(10)		(14)	(15)
Parts of Regression Results		South Korea	Germany		Singapore	Germany		the US	Germany
Female		-0.022	-0.037**		0.007	-0.037**		0.025	-0.037**
		(0.016)	(0.015)		(0.028)	(0.015)		(0.018)	(0.015)
Income		-0.0005*	-0.0004*		0.0002	-0.0004*		0.0002	-0.0004*
		(0.0003)	(0.0002)		(0.0002)	(0.0002)		(0.0002)	(0.0002)
Education Year		0.004	-0.006***		0.003**	-0.006***		-0.001	-0.006***
		(0.006)	(0.003)		(0.002)	(0.003)		(0.005)	(0.003)

Note: Cluster robust standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1

Appendix C.2. South Korea–Germany comparison

Column 2 of Appendix Table C.1 reports that the coefficient effect of educational years is 0.127 in the South Korea–Germany comparison, but the effect is not statistically significant at any level. When conducting the regression analysis with the South Korean sample and educational background dummy variables, Appendix Table C.2 shows that pro-family altruistic discrimination against foreigners is lowest among South Koreans with junior college, but highest among those with a Master's degree or higher. The latter result is consistent with the results from Japan.

When investigating South Korean immigration policies, we find similarities with Japan in the labor market environments related to foreign workers (The Japan Institute for Labour Policy and Training, 2012). After World War II, the South Korean government sent native workers abroad, similar to Japan. Because of current labor shortages, the government is now starting to accept foreign workers. However, when accepting less-educated workers without skills, the government allocates them to some industries where (native) labor shortages are particularly pronounced. By contrast, the government accepts more-educated experts with high skills across the board. These observations support the possibility that natives with higher education are competitive with foreign workers in the South Korean labor market and can thus perhaps explain why South Korean people with a Master's degrees and higher exhibit lower altruism toward foreigners.

Table Appendix C.2. Education and altruistic discrimination in South Korea

N=1,207 (South Korea Sample)	(1)	(2)	(3)
Dependent Variable:	**Pro-Family Altruistic Discrimination against Foreigners**		
Educational Year	0.004		
	(0.007)		
High School or Lower		0.380**	0.016
		(0.137)	(0.036)
Junior College		0.364**	
		(0.150)	
Bachelor's Degree		0.390***	0.025
		(0.131)	(0.024)
Master's Degree or Higher		0.453***	0.088**
		(0.145)	(0.035)
Constant	0.325*	No Constant	0.364**
	(0.164)		(0.150)
Demographic Variables	YES	YES	YES
Personality and Worldviews Variables	YES	YES	YES

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Appendix C.3. Singapore–Germany comparison

Column 7 of Appendix Table C.1 reports that the coefficient effect of educational years is 0.118 in the Singapore–Germany comparison. Similar to the Japan–Germany comparison, the effect is statistically significant at the 1% level. When conducting the regression analysis with the Singaporean sample and dummy variables of educational backgrounds, Appendix Table C.3 shows that altruistic discrimination is low among Singaporeans with a technical education, but rises among those with a Master's degrees and higher. The latter result is also consistent with the results from Japan.

In the 1950s, Singapore set an immigration policy to accept foreigners who could contribute to the country's socio-economic development (Fong and Lim, 1982). Specifically, lower-skilled foreign workers were allowed to live there temporarily, but were prohibited from settling permanently, bringing their families to settle there, or marrying Singaporean citizens. By contrast, Singapore actively accepts more-educated workers and wealthier people, who are also allowed to be permanent residents. These facts support the possibility that natives with a higher education are also competitive with foreign workers in the Singaporean labor market, and could explain why Singaporean people with a Master's degrees and higher exhibit lower altruism toward foreigners.

Table Appendix C.3. Education and altruistic discrimination in Singapore

N=1,231 (Singaporean Sample)	(1)	(2)	(3)
Dependent Variable:	**Pro-Family Altruistic Discrimination against Foreigners**		
Educational Year	0.003		
	(0.002)		
Secondary School or Lower		0.164	0.081*
		(0.167)	(0.034)
Vocational Education		0.083	
		(0.166)	
Plytechnics or Centralised Institute		0.188	0.105***
		(0.170)	(0.014)
Junior College		0.083	-0.000
		(0.168)	(0.040)
Bachelor's Degree		0.161	0.077**
		(0.172)	(0.024)
Master's Degree or Higher		0.192	0.108**
		(0.177)	(0.024)
Constant	0.099	No Constant	0.083
	(0.157)		(0.166)
Demographic Variables	YES	YES	YES
Personality and Worldviews Variables	YES	YES	YES

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Appendix C.4. US–Germany comparison

Column 12 of Appendix Table C.1 reports that the coefficient effect of educational year is 0.061 in the US–Germany comparison. The effect size is relatively small and statistically insignificant at any level. When conducting the regression analysis with the American sample and dummy variables of educational background, Appendix Table C.4 shows that American altruistic discrimination is insensitive to educational background. This result indicates that the American correlation structure between the dependent variable and education is different not only from that in Germany but also from those in Japan, South Korea, and Singapore.

Why was no correlation found between altruistic discrimination and education in the US sample? One possible explanation here is that natives are not competitive toward foreign workers in all educational strata. We find some evidence that supports this explanation; in 2009, the government enforced the Employ American Workers Act, where the government prohibited employers from dismissing a native worker to employ a foreign worker. In addition, several empirical studies based on US data show that receiving immigrants and foreign workers has a marginal or zero impact on native workers' wages and employment (Card, 2005). These facts support the possibility that natives in any education stratum are not competitive with foreign workers in the US. However, another possible explanation is that natives are rather competitive toward foreign workers in all educational strata. Thus, the underlying mechanism is unclear in terms of the lack of a significant correlation between altruistic discrimination and education.

Table Appendix C.4. Education and altruistic discrimination in the US

N=1,245 (The US Sample)	(1)	(2)	(3)
Dependent Variable:	**Pro-Family Altruistic Discrimination against Foreigners**		
Educational Year	-0.001		
	(0.005)		
High School or Lower		0.247**	
		(0.103)	
Some College (No Degree)		0.249**	0.002
		(0.109)	(0.026)
Associate's Degree		0.264**	0.017
		(0.103)	(0.031)
Bachelor's Degree		0.242**	-0.006
		(0.112)	(0.035)
Graduate School (No Degree)		0.230*	-0.017
		(0.122)	(0.056)
Master's Degree or Higher		0.249**	0.002
		(0.107)	(0.028)
Constant	0.264**	No Constant	0.247**
	(0.113)		(0.103)
Demographic Variables	YES	YES	YES
Personality and Worldviews Variables	YES	YES	YES

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

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