

# School Bullying is Positively Associated with Support for Redistribution in Adulthood\*

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## Abstract

I document that being bullied at school has a strong positive association with support for redistribution in adulthood. Using unique Japanese survey data, I estimate that the bullied are 5-7 percentage points more likely to support redistribution. I carefully examine whether omitted factors drive this positive association by considering a rich set of socioeconomic and psychological mediators. The estimate is robust to such controls.

*JEL classification:* D72, H23, I20

*Keywords:* Support for Redistribution; School Bullying; Long-Run Impact

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# 1 Introduction

People have heterogeneous preferences for redistribution. While income redistribution is an economic issue, a canonical self-interested economic model does not fully explain the variation in preferences. Researchers in social science have investigated the reasons, finding the importance of various socioeconomic and psychological factors (e.g., Meltzer and Richard 1981; Ohtake and Tomioka 2004; Alesina and Giuliano 2011; Kuziemko et al. 2015; Sznycer et al. 2017).

In this article, I document a strong positive association between being bullied at school and the support for redistribution in adulthood by utilizing the Japanese Life Course Panel Survey (JLPS), a unique survey asking both about the experience of school bullying and about a battery of political opinions. Other things equal, being bullied at school is associated with around 5-7pp increase in the probability of supporting redistribution. To my knowledge, this is the first study to show a strong association between school bullying and political preferences in adulthood.

The estimated positive association is robust to controlling for various factors. First, a rich set of socioeconomic variables does not explain the association. Second, various psychological mediators known in the literature do explain some association, but more than two-thirds of the effect is left unexplained. Third, I show that the positive association is not explained by other misfortunes such as parental or own past unemployment. Overall, the estimates are very robust to including various controls, implying a limited role of omitted factors. Thus, at least given the available information in my data, school bullying seems to induce more support for redistribution.<sup>1</sup> It should be emphasized, however, that I cannot fully establish that the correlation is causal in the absence of randomization, which is a natural limitation since it is ethically infeasible to randomly assign school bullying.<sup>2</sup>

My result contributes to the long-standing debate about the determinants of preferences for redistribution. In particular, it has been shown that misfortunes, such as past unemployment and disasters, affect support for redistribution (e.g., Alesina and Giuliano 2011; Gärtner et al. 2017; Gualtieri et al. 2019). Even without a direct economic impact, misfortunes are likely to affect the support for redistribution as it might make people more risk-averse and less optimistic about upward mobility (Alesina and Giuliano 2011). Importantly, the positive association with school bullying does not disappear by controlling for various other misfortunes in the past, implying the distinctiveness of school bullying.

My result is also suggestive of a new long-term impact of school bullying: its effect on political

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<sup>1</sup>Of course, it is hard to believe that bullying affects the support for redistribution without any effect on socioeconomic or psychological factors. The bullying effect would operate through some factors unobservable in my data. See also the discussion section.

<sup>2</sup>Eriksen et al. (2014) use family circumstances of classmates as instrumental variables for school bullying in investigating the effect on later school performance, which might be plausible in the absence of the uncontrolled peer effect. Unfortunately, I cannot try such an empirical strategy as no information on classmates is available.

preferences. It has been argued that school bullying has a long-term adverse impact on many aspects such as educational attainment, future earnings, physical health, and mental health (e.g., Brown and Taylor 2008; Wolke et al. 2013). The effect on political preferences is a new potential impact of school bullying. More generally, it has been shown that experiences at school, such as curricula, may affect political preferences later in life (e.g., Cantoni et al. 2017; Ito et al. 2020). This paper contributes to this argument by highlighting the importance of school bullying.

## 2 Methods

### 2.1 Data

I use the Japanese Life Course Panel Survey (JLPS) 2007. The JLPS contains various socioeconomic and psychological variables, political opinions, and the self-reported experience of being bullied at school. The JLPS data consist of a representative sample of Japanese residents at the age of 20 to 40. The JLPS can be obtained through the Center for Social Research and Data Archives, the University of Tokyo. See Ishida (2013) for details of the sampling and data collection procedures. After deleting samples with missing response to the outcome variable, the sample size is 4345.<sup>3</sup> I focus on 2007 data (wave 1) as the experience of school bullying was asked only in 2007.<sup>4</sup>

The survey asks if a respondent was bullied at school or not, without distinguishing at which stage in life the school bullying happened. Thus, the experience of having being bullied is measured in reflection, rather than measured contemporaneously. Based on this limitation, I prefer to interpret the positive association in my paper as the effect of serious and unforgettable school bullying for two reasons. First, since the bullying experience was recalled in adulthood, it is not reported if already forgotten at the time of the survey. Second, since the experience is self-reported, it is possible that a subtle bullying behavior is perceived as bullying by someone but not by others.<sup>5</sup> These arguments imply that the average effect of all bullying, not necessarily serious and unforgettable, might be smaller. These limitations should be kept in mind in interpreting my results.<sup>6</sup>

The outcome variable of interest is the support for redistribution, which two questions measure. The first question asks for the response to the following statement in a 5-point Likert scale: "It is the gov-

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<sup>3</sup>While I cannot completely ascertain that the non-response is random, the fraction of the bullied samples after dropping the non-responses (0.2173) is close to the fraction before deleting the non-responses (0.2160), and the former is statistically indistinguishable from 0.2160 ( $p \simeq 0.84$ ).

<sup>4</sup>If this question had been asked in other waves, I could have examined how the memory of school bullying might disappear over time. I focus on the 2007 data since this is not the case in the JLPS throughout the main text. In Appendix C, I replace the outcome variable in 2007 with that measured in 2015 and see if the impact of school bullying is persistent.

<sup>5</sup>The heterogeneity of victims in the sensitivity to bullying behavior might introduce complications in interpreting my result as causal if the sensitivity is related with support for redistribution.

<sup>6</sup>Note, however, that this paper does not concentrate on a marginal subset of bullying: In my data, more than 20% of the respondents report the experience of being bullied.

ernment’s responsibility to reduce income disparity.” In the same way, the second question elicits the response to the statement “Improvement of social welfare like pension and elderly medical care should be supported even under difficult financial situations.” While wordings are different, both of them capture the support for the welfare state. Reassuringly, my results are quite similar regardless of the choice of the questions, implying both questions measure the same object (see Appendix C).<sup>7</sup> For simplicity, I focus on the response to the first question throughout the paper.

## 2.2 Regression Analysis

I conduct regression analysis to control for various factors. I use the linear probability model:

$$redistribution_i = \beta bullied_i + \delta X_i + \varepsilon_i, \quad (1)$$

where  $i$  denotes an individual,  $bullied_i$  is a dummy of whether a person was bullied at school or not,  $X_i$  is control variables (including the constant term), and  $\varepsilon_i$  is the error term. All control variables are recorded categorically and I control for them non-parametrically.  $\beta$  denotes the effect school bullying on the probability of supporting redistribution, which is the parameter of interest. Throughout this paper, the dependent variable is a dummy ( $redistribution_i$ ) that takes 1 if person  $i$  agrees or somewhat agrees with the statement “It is the government’s responsibility to reduce income disparity.” The dummy takes 0 otherwise.<sup>8</sup> I report heteroskedasticity-robust standard errors. I also experimented with logit and probit models and confirmed that they yield essentially the same implications.<sup>9</sup>

I do not claim that my results definitely capture the causal relationship since people with certain socioeconomic and psychological characteristics, such as introverted male students, are systematically more likely to be bullied (c.f., Brown and Taylor 2008; Wolke et al. 2013). Having said this, to suggest that the revealed association might be a causal one, I include various controls by exploiting the richness of the JLPS. The assumption for causal interpretation is that conditional on the controls, the error term is uncorrelated with the self-reported experience of bullied at school. In addition, to provide a conservative estimate about the causal effect of school bullying, I report Oster’s lower-bound. It assumes that the selection on omitted variables is equally proportional to that on observed variables. I set the maximal  $R^2$  to 1.3 times the  $R^2$  of the regression, which is recommended by Oster (2019).

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<sup>7</sup>I have also constructed a synthetic index on support for redistribution by combining these two questions, which again yields the similar results. See Appendix C for details.

<sup>8</sup>This is sensible since only a small fraction of people express the disagreement regardless of the bullying experience (see Figure 1). Put differently, the meaningful margin is whether people agree with the statement or not.

<sup>9</sup>I have used two additional specifications in Appendix D. First, I have tried ordered probit model where 5-point Likert scale to the outcome variable is directly used. The results are similar to my main result. It also shows that being bullied is more strongly associated with the answer “agree” rather than “somewhat agree.” Second, I have tried the propensity score matching using the binary outcome variable as in (1). The estimated effects are similar to my main results.

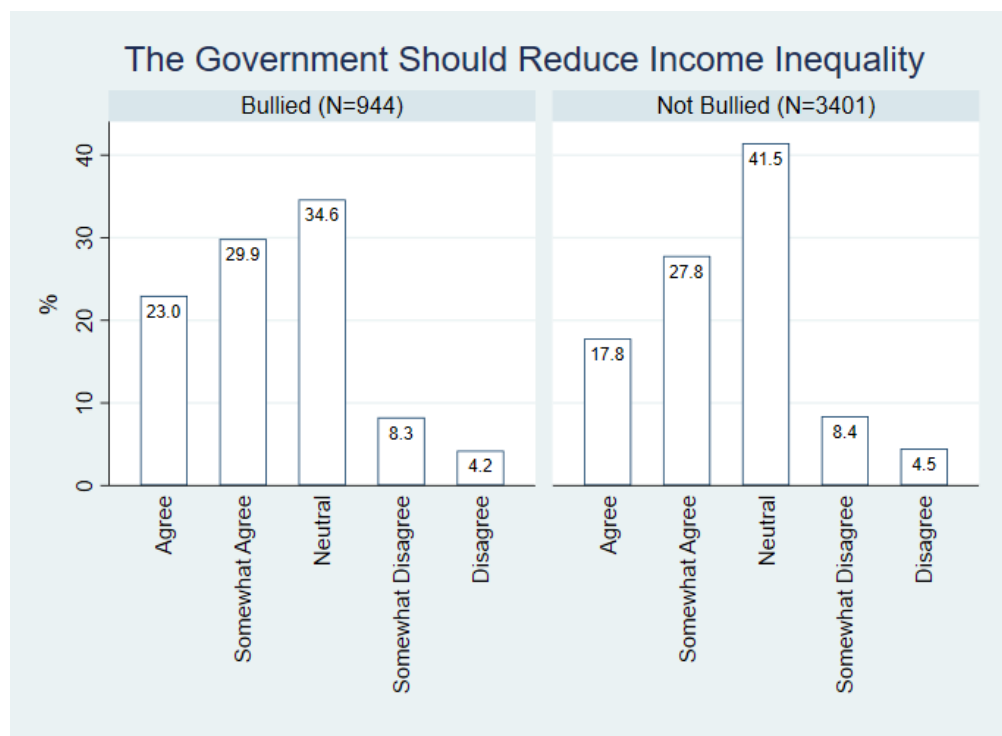


Figure 1: Support for Redistribution by the Experience of Getting Bullied

### 3 Results

#### 3.1 Descriptive Evidence

The strong association of school bullying and support for redistribution is apparent in the raw data. Figure 1 shows the five-scale responses to the statement that the government is responsible for reducing inequality. The left panel is about those who report to have been bullied at school, and the right panel is about those who do not. While only a small fraction of people expresses disagreement in both sub-samples, the bullied people are more likely to express active support for the statement rather than remaining neutral. In particular, 23% of those who report the experience of being bullied express an unambiguous support for the statement, while the number is 17.8% for those who were not bullied. Thus, the bullied are  $23/17.8 \approx 1.3$  times more likely to express the definite support for redistribution.

#### 3.2 Regression Results

##### Baseline Regression:

Table 1 shows the regression results. In column 1, I run the simple regression without any controls. The experience of school bullying is associated with 7.2pp increase in the support for redistribution. This estimate is significant both economically and statistically, confirming the descriptive evidence in Figure 1.

	(1)	(2)	(3)	(4)
Bullied at school	0.0723*** (0.0184)	0.0716*** (0.0189)	0.0549*** (0.0175)	0.0543*** (0.0180)
Oster's lower bound	N/A	0.0714	0.0478	0.0498
Socioeconomic factors	No	Yes	Yes	Yes
Psychological factors	No	No	Yes	Yes
Other misfortunes	No	No	No	Yes
<i>N</i>	4345	4345	4345	4345
<i>R</i> <sup>2</sup>	0.004	0.042	0.211	0.214

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 1: Regression results

### Socioeconomic Controls:

A natural explanation for the positive association with school bullying is that experiencing school bullying damages the socioeconomic status of people in adulthood, thereby enhancing support for redistribution. Indeed, bullying has been shown to have long-term negative impacts on education attainments and future earnings (e.g., Brown and Taylor 2008). Since the poor are those who benefit from the redistribution policy, it would increase the support for redistribution (Meltzer and Richard 1981).

Interestingly, this hypothesis clearly fails to explain my finding. Column 2 of Table 1 shows that the estimate is essentially unchanged by including socioeconomic factors. I control for household income, family size, gender, age, marital status, educational attainment, the region, the city size, self-assessed social and communication skills, and the economic condition when a survey respondent was 15.<sup>10</sup> Not only these variables might mediate the bullying effect, they, especially the last two factors, might also control for the determinants of bullying experiences at school (Wolke et al. 2013). Despite the rich set of controls, the coefficient is remarkably stable.

### Psychological Controls:

Given that socioeconomic factors do not seem to explain the positive association, I turn to investigating how it is mediated by psychological factors. Not only revealing the mechanism behind the positive association, it also addresses the endogeneity of bullying if the psychological factors are correlated with the propensity for getting bullied at school. For example, people with low self-confidence, which is associated with support for redistribution, might be more likely to be bullied.

My data allow me to obtain proxies for psychological factors related to redistribution.<sup>11</sup> The in-

<sup>10</sup>Social and communication skills are evaluated at four aspects: explaining things to others, talking with strangers, organizing people, and having pleasant conversations.

<sup>11</sup>The survey also measures physical and mental health conditions. I find no evidence that they mediate the school bullying effect.

cluded variables are related to various mediating factors proposed in the literature, such as perceptions on inequality (e.g., Cruces et al. 2013; Karadja et al. 2017), socioeconomic position (e.g., Condon and Wichowsky 2020), social mobility (e.g., Piketty 1995; Gärtner et al. 2020), effort versus luck in income determination process (e.g., Alesina and Angeletos 2005; Mollerstrom and Seim 2014), and intergenerational mobility (e.g., Alesina et al. 2018).<sup>12</sup> While not completely exhaustive, the included variables would collectively account for a diverse set of mediating factors. I also analyze in Appendix A.2 additional mediating factors: social trust (e.g., Daniele and Geys 2015), altruism (proxied by volunteering activities), national identity (e.g., Shayo 2009), and party affiliation (e.g., Bisgaard 2019). All of them have, at most, only a limited impact on my estimate.

Column 3 of Table 1 reports the regression result controlling for the psychological mediating variables. Reassuringly,  $R^2$  greatly increases compared with columns 1 and 2, suggesting they indeed capture the important determinants of support for redistribution. The coefficient of school bullying is now around 5.5pp. This is smaller than 7.2pp in columns 1 and 2, suggesting that psychological mediators are more important than socioeconomic ones, but the coefficient is still significant and sizable. Indeed, around  $5.5/7.2 \simeq 76\%$  of the effects are left unexplained. Overall, a rich set of mediating factors does not well explain the positive association with school bullying.

### **Distinctiveness from Other Misfortunes:**

I now show that school bullying is unique from other misfortunes in terms of the association with support for redistribution. Even without direct economic damages, it has been argued that misfortunes might update perceptions about risks and upward mobility, thereby promoting support for redistribution (Alesina and Giuliano 2011). The JLPS contains the self-reported experience of many other misfortunes: parental unemployment or failure in business, parental divorce, parental re-marriage, failure in business, unemployment, career change, cohabitation, divorce, re-marriage, serious accidents and disasters, criminal victimization, serious disease and injury, and nursing family members.<sup>13</sup>

Column 4 of Table 1 reports the results controlling for these self-reported misfortunes. The coefficient is essentially the same as column 3, implying that the positive association with school bullying is robust and distinguishing from other misfortunes. Some other misfortunes, such as own unemployment, are also significantly associated with support for redistribution. However, the estimates are not as robust as the estimated coefficient of school bullying (see Appendix B for details). School bullying is the only misfortune that keeps exhibiting strong statistical significance.

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<sup>12</sup>The included variables are answers on the following: Seriousness of income inequality, self-assessed socioeconomic position, the importance of education and/or wealthy parents in determining social class, the importance of inequality for growth, interests in politics, expected living conditions after ten years, unemployment prospect in one year, and the confidence in the respondent overcoming difficulties by themselves. See Table A.1 for a summary.

<sup>13</sup>Some events, such as cohabitation, are arguably not misfortunes. However, as they were asked in combination with other misfortunes, I control for all of these events.

### **Lower-bound Estimates:**

To assess the importance of the omitted factors, I report Oster’s lower-bounds in columns 2-4 of Table 1. The most conservative estimate in column 3 is about 4.7pp, suggesting that still around two-thirds of the effect is left unexplained relative to 7.2pp in column 1. Therefore, in considering the positive association with school bullying, the observed mediating factors and similar unobserved ones play only a limited role, implying that it might be a causal relationship.

### **Testing Heterogeneity of the School Bullying Effect:**

I investigate the possibility that the effect is heterogeneous in terms of income and age. First, I consider income. In particular, bullying effect might be prominent among the low-income if the bullied tend to make self-interested decisions. This might be the case if the bullied dislike other people in general. Second, I consider age, which is interesting because the impact of bullying might decay over time if the memory of being bullied gradually disappears.

I test these hypotheses by adding to the specification in column 3 of Table 1 the interaction terms of being bullied and the following continuous variables : household income (in unit of 10,000 Japanese Yen) and age.<sup>14</sup> For both terms, I find no evidence of heterogeneity. The interaction term with income has the coefficient -0.000006 ( $p \simeq 0.903$ ) and that with age has the coefficient 0.000228 ( $p \simeq 0.937$ ). Both estimates are quite close to zero and statistically insignificant, implying that the above hypotheses are not supported.<sup>15</sup>

## **4 Discussion**

I have shown that the self-reported experience of being bullied at school has a strong positive association with the support for redistribution in adulthood. A rich set of socioeconomic and psychological mediators known in the literature plays only a limited role in explaining the effect. The estimate is also robust to controlling for other misfortunes. These results are consistent with the causal interpretation that being bullied at school induces more support for redistribution in adulthood. It is suggestive of a new long-run impact of school bullying: its effect on political preferences.

My results have suggested that a rich set of mediating factors, both socioeconomic and psychological, does not explain the positive association with school bullying, but how does the positive association

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<sup>14</sup>Since the JLPS records income categorically, I assign the mean value of each category to each household.

<sup>15</sup>I have conducted several robustness checks. As for the result on income, to mitigate the concern that the result is driven by outliers, I also estimated the model dropping samples with household income more than 10 million Japanese Yen. The estimated cross-term is 0.000039 and insignificant ( $p \simeq 0.632$ ). As for the effect on age, I used years after graduation instead of age. The coefficient is 0.002626, which is close to zero and statistically insignificant ( $p \simeq 0.404$ ). Finally, I show that the estimate is of similar magnitude even when the outcome variable is measured in 2015 (see Appendix C), implying the persistent impact of bullying.



emerge? Although giving a definite answer to this question is beyond the scope of this short article, many hypotheses are conceivable. For an illustration, I point out four possibilities. First, bullying might foster compassion toward the poor and envy toward the rich (c.f., Szyzycer et al. 2017), which might be plausible given that the bullied do not appear to be more self-interested in my data. Second, the bullied might have more trust on the public sector by recognizing that the private society might feature unjustifiable victimization (c.f., Kuziemko et al. 2015; Peyton 2020). Third, the bullying might be related to various cognitive and non-cognitive abilities (c.f., Mollerstrom and Seim 2014). Finally, bullying might affect attitudes toward economic risks (c.f., Kameda et al. 2016; Gärtner et al. 2017). I believe that disentangling why there is a positive association between being bullied at school and support for redistribution would be illuminating in understanding how heterogeneity in political preferences is formed in people's lives.

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## Appendix (Not for Publication)

### A More on Mediating Factors

#### A.1 The List of Mediating Factors

Table A.1 lists all mediating variables used in my main analysis. It summarizes the included variables and relevant mechanisms, along with a few examples of related studies. See [https://csrda.iss.u-tokyo.ac.jp/panel/project/coding/wave1\\_2007\\_en.pdf](https://csrda.iss.u-tokyo.ac.jp/panel/project/coding/wave1_2007_en.pdf) (English translation) or <https://ssjda.iss.u-tokyo.ac.jp/chosa-hyo/PY010c.pdf> (Japanese) for the style and the wordings of each question.<sup>16</sup>

#### A.2 Additional Mediating Factors

##### **Social Trust:**

Social trust has been documented to be associated with various social outcomes, such as economic growth (Knack and Keefer 1997). In the context of preferences for redistribution, Daniele and Geys (2015) argue that social trust fosters support for redistribution because people anticipate less abuse of welfare systems. I utilize the wave 4 of the JLPS in 2010. Since the JLPS is designed as panel data, the respondents are the same. However, the sample size is reduced from 4345 to 2914 due to attrition. The wave 4 asks the trust question: "In general, people are trustworthy." The possible answers are "yes", "no", and "it depends." I use the response to this question as a proxy for the social trust in 2007. Column 1 of Table A.2 presents the result. The coefficient is about 0.058, which is positive and highly significant. While this number might seem smaller than Table 1, note that the simple regression without controlling for social trust yields 0.0611, which is smaller than column 1 of Table 1.<sup>17</sup> Thus,  $0.0584/0.0611 \simeq 95.5\%$  of the bullying effect is left unexplained. The bullying effect through social trust seems, if any, limited.

##### **Volunteering (proxy for altruism):**

While evaluating the degree of altruism is difficult, a reasonable proxy for altruism is available in the wave 2 of the JLPS in 2008. Since the JLPS is designed as panel data, the respondents are the same. However, the sample size is reduced from 4345 to 3588 due to attrition. The wave 2 asks about the frequency a respondent engages in volunteering activity and the membership status in a volunteering group. I use the answers in 2008 as a proxy for the degree of altruism in 2007. Column 2 of Table A.2 reports the result. The coefficient is around 0.078, which is larger than columns 1 and 2 of Table 1. In this sample, the simple regression yields the coefficient of around 0.077. Since the coefficient is larger than that from the simple regression, there is no evidence that volunteering mediates the effect. Note,

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<sup>16</sup>Both were last accessed on September 4, 2020.

<sup>17</sup>This is because samples absent in 2010 are now dropped.

however, that volunteering might just be a poor proxy for altruism. Further investigation on the role of altruism would be an important future research.

### **National Identity:**

Shayo (2009) argues that the identity of people affects the support for redistribution. In particular, the nationalists are predicted to less likely to support redistribution as they care about the utility of the rich. It might be possible that identity mediates the positive association with school bullying. For example, the bullied might be less likely to be a nationalist because they feel less solidarity with their nation as a whole. The wave 2 asks the five-scale response to the statement "I feel proud to be Japanese." This question is a straightforward way to measure nationalism. Since my main analysis uses the data in 2007, I use the response in 2008 as a proxy for the nationalism in 2007. As no other information on identity is available, I focus on the national identity. The results are reported in the column 3 of Table A.2. It shows that controlling for the degree of national identity has almost no impact on the coefficient (the coefficient slightly decreases from 0.078 to 0.073). Thus, it is unlikely that the association is mediated by the identity.

### **Party Affiliation:**

I turn to party affiliation. Note that controlling for party affiliation might absorb the impact on preferences for redistribution and drive the coefficient toward zero.<sup>18</sup> However, party affiliation might also impact psychological factors. For example, it has been documented that different partisans process the same information in a different way to rationalize their ideology (Bisgaard 2019). Thus, to isolate more direct effects, it might be sensible to control for party affiliation. Column 4 of Table A.2 reports the results. Compared with column 1 of Table 1, the coefficient reduces by around 10%, but about 90% of the estimate is left unexplained by party affiliation.<sup>19</sup> It suggests that even among the same partisans, school bullying is likely to increase support for redistribution.

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<sup>18</sup>Naturally, if we regress  $x$  on  $x$  and other controls, there is no role for other controls even if they actually affect  $x$ . If party affiliation and support for redistribution are essentially the same object, then controlling for party affiliation introduces an analogous problem.

<sup>19</sup>Reassuringly, Oster's lower bound in this case, calculated in the same way as in the main text, is around 0.0622.

Variable Description	Related Mediating Factors	Related Studies
Seriousness of income inequality	Perceived income/ability distribution.	Cruces et al. (2013) Karadja et al. (2017)
Self-assessed socioeconomic class.	Perceived socioeconomic position.	Cruces et al. (2013) Karadja et al. (2017) Condon and Wichowsky (2020)
Education (alma mater) determines social class	A meritocratic view about social mobility.	Piketty (1995) Benabou and Ok (2001) Gärtner et al. (2020)
Important to have wealthy parents.	Perceived Intergenerational mobility. Effort vs luck.	Alesina and Angeletos (2005) Mollerstrom and Seim (2014) Alesina et al. (2018)
Inequality essential for prosperity.	Perceived efficiency cost of redistribution. Effort vs luck.	Fong (2001) Alesina and Angeletos (2005)
Interested in politics.	Knowledge on policies.	Mollerstrom and Seim (2014) Jordan (2018)
Changes in living conditions after ten years.	Tax burden (in the future). Prospects of upward mobility.	Meltzer and Richard (1981) Benabou and Ok (2001)
Unemployment prospect in one year	Risks of future income loss.	Backus and Esteller-Moré (2017)
I can overcome difficulties by myself	Self-confidence.	Ng and Semenov (2019)

Table A.1: Mediation Variables

	(1)	(2)	(3)	(4)
Bullied at school	0.0584*** (0.0221)	0.0785*** (0.0201)	0.0734*** (0.0201)	0.0650*** (0.0182)
Mediator	Social Trust	Volunteering	Identity	Party Affiliation
<i>N</i>	2914	3588	3588	4345
<i>R</i> <sup>2</sup>	0.005	0.005	0.007	0.015

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.2: Additional Mediating Factors

## B The Effects of Other Misfortunes

I now show that school bullying is distinguishing from other misfortunes. Even without direct economic damages, it has been argued that misfortunes might update perceptions about risks and upward mobility, thereby promoting support for redistribution (Alesina and Giuliano 2011). If the school bullying is similar to other misfortunes, controlling for them would make it difficult to detect the positive association with school bullying and lead to an insignificant result. Moreover, so long as school bullying and other unfortunate events are caused by the similar unobserved characteristics, including such events in the regression would serve as a proxy for them. For example, parental divorce might be a result of unpleasant family atmosphere, which might also affect school bullying (c.f., Eriksen et al. 2014).<sup>20</sup>

Table B.1 reports the coefficients of various misfortunes. In column 1, without other control variables, three experiences are significantly associated with support for redistribution: unemployment, nursing a family member, and the school bullying. The magnitudes of the three effects are similar and around 6pp.<sup>21</sup> In columns 2 and 3, I sequentially add the same socioeconomic controls and mechanism variables as in Table 1. Again, even after adding controls, the coefficient of school bullying remains positive and strongly significant. However, the coefficients of other events are not as robust as the coefficient of school bullying. The coefficient of unemployment decreases as I add more controls and loses its significance in column 3. The coefficient of nursing a family member also decreases with additional controls and it is only marginally significant at 10% level in the third column. On the other hand, the coefficients of parental unemployment or business failure and serious diseases and injury become significant after adding controls.<sup>22</sup> Overall, the coefficient of school bullying is robust and distinguishing from other misfortunes.

Which events are associated with the bullying at school? The bullied are more likely to experience other misfortunes. The significant positive correlations are observed with parental unemployment, parental divorce, parental re-marriage, unemployment, job change, cohabitation, severe accidents and disasters, criminal victimization, serious diseases and injury, and nursing a family member. It suggests the importance of considering other misfortunes.

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<sup>20</sup>Note that several parental events are also recorded in my data. Thus, so far as the school bullying is induced by events such as parental unemployment and divorce, the effect of such family events can be controlled for.

<sup>21</sup>The significant estimate of nursing a family member might be a surprise. There are two possible explanations for this. First, nursing somebody is costly, both in money and time, and the actual welfare decreases. It might be natural that somebody in an adverse condition demands redistribution. Second, nursing might be a proxy for altruism.

<sup>22</sup>However, these events are estimated to *decrease* the support for redistribution. This is inconsistent with the hypothesis that experiencing misfortunes induces support for redistribution by affecting people's perception on risks. Relatedly, Gärtner et al. (2017) show that controlling for risk aversion does not explain the effect of misfortunes.



	(1)	(2)	(3)
Bullied at school	0.0618*** (0.0190)	0.0652*** (0.0195)	0.0543*** (0.0180)
Parental unemployment or business failure	-0.0133 (0.0218)	-0.0362 (0.0223)	-0.0381* (0.0209)
Parental divorce	0.0167 (0.0314)	-0.0010 (0.0315)	0.0070 (0.0293)
Parental re-marriage	-0.0604 (0.0438)	-0.0596 (0.0441)	-0.0497 (0.0405)
Business failure	0.0270 (0.0788)	0.0302 (0.0785)	0.0148 (0.0695)
Unemployment	0.0550** (0.0226)	0.0438* (0.0233)	0.0112 (0.0216)
Career change	-0.0062 (0.0165)	0.0038 (0.0173)	0.0049 (0.0159)
Cohabitation	-0.0008 (0.0214)	0.0038 (0.0224)	0.0092 (0.0206)
Divorce	0.0009 (0.0443)	-0.0201 (0.1412)	-0.1408 (0.1279)
Re-marriage	-0.0455 (0.0632)	-0.0196 (0.1325)	0.0693 (0.1197)
Severe accidents and disasters	0.0378 (0.0255)	0.0344 (0.0260)	0.0279 (0.0236)
Criminal victimization	0.0090 (0.0344)	0.0158 (0.0358)	0.0211 (0.0321)
Serious diseases and injury	-0.0249 (0.0192)	-0.0237 (0.0194)	-0.0449** (0.0177)
Nursing a family member	0.0629*** (0.0216)	0.0567** (0.0220)	0.0358* (0.0204)
Socioeconomic factors	No	Yes	Yes
Psychological factors	No	No	Yes
<i>N</i>	4345	4345	4345
<i>R</i> <sup>2</sup>	0.008	0.048	0.215

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B.1: Comparison with other big events

## C Alternative dependent variable

### Alternative Question in 2007:

To make sure that my result is not an artifact due to focusing on a particular outcome, I use another measure of support for redistribution. I use the five-point response to the statement "Improvement of social welfare like pension and elderly medical care should be supported even under difficult financial situations." I drop samples who do not report their response on this issue, leaving me with 4548 samples.

Figure C.1 replicates Figure 1 with the alternative measure of support for redistribution. In my data, most people at least somewhat agree with this statement and so the entire shape of the response distribution is different. Importantly, however, the bullied people are more likely to support redistribution. Indeed, the mode of the distribution is different. The effect is also substantial: the bullied people tend to be 6.1pp more likely to unambiguously agree with the statement.

Now I turn to the regression analysis. Inspecting Figure C.1 suggests that the important margin of responses in this question is the *extent* of the agreement, rather than whether agreeing with the statement or not. Throughout this section, the dependent variable is a dummy (*redistribution*) that takes 1 if (unambiguously) agree with the statement. The dummy takes 0 otherwise. The regression equation is (1), the same equation as in the main text.

Table C.1 replicates the regression results in Table 1. In general, both qualitative and quantitative implications are similar, suggesting that all relevant results in this paper is robust to an alternative measurement of support for redistribution.

### Synthetic Index of Support for Redistribution:

Using the two questions that measure support for redistribution, I can construct a synthetic index for it. A natural way to do this is to add up the 5-point responses to the two questions, yielding an index ranging from 2 to 10.<sup>23</sup> The smaller number means the stronger support for redistribution. Figure C.2 plots this index. Again, the positive association with school bullying is visually apparent.

I now formalize the argument by the regression analysis. While I use the linear probability model (1) as in my main analysis, I should determine which cut-off value should I use in defining a binary outcome variable. I experiment with several thresholds: I define responses equal to or less than the threshold  $x$  as supporting redistribution (i.e., the dummy takes 1) and not supporting it otherwise, where I try several values of  $x$ . For simplicity, I stick with the simple regression (as in column 1 of Table 1).

Table C.2 presents the results using various cut-off values. In column 1, only observations exhibiting the definite support for both statements are defined as supportive of redistribution. The threshold gradually increases as the column number increases. It can be seen that the result is large and statistically

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<sup>23</sup>Since I should have non-missing responses to both questions, the sample size becomes 4271.

significant at 1% level until the threshold  $x = 4$ . When the threshold reaches 5, however, the magnitude decreases and the statistic significance is only at the 10% level. The estimated coefficient is maximized when the fraction of people classified as supportive of redistribution is around 0.5 (column 3). This might be natural as 4 and 5, which are the critical values of the classification, have many observations (see Figure C.2).<sup>24</sup> Thus, the effect of bullying would translate into a large change in many people's classifications. Overall, the positive association with school bullying is robustly observed.

### **The Same Question Asked in 2015:**

To see whether the positive association with school bullying is persistent over time, I exploit the panel nature of the JLPS. In the JLPS 2015 (wave 9), which is the latest wave available, the respondents were asked the same question about support for redistribution as the main outcome variable: "It is the government's responsibility to reduce income disparity." For comparability, I focus on 2419 observations that answered this question both in 2007 and 2015. To document the pattern of the data, I use the simple regression (as in column 1 of Table 1).

In this sample, the estimate is 0.0553 (s.e. 0.02404,  $p \simeq 0.021$ ) when the outcome variable in 2015 is used, while it is 0.0628 (s.e. 0.2402,  $p \simeq 0.010$ ) when the outcome variable in 2007 is used. These two estimates are close and statistically indistinguishable, implying that the impact of school bullying does not seem to shrink over time.

### **Alternative Cutoff on the 2007 Outcome Variable**

In the regression analysis in the main text, the dependent variable is a dummy (*redistribution<sub>i</sub>*) that takes 1 if person  $i$  agrees or somewhat agrees with the statement "It is the government's responsibility to reduce income disparity." The dummy takes 0 otherwise. This definition is justified because only a small fraction of people express the disagreement regardless of the bullying experience (see Figure 1 in the paper).

In this section, I alter the cutoff value in defining the binary outcome variable. More specifically, I re-define *redistribution<sub>i</sub>* as taking 1 if person  $i$  unambiguously agrees with the statement "It is the government's responsibility to reduce income disparity." The dummy takes 0 otherwise. Thus, those who somewhat agree with the statement is now classified as not supporting redistribution.

Table C.3 replicates Table 1 in the main text with the alternative binary outcome variable. Again, the positive association with school bullying is observed in all specifications. The magnitude of the estimate is somewhat smaller than the main results in Table 1 in the main text. This pattern might be expected because this alternative cutoff discards the effect that the bullying might move people from remaining neutral to somewhat agreeing with the statement, which is expected by the visual inspection of Figure 1

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<sup>24</sup>Analogously, the estimate is quite close to zero when the threshold value is larger than 5 (not reported). It is presumably because there are few people around such thresholds.

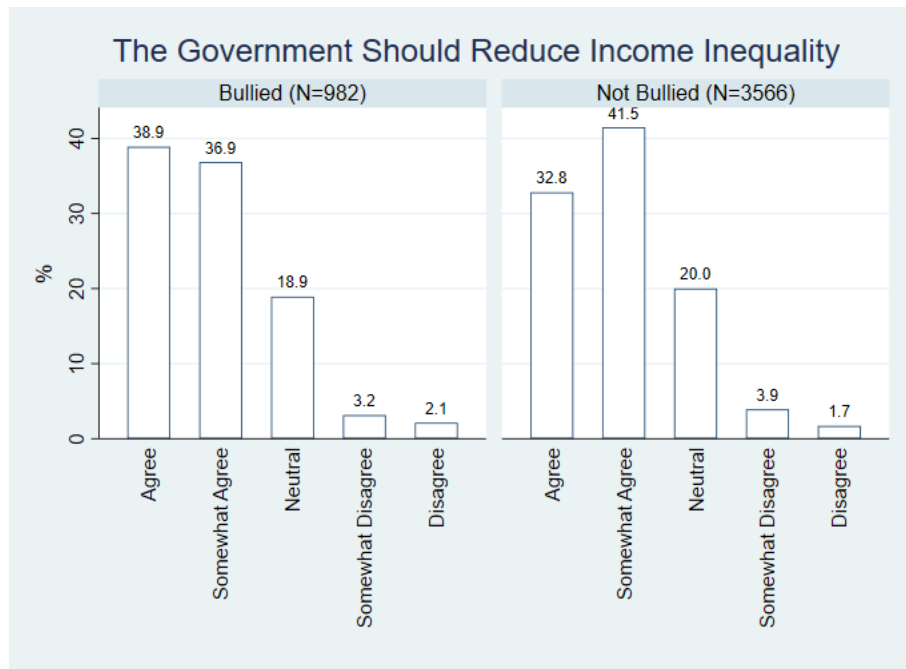


Figure C.1: Support for Redistribution by the Experience of Being Bullied: Alternative dependent variable

in the main text.

Another alternative cutoff is that  $redistribution_i$  that takes 1 if person  $i$  disagrees or somewhat disagrees with the statement “It is the government’s responsibility to reduce income disparity,” and the dummy takes 0 otherwise. I do not find any statistically meaningful effect using this definition. This is, however, natural given that only a few people express the disagreement with the statement regardless of the bullying experience (see Figure 1 in the paper). Put differently, this cutoff would throw away almost all the meaningful margin the bullying experience might have on the support for redistribution.

	(1)	(2)	(3)	(4)
Bullied at school	0.0606*** (0.0174)	0.0492*** (0.0179)	0.0414** (0.0175)	0.0442** (0.0179)
Oster’s lower bound	N/A	0.0452	0.0366	0.0419
Socioeconomic factors	No	Yes	Yes	Yes
Psychological factors	No	No	Yes	Yes
Other misfortunes	No	No	No	Yes
$N$	4548	4548	4548	4548
$R^2$	0.003	0.040	0.121	0.125

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table C.1: Regression analysis: Alternative dependent variable

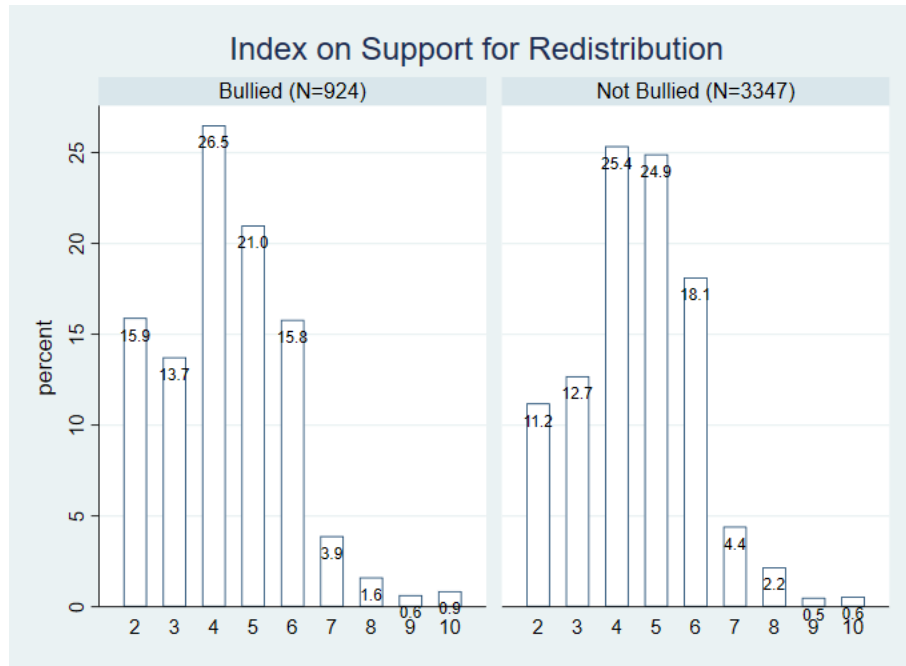


Figure C.2: Support for redistribution by the experience of being bullied: Synthetic index

	(1)	(2)	(3)	(4)
Bullied at school	0.0471*** (0.0132)	0.0575*** (0.0167)	0.0690*** (0.0185)	0.0298* (0.0157)
Threshold	2	3	4	5
Fraction of support for redistribution	0.122	0.256	0.508	0.748
<i>N</i>	4271	4271	4271	4271

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table C.2: Regression analysis: Synthetic index for support for redistribution

	(1)	(2)	(3)	(4)
Bullied at school	0.0517*** (0.0152)	0.0457*** (0.0155)	0.0349** (0.0142)	0.0370** (0.0147)
Socioeconomic factors	No	Yes	Yes	Yes
Psychological factors	No	No	Yes	Yes
Other misfortunes	No	No	No	Yes

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table C.3: Regression results: Alternative cutoff for the outcome variable

	(1)	(2)	(3)	(4)
Agree	0.0375*** (0.0109)	0.0330*** (0.0110)	0.0239** (0.0098)	0.0236** (0.0101)
Somewhat agree	0.0176*** (0.0051)	0.0155*** (0.0051)	0.0109** (0.0045)	0.0108** (0.0046)
Neutral	-0.0261*** (0.0076)	-0.0230*** (0.0077)	-0.0170** (0.0070)	-0.0167** (0.0072)
Somewhat disagree	-0.0160*** (0.0047)	-0.0142*** (0.0047)	-0.0100** (0.0041)	-0.0099** (0.0042)
Disagree	-0.0130*** (0.0038)	-0.0112*** (0.0038)	-0.0079** (0.0032)	-0.0078** (0.0033)
Socioeconomic factors	No	Yes	Yes	Yes
Psychological factors	No	No	Yes	Yes
Other misfortunes	No	No	No	Yes

Robust standard errors in parentheses  
\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table D.4: Marginal effects of bullying in the ordered probit model

## D Alternative Specifications

### D.1 Ordered Probit Model

In the JLPS data, the support for redistribution (the outcome variable) is measured by the 5-point Likert scale response. I binarize it the main analysis. In this section, I work on the original 5-point Likert scale by utilizing the ordered probit model. A benefit of this specification is that I can check which response the bullying has the largest impact.

Table D.4 reports the (average) marginal effect of school bullying.<sup>25</sup> First, the bullying has a positive association with “agree” or “somewhat agree” while it has a negative association with the other responses. This is consistent with my main finding that being bullied at school increases the support for redistribution. Second, The marginal effect (in percentage points) is larger on the response “agree” than “somewhat agree.” This implies that school bullying might have a larger association with the unambiguous support for redistribution. Finally, the negative effect is largest on “neutral” on the negative answers. This is presumably because few people express the negative expression regardless of the bullying status (see Figure 1 in the paper). Thus, the main margin of the bullying effect is whether a person supports redistribution or not. Overall, these results are consistent with my main findings.

<sup>25</sup>The marginal effects are computed for each observation and then averaged.

## D.2 Propensity Score Matching

Since I have included many covariates in some specifications, it might be worthwhile to consider propensity score matching estimator to save the degree of freedom. I estimate the specification with socioeconomic factors, psychological factors, and other misfortunes are controlled (i.e., column 4 of Table 1 in the main text). This is the model with the largest number of controls and so the benefit of using propensity score matching would be salient. I use the logit model in predicting the probability of being bullied. I then pick up ten nearest neighbors based on the propensity score and compute the average treatment effect.

The estimated average treatment effect is 0.0742 (s.e. 0.0165,  $p \simeq 0.000$ ) so that the self-reported experience of being bullied at school has a strong positive association with support for redistribution, both economically and statistically. Compared with column 4 in Table 1, the estimate is somewhat larger.<sup>26</sup> Overall, using propensity score matching does not change my conclusions.

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<sup>26</sup>I have also tried the propensity score estimator without controlling for misfortunes. The estimate is 0.0586 (s.e. 0.0183,  $p \simeq 0.001$ ), which is somewhat larger than the estimate in column 3 of Table 1 in the main text.

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