

## Research Article

# Exploring factors explaining the scarcity of climate protests in East Asia

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Despite the surge of climate protests (e.g., Fridays For Future) in Western countries, climate protests in East Asia had been scarce. To explore potential reasons for the scarcity of climate protests in East Asia, this study aimed to identify factors that were correlated with the significance of protests by a cross-country analysis. We found correlations of the significance of protests with the density of non-governmental organizations (NGOs), working hours, trust in strangers, and priority of the environment over economy. Although previous studies had already identified the density of NGOs and priority of the environment over economy as important factors, this study identified two novel factors that were related to personal and interpersonal resources (i.e., working hours and trust in strangers). Based on these results, this study discussed underlying mechanisms of the scarcity of climate protests in East Asia and proposed alternative social movements that might be effective in East Asia.

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## Introduction

Climate actions including protests have been attracting much international attention recently (Neves, 2020; Taylor & Watts, 2019). Fridays For Future, an international protest started by Greta Thunberg in August 2018, demanded action from political leaders to prevent climate change. This movement grew continuously and gathered 7.6 million people worldwide in September 2019 (Connell et al., 2019; de Moor et al., 2020; Neuber et al., 2021). This movement, backed by many scholars, policymakers, and educators (Marris, 2019; Schiermeier et al., 2019), has been affecting both international and national policymaking (Marquardt, 2020; Neuber et al., 2021). Indeed, Thunberg had been given numerous speeches before politicians and economic elites in the European Parliament, the United Nations, and others.

Besides political outcomes, climate protests delivered educational outcomes. Climate protests provided 'learning' opportunities for participants. Scholars observed enhanced concern and pro-environmental behavior of protest participants (Barbosa et al., 2021; Neuber et al., 2021; Xie et al., 2019). More importantly, participants recognized the power of collective action that was an essential element for effective civic engagement (Deisenrieder et al. 2020; McCloskey, 2019). Climate protests further provided 'teaching' opportunities for participants. Through protests, youth participants had opportunities to influence on awareness and behavior of surrounding others including parents and teachers (Biswas & Mattheis, 2022; Deisenrieder et al. 2020; Sisco et al., 2021). Although adults educate children traditionally, climate protests reversed the roles of adults and children in education (Barracough et al., 2021; Fisher, 2019; Marris, 2019). This reversal might be extremely important from a cultural perspective. Traditional education often reproduces existing culture that can be incompatible with sustainability and prevent us from making necessary social change for sustainability (Komatsu et al., 2020, 2021; Silova et al., 2019). Climate protests thus can be a starting point of rearticulating the existing mainstream culture, which had been foreseen by many critical scholars for years (Bowers, 1995; Komatsu et al., 2019; Plumwood, 1993; Rappleye & Komatsu, 2020a; Schumacher, 1973).

Against this backdrop, this study highlights the scarcity of climate protests in East Asian countries. East Asian countries had fewer protests than Western countries (Mesimäki, 2019; Chang, 2022) despite their relatively large impacts on both global and local environments (Hickel, 2020; O'Neil et al., 2018). The scarcity of protests in several East Asian countries (e.g., China) would be attributable to the lack of democracy. However, this would not explain why Japan, Korea, and Taiwan had fewer protests than Western countries. Similarly, the level of education would not explain the scarcity of climate protests in East Asia. The average level of environmental literacy of East Asian youths is actually higher than that of Western youths (Komatsu et al., 2021; OECD, 2009). More importantly, we cannot conclude that East Asian people are simply bad at collective action. East Asian people have been successfully combating the Covid-19 crisis through collective actions (e.g., wearing masks, following mobility restrictions, and keeping social distancing, Rappleye et al., 2021; Sachs, 2021; Silova et al., 2021).

As a first step to explore reasons for the scarcity of climate protests in East Asia, this study aims to identify factors that are correlated with the significance of protests by a cross-country analysis. However, we do not necessarily assume that East Asia should have more climate protests. Climate protests are merely one of many possible climate actions. One climate action that is effective in a particular region

would not be necessarily effective in another region due to structural and cultural differences between the regions. This study rather aims to contemplate what kind of climate actions are effective in East Asia. Very few studies have examined potential reasons for the scarcity of climate protests in East Asia despite the presence of many studies examining climate protests in Western countries (e.g., Cologna et al., 2021; Emilsson et al., 2020; Haugestad et al., 2021; Martiskainen et al., 2020; Neuber et al., 2021). We found two pioneering studies that compared climate protests for different countries including East Asian countries (Laux, 2021; Prendergast et al., 2021). Although these pioneering studies give many implications for this study, none of these two studies focused on the contrast between East Asia and the West. In Laux's (2021) cross-country analysis, the most significant contrast in the significance of climate protests was observed between African countries (i.e., Ghana and Tunisia) and Western countries (e.g., Australia, New Zealand, Spain, and the United States). Although their analysis included two East Asian countries, their findings might be strongly affected by the data for the two African countries. Prendergast et al. (2021) explicitly focused on the contrast between cities in Global North and those in Global South rather than between cities in East Asian countries and in Western countries. Furthermore, the only city from East Asia (Yokohama, Japan) often lacked data that were important for their comparative analysis. To our best knowledge, no studies have thus attempted to identify factors explaining the fewer climate protests in East Asian than in the West.

## Materials and Methods

### *Theory*

The theoretical foundation of this study is Resource Mobilization Theory (RMT). Since its development in the 1970s, RMT has been a major theory to examine reasons for a success in social movements (Edwards & Gillham, 2013; Jenkins, 1983; Klandermans, 1984). The basic assumption of RMT is that social movements develop when individuals have sufficient resources to take action.

Klandermans (1984) conceptualizes the key points of RMT in a succinct way. One will participate in a social movement (1) if one knows the opportunities to participate, (2) if one is capable of using these opportunities, and (3) if one is willing to do so. We use this conceptualization and review previous studies to list potential factors for the success of climate protests (see the next subsection).

### *Knowledge about opportunities*

Building on Klandermans (1984) and reviewing previous studies related to climate actions including climate protests, we chose the factors listed in **Table 1** as factors potentially affecting the significance of climate protests. In order one to know the opportunities to participate in climate protests, information about the opportunities should be disseminated in the society and one should be accessible to the information. Grass-root environmental organizations played an important role in disseminating information about climate protests in several countries (Gorman, 2021). Non-governmental organizations (NGOs) also supported the protests and disseminated information (Taylor & Syal, 2019). We thus used data for the ratio of active members of environmental organizations in a society (World Value Survey Wave 7, Haerpfer et al., 2020) and the number of NGOs admitted by UNFCCC (2022) per 1 million people (i.e., the density of NGOs). This was in align with previous studies that suggested membership of environmental organizations and the density of NGOs were important factor predicting climate protest participation (Haugestad et al., 2021; Laux, 2021).

Factors	Description	Data source
<i>Knowledge about the opportunity</i>		
<b>Membership of environmental organizations</b>	The ratio of (both active and inactive) members of environmental organizations to the total population	World Value Survey Wave 7 (Haerpfer et al., 2020)
<b>Density of NGOs (i.e., number of NGOs admitted by UNFCCC per 1 million people)</b>	The number of NGOs listed in the UNFCCC website.	UNFCCC (2022)
<i>Capability of using the opportunity</i>		
<b>Working hours</b>	Working hours in 2017	Our World in Data (Giattino et al., 2020)
<b>Subjective health condition</b>	The percentage of those who chose 'very good' and 'good' among the response options.	World Value Survey Wave 7 (Haerpfer et al., 2020)
<b>Trust in strangers</b>	The percentage of people who trust in those who one first meets	World Value Survey Wave 7 (Haerpfer et al., 2020)
<i>Willingness to use the opportunity</i>		
<b>Threat (1)</b>	Percentage of those who believe that climate change is a serious personal threat	Gallup Poll (Pelham, 2009; Pugliese & Ray, 2009)
<b>Threat (2)</b>	Percentage of those who believe that climate change is harming or will harm people	Pew Research Center (2015)
<b>Threat (3)</b>	Percentage of those who concern if climate change will harm you personally at some point in your lifetime	Pew Research Center (2015)

Factors	Description	Data source
Threat (4)	The percentage of those who believe in climate emergency	UNDP (2021)
Priority of the environment over economy	The percentage of people who want to prioritize environmental protection over economic growth	World Value Survey Wave 7 (Haerpfer et al., 2020)
Tertiary education attainment	The percentage of 25–64 year olds who received tertiary education	OECD Stats (2022); Hsueh (2018)
Confidence in environmental movements	The percentage of people who are confident in environmental protection movements	World Value Survey Wave 7 (Haerpfer et al., 2020)

**Table 1.** Factors considered and data used in this study.

Although Laux (2021) reported that the internet accessibility was reported to be one important factor predicting the significance of climate protests among countries, we did not consider this factor in our analysis. The reason was that internet accessibility did not differ considerably among the countries that we focused on in this study because of relatively high economic standards.

### *Capability for using the opportunities*

In order one to use the opportunities to participate in climate protests, one should have sufficient personal resources (e.g., time and energy). RMT traditionally regarded time and energy as important factors affecting the success of social movements (e.g., Jenkins, 1983; Klandermans, 1984). To evaluate the availability of these personal resources such as time and energy, we used data for annual working hours (Our World in Data, Giattino et al., 2020) and subjective health conditions (World Value Survey Wave 7, Haerpfer et al., 2020).

Besides personal resources, one should have sufficient interpersonal resources. One reason is that people often participate in social movement such as protests, because they are asked to do so (Schussman & Soule, 2005). This also seemed to be the case for recent climate protests according to de Moor et al.'s

(2020) survey. To evaluate the level of interpersonal resources, we used data for trust, i.e., the ratio of people who trusted in strangers (World Value Survey Wave 7, Haerpfer et al., 2020).

### *Willingness to use the opportunities*

In order one to be willing to use the opportunities, one first needs to understand the value of the potential outcome of their action. In our context, one would need to feel the threat to climate change and want to prioritize the environment over other issues (e.g., economic ones). This point had been addressed by many previous studies on climate protest participants (e.g., Boyes & Stanisstreet, 2012; Brügger et al., 2020; Deisenrieder et al., 2020; Metag et al., 2017).

We used data for threat to climate change derived from three different surveys and the ratio of people who wanted to prioritize environmental protection over economic issues (World Value Survey Wave 7, Haerpfer et al., 2020). The reason we used data for threat derived from three different surveys was that all these surveys had advantages and disadvantages. Gallup Poll (Pelham, 2009; Pugliese & Ray, 2009) included all the four East Asian countries that we focused in this study (Japan, Korea, Singapore, and Taiwan), but the data was old. Pew Research Center (2015) asked two different questions about threat to climate change, which would allow a better interpretation of the phenomenon. However, Pew Research Center (2015) lacked data for Singapore and Taiwan. UNDP (2021) collected data very recently, but included only Japan among the East Asian countries.

In order one to be willing to use the opportunities of climate protests, one also needs to believe in the possibility that their action will bring an expected outcome (i.e., instrumentality of their action). This point had been emphasized not only by social theorists, but psychologists (e.g., Bamberg et al., 2015, 2018). Indeed, studies in a Western country context observed a higher level of belief in the instrumentality among climate protest participants (e.g., Brügger et al., 2020; Haugestad et al., 2021). To assess the instrumentality, one would first need to have the capacity to form an opinion about climate protests. One would then need to believe that environmental movements can make a difference. To represent the capacity to form an opinion, we used 2019 data for the ratio of people between ages 25 and 64 who received higher education (OECD Stats, 2022). To represent the belief in environmental movements, we used data for the ratio of people who were confident in environmental movements (World Value Survey Wave 7, Haerpfer et al., 2020). Data for the ratio of people who received higher education for Taiwan was unavailable in OECD Stats (2022). We thus used an equivalent data recorded in 2015 (Hsueh, 2018).

## *Methods of analysis*

We included Japan, Korea, Singapore, and Taiwan as East Asian samples. These countries were categorized as either “full democracy” (Japan, Korea, and Taiwan) or “flawed democracy” (Singapore) by the 2019 Democracy Index (Economist Intelligence Unit, 2020). We excluded China, Hong Kong, and North Korea, because these countries were categorized as countries with “hybrid regime”. As Western counterparts, we chose countries that had joined the Organisation for European Economic Co-operation (OECD) by the 1970s and were categorized as either “full democracy” or “flawed democracy”. These criteria allowed us to focus on countries that had broad, baseline similarities in their political and economic institutions. Although we used the Democracy index to choose countries, using other datasets (e.g., V-Dem Institute, 2019; Freedom House, 2022) did not change our conclusions qualitatively.

This study started with confirming that East Asian countries had fewer climate protests than Western countries. For this confirmation, we used the number of climate protests reported in the Fridays For Future (2022) website. We used the total number of climate protests during 2018–2019. We did not consider data in 2020 and afterwards. The reason was that climate protests in 2020 and afterwards were often affected by the Covid crisis (Buettner, 2020; Fisher & Nasrin, 2020; Neuber et al., 2021).

This study then identified factors that were systematically different between East Asian and Western countries. The difference was assessed using Glass’s delta, an effect-size parameter defined by the difference in the means for the two groups divided by the standard deviation for the control group (Ellis, 2010; Glass et al., 1981).

This study further examined the strength of relationships between identified factors and the number of protests per 1 million people. As the number of protests per 1 million people differed considerably among countries, we took the common logarithm of the number for this examination. We then calculated the Pearson correlation coefficient ( $r$ ) between each factor and the common logarithm of the number of protests per 1 million people. To examine the stability of  $r$ , we also calculated upper and lower 95% confidence intervals (CIs) of  $r$  values using a bootstrapping method with replacement (Diaconis & Efron, 1983; Fox, 2008). This calculation was conducted using JASP, an open-source statistical software supported by the University of Amsterdam (<https://jasp-stats.org/getting-started/>). We note that calculation of a bootstrapping CI does not require assumptions about the underlying statistical distribution, unlike the calculation of a parametric CI.



This study also investigated how much each identified factor contributed to explaining the number of climate protests per 1 million people. Specifically, we developed multiple-regression models that considered different sets of factors. The fitness of a model was assessed using the determination coefficient ( $r^2$ ) and adjusted  $r^2$ . Adjusted  $r^2$  assess the explanatory power of the models with considering the number of variables considered.

Throughout our analysis, we did not perform hypothesis testing. Statistical significance is not always meaningful in a practical context. A very weak relationship or a very small difference can be found to be statistically significant, if we have a sufficiently large number of samples. This

problem has long been noted by prominent statisticians (e.g., Berkson, 1938) and has again become a concern in recent years (Komatsu & Rappleye, 2017a,b; Thompson, 2002). Instead of significance reporting, it is recommended to report effect sizes such as  $r$  and Glass' delta, an approach we take herein.

### *Comparison with Laux's and Prendergast et al.'s studies*

As we mentioned in the introduction, both Laux (2021) and Prendergast et al. (2021) did not focus on the difference between East Asia and the West in their analysis. However, these studies gave many implications for choosing factors to be considered in this study. We included almost all the factors that were identified as important in these studies. Laux (2021) identified the density of NGOs and priority of the environment over economy, besides accessibility to the Internet, as important factors. Prendergast et al. (2021) identified civic skills and organizational membership as important factors. All these factors except civic skills were considered in this study. Civic skills were not considered, because international data for civic skills were unavailable.

One novelty of this study was that it considered trust in strangers as one factor. Such a cultural dimension was often overlooked in previous studies. However, considering a cultural dimension would be critical when one compares East Asia and the West (see Chang, 2022). Those in East Asia might have a different perception about strangers from those in the West. Individualism in East Asia is weak and therefore those in East Asia tend to clearly distinguish those who are familiar with and those who they first meet (Markus & Kitayama, 1991, 2010; Triandis et al., 1988; Yamagishi et al., 1998). This distinction would not be so important for those in the West with strong individualism. This issue of individualism would be revisited in the discussion section.

## Results

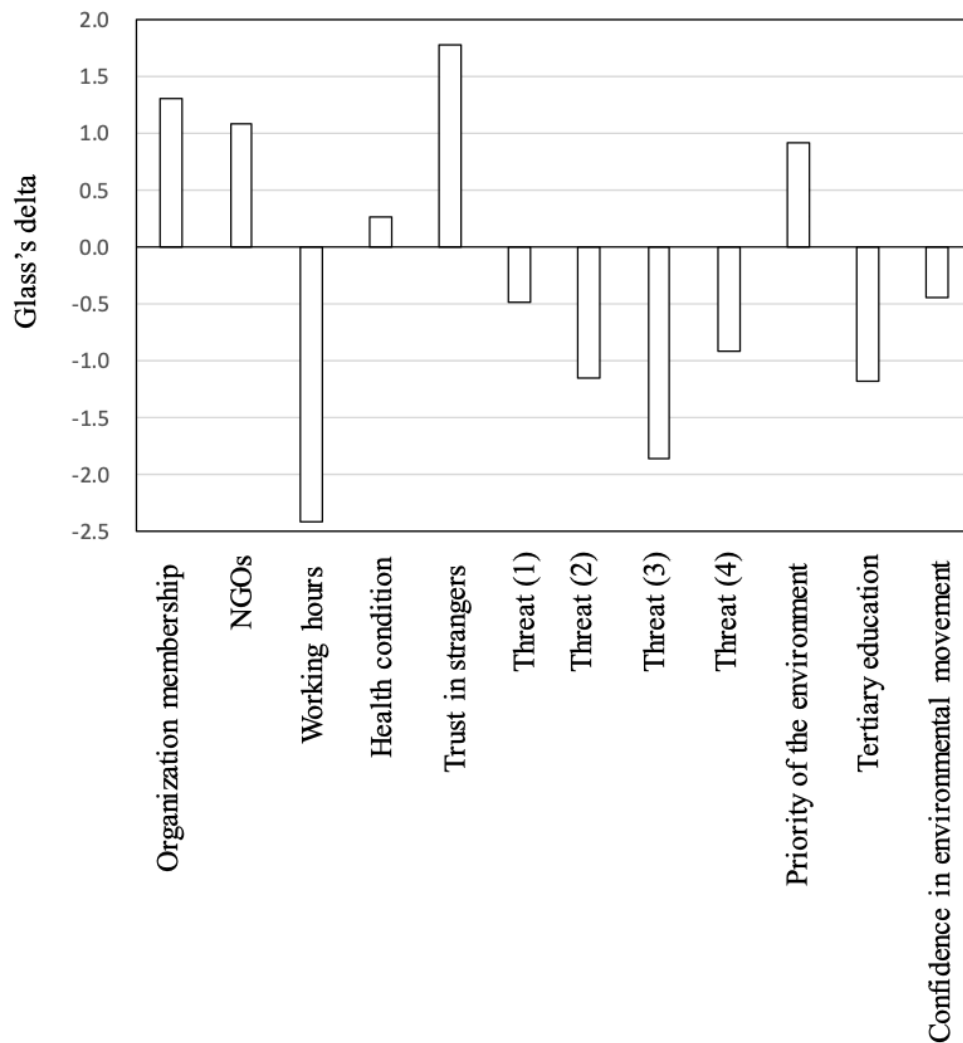
The number of climate protests per 1 million people for East Asian countries ranged between 0.32 (Japan) and 1.26 (Taiwan, **Table 2**). The number for Western countries ranged between 4.9 (Greece) and 80.4 (Sweden). Glass's delta for the difference in the logarithm of the number of climate protests per 1 million people was 3.95. Climate protests were thus considerably scarce in East Asian countries despite the presence of democracy in these countries.

Factors	Japan	Korea	Singapore	Taiwan	Mean (East)	Mean (West)	SD (West)	Glass's delta
<i>Significance of protests</i>								
Number of climate protests per 1 million people	0.32	0.59	1.02	1.26	0.79	20.50		
Log of the number of climate protests	-0.49	-0.23	0.01	0.10	-0.15	1.17	0.33	3.95
<i>Knowledge about the opportunity</i>								
Membership of environmental organizations	1.4	5.1	4.9	16.3	6.9	13.4	5.0	1.31
Density of NGOs	0.52	0.47	0.85	0.21	0.51	3.31	2.58	1.08
<i>Capability of using the opportunity</i>								
Working hours	1738	2063	2238	1990	2007	1627	158	-2.42
Subjective health condition	51.2	90.4	72.0	64.5	69.5	71.0	5.7	0.26
Trust in strangers	10.4	17.5	18.0	25.3	17.8	48.3	17.1	1.78
<i>Willingness to use the opportunity</i>								
Threat (1)	80		59	70	70	63	15	-0.48
Threat (2)	86	93			90	80	8	-1.16
Threat (3)	82	89			86	64	11	-1.87
Threat (4)	79				79	74	6	-0.92
Priority of the environment over economy	33.6	57.4	55.8	63.2	52.5	60.5	8.7	0.92
Tertiary education attainment	48	45		45	46	37	8	-1.18

Factors	Japan	Korea	Singapore	Taiwan	Mean (East)	Mean (West)	SD (West)	Glass's delta
Confidence in environmental movements	44.1	64.8	62.6	71.9	60.9	58.4	5.6	-0.44

**Table 2.** Factors considered and data used in this study.

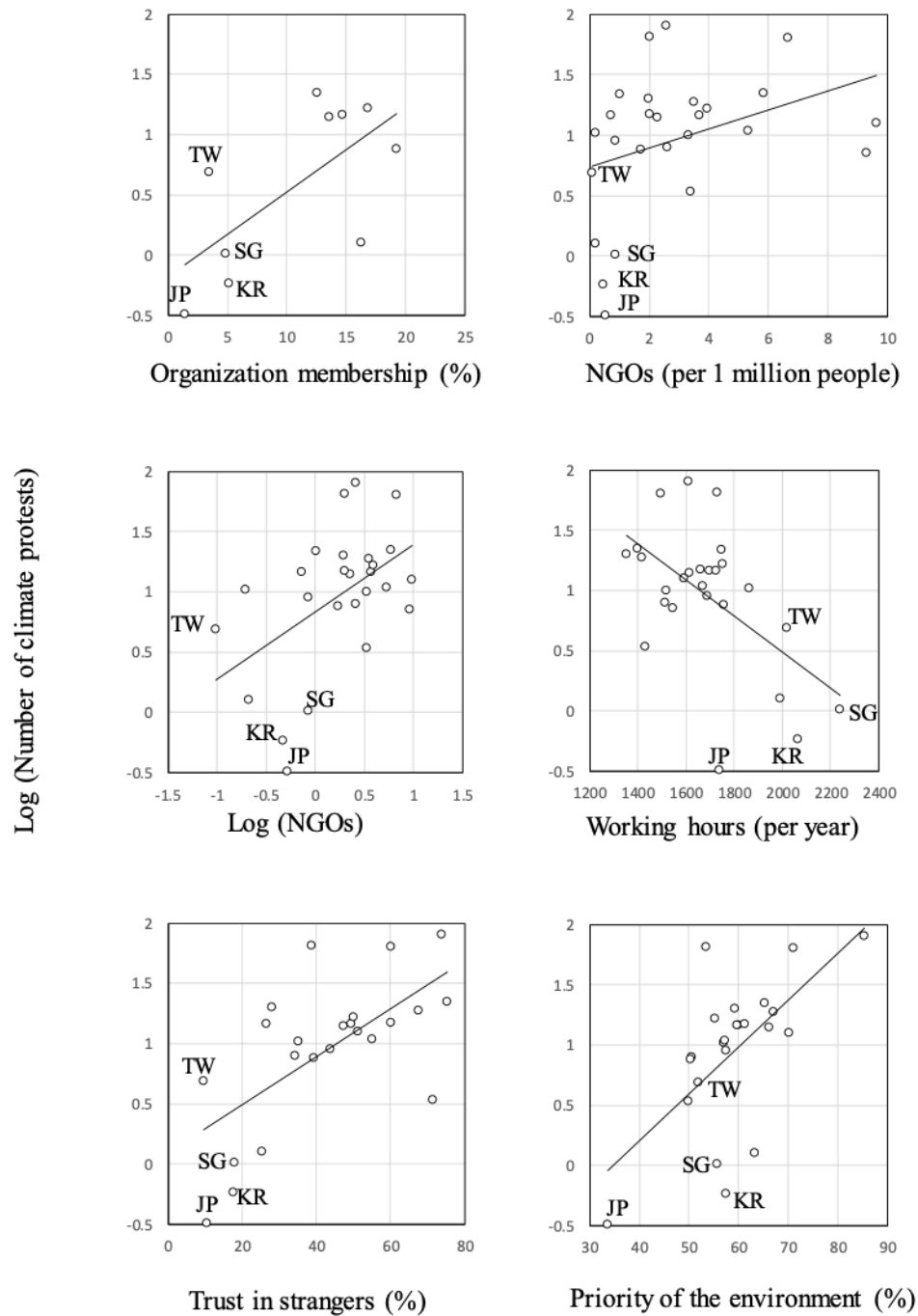
Between East Asia and the West, we observed systematic differences in membership of environmental organizations (delta = 1.31, **Figure 1**), the density of NGOs (delta = 1.08), working hours (delta = -2.42), trust in strangers (delta = 1.78), and the priority of the environment over economy (delta = 0.92). State of health was lower for East Asian countries, but the difference was small (delta = 0.26). Other factors differed, but East Asian countries had more favorable numbers than Western countries (e.g., a higher threat perception for East Asian countries than for Western countries).



**Figure 1.** Differences in various factors between East Asia and the West (i.e., West minus East Asia).

We observed moderate to strong correlations between the identified factors and the number of climate protests per 1 million people. The correlation between membership of environmental organizations and the significance of climate protests was strong (i.e.,  $r = 0.669$  with a CI of [0.047, 0.966], **Figure 2a**). The relatively large CI was primarily due to the small sample size (10), which forced us to drop this factor from following analyses (note: many countries lacked data for membership of environmental organizations). Although the correlation between the density of NGOs and the protest significance was weak ( $r = 0.355$  with a CI of [0.062, 0.620]), the relationship became stronger when we took the common logarithm of the density of NGOs ( $r = 0.498$  with a CI of [0.270, 0.705], **Figures 2b and 2c**). Strong correlations were observed for the relationships with working hours ( $r = -0.558$  with a CI of [-0.787, -0.223], **Figure 2d**),

with trust in strangers ( $r = 0.648$  with a CI of [0.307, 0.862], **Figure 2e**), and with priority of the environment over economy ( $r = 0.621$  with a CI of [0.153, 0.848], **Figure 2f**).



**Figure 2.** Relationships of the number of climate protesters (per 1 million, log scale) with (a) organization membership, (b) the number of NGOs per 1 million people (normal scale), (c) the number of NGOs per 1 million people (log scale), (d) working hours, (e) trust in strangers, and (f) priority of the environment over economy. Data for Japan (JP), Korea (KR), Singapore (SG), and Taiwan (TW) are indicated.

Among the factors identified, we found relatively strong correlations between the density of NGOs, working hours, and trust in strangers (**Table 3**). The correlations of these factors with priority of the environment was weaker. That is, the density of NGOs, working hours, and trust in strangers largely moved together, whereas priority of the environment moved rather independently.

	Log (NGOs)	Working hours	Trust in strangers	Priority of the environment
Log (NGOs)	1.00			
Working hours	-0.708 [-0.857, -0.554]	1.00		
Trust in strangers	0.755 [0.611, 0.864]	-0.685 [-0.909, -0.380]	1.00	
Priority of the environment	0.374 [0.094, 0.624]	-0.256 [-0.533, -0.007]	0.584 [0.193, 0.805]	1.00

**Table 3.** Correlation coefficients [Confidence Intervals (CIs)] between factors identified.

When using one of the three factors including the density of NGOs, working hours, and trust and priority of the environment as inputs, explanatory power measured by adjusted  $r^2$  was relatively high (Models 1–3, **Table 4**). Adjusted  $r^2$  values were typically about 0.5. Due to the strong correlations, considering two or more factors among the three did not improve the explanatory power (Models 4–7, **Table 4**). Adjusted  $r^2$  values were again typically about 0.5.



Model	Factors considered				$r^2$	Adjusted $r^2$
	Log (NGOs)	Working hours	Trust in strangers	Priority of the environment		
#1	v			v	0.503	0.453
#2		v		v	0.580	0.538
#3			v	v	0.509	0.459
#4	v	v		v	0.584	0.518
#5	v		v	v	0.526	0.451
#6		v	v	v	0.585	0.519
#7	v	v	v	v	0.586	0.494

**Table 4.** Explanatory power of different sets of factors for protest significance.

## Discussion

### *Comparison with previous studies*

Previous cross-country studies mainly focused on factors related to knowledge about protest opportunities (e.g., the density of NGOs) and willingness to use the opportunities (e.g., priority of the environment over economy) to explain between-country variations in the significance of climate protests (Laux, 2021; Prendergast et al., 2021). Besides these factors, this study identified factors for capability of using the opportunities (e.g., working hours and trust in strangers, **Table 2; Figure 1**). This is an apparent addition to existing literature. Our findings are in align with our unpublished survey data. We asked 130 Taiwanese about factors that would allow them to participate in climate protests. Among six available options, the highest ratio of respondents (34%) chose the one related to interpersonal relationships (i.e., “if a friend would attend with me”) and the second highest ratio (33%) chose the option related to working hours (i.e., “if I do not need to work/study so much”). Our findings are also partly supported by an ethnographic study conducted in Taiwan (Chang, 2022). Chang (2022) interviewed Taiwanese youths for factors preventing them from conducting climate protests. She reported that many interviewees mentioned limited time due to long learning hours as one of the most important factors.

This meshes with quantitative data that demonstrate longer learning hours of East Asian teenagers than Western teenagers with an exception of Japanese teenagers (Komatsu & Rappleye, 2018; Rappleye & Komatsu, 2018). Chang (2022) also mentioned that young activists in Taiwan needed to compromise because their teachers and parents feared potential friction between the activists and other people. This fear might be related to relatively low trust in strangers.

The factors raised above also explain why East Asian countries have handled the Covid-19 crisis relatively successfully (Rappleye et al., 2021; Sachs, 2021; Silova et al., 2021). Actions for handling the Covid-19 crisis (e.g., wearing masks, following mobility restrictions, and keeping social distancing) generally require neither time nor close collaboration with strangers. We might be able to explain the popularity of recycling in many East Asian countries (e.g., Korea, Singapore, and Taiwan, e.g., Resource, 2017; Zuckerman, 2020) in the same way. Recycling generally requires neither time nor close collaboration with strangers.

It is true the predictability of the protest significance did not improve when considering two or more factors among the density of NGOs, working hours, and trust in strangers (Table 4). This was primarily due to relatively strong correlations among these three factors (Table 3). However, this does not mean that our findings were unimportant. Adding working hours and trust in strangers to the list of potential factors would allow us to contemplate underlying processes, which is also an important achievement of this study (see below).

### *Underlying processes*

Although further studies are definitely needed, all these three factors might be related to one factor (i.e., the level of individualism). Indeed, our supplementary analysis found strong correlations between the three factors and individualism scores derived from Hofstede's Cultural Dimensions (Hofstede et al., 2010; Hofstede Insights, 2022). The correlation coefficients were respectively 0.720 (with a CI of [0.506, 0.852]), -0.699 (with a CI of [-0.850, -0.350]), and 0.612 (with a CI of [0.320, 0.786]) for the density of NGOs, working hours, and trust in strangers. Similar strong correlations were observed when using the data for individualism scores updated by Taras et al.'s (2012).

These correlations and existing literature allow us to speculate underlying processes. According to cultural psychology, one tends to clearly distinguish their in-group and out-group where individualism is weak (Markus & Kitayama, 1991, 2010; Triandis et al., 1988; Yamagishi et al., 1998). This clear distinction may be one reason for low trust in strangers in East Asian countries where individualism scores are low

(see Yamagishi & Yamagishi, 1994). This cultural perspective also explains longer working hours in East Asia. Where individualism is weak, one tends to have an emotional relationship with colleagues in their workplace, which can lead to longer working hours. Indeed, previous studies reported that those in regions with weak individualism tended to prefer teamwork and feel less stress with long working hours (Kiffin-Petersen & Cordery, 2003; Yang et al., 2012). Low trust in strangers may be also related to a lower density of NGOs. Waniak-Michalak & Perica (2021) reported that NGOs tended to receive a smaller amount of donation in regions where social trust was lower, although this study was conducted in a European country context. Future studies need to examine whether the same results are observed even when including data from East Asia.

### *Limitations*

This study is important in that it has not only identified potential factors explaining the scarcity of climate protests in East Asia, but generated ideas about underlying processes. However, this study has several limitations. One major limitation is that factors considered in our country-scale analysis were selected primarily based on previous studies conducted in Western country contexts (e.g., Deisenrieder et al. 2020; Neuber et al., 2021). The scarcity of studies on climate protests in East Asia has prevented us from examining whether these factors were enough or other factors should be also considered to explain climate protests in East Asia.

It would not be easy to examine differences between participants and non-participants of climate protests in East Asia in a quantitative way due to a very limited number of participants. Considering this situation, conducting ethnographic studies can be one alternative. Such ethnographic studies do not necessarily require large sample sizes. We have identified only one ethnographic study exploring potential factors for the scarcity of protests in Taiwan (Chang, 2022). Similar studies targeting other East Asian countries (i.e., Japan, Korea, and Singapore) should be conducted to explore other factors that may be related to the significance of climate protests in East Asia. Exchanges between ethnographic, small-scale studies and country-scale studies like ours are one effective way to improve our understanding about a target phenomenon (Heath, 2020; List & Spiekermann, 2013; Rappleye & Komatsu, 2020b).

### *Practical implications*

The results and discussion of this study might discourage those who want more climate protests in East Asia for social transformation. This study suggests that culture (i.e., weak individualism) in East Asia is

one reason for the scarcity of climate protests. Shifting a culture usually takes long time, although it is certainly possible (Markus & Conner, 2014).

We make following practical recommendations for social transformation in East Asia. First, readers should recall that climate protests are merely one of various climate actions. Some climate actions need only a lower level of interaction with strangers than climate protests. Indeed, one recent survey targeting Japanese people reported that although only 2.9% of respondents had participated in protests and demonstrations, 13.9% had participated in petitions and 14.1% in donation (Japanese Trade Union Confederation, 2021). The survey also reported that more people were willing to participate in petitions and donation in the future. This suggests that these actions might be more effective than climate protests for social transformation in East Asia. This also resonates with the point made by Chang (2022) and Jobin et al. (2021). Chang (2022) reported that Taiwanese young activists did not just borrow climate protests in the West, but transformed protests into alternative actions. For example, Taiwanese young activists made alliances with pro-environmental teachers in their school and successfully held events in their schools rather than out of their schools. Jobin et al. (2021) also suggested that societies with different conditions (e.g., political, social, cultural, and economic ones) may use different approaches for achieving high environmental performance. Both of Chang (2022) and Jobin et al. (2021) thus challenge the traditional perspective that assumes any differences observed between non-Western and Western countries as a sign for immaturity of non-Western countries.

Some readers, particularly educators in East Asian countries, may argue that having protests is one sign of healthy democracy and that the function of climate protests could not be substituted by alternative climate actions (see Jobin et al., 2021 for a related discussion). For those who take this position, we propose strengthening networks among people to develop a foundation for collective action. The rationale for this proposal is that unlike trust in strangers, trust in those who one knows personally is not low in East Asia (World Value Survey Wave 7, Haerpfer et al., 2020). Measures for strengthening networks have been already identified by many previous studies (e.g., Rubin, 2012; Stephan et al., 2015). These previous studies rarely aimed to strengthen networks for climate actions, but we can learn from these studies about how to connect people for climate actions. In our context, particularly important is to connect the ordinary public with key actors of climate protests like NGOs. Schools at all levels can invite those from NGOs to their classroom. This allows students to learn what NGOs think and do, which eventually leads to a higher trust in NGOs. Universities can run courses in which students collaborate

with those from NGOs. Such networking would allow students to be more responsive to the call of protests emitted by NGOs because of their personal connections with the NGOs.

Although weak individualism in East Asia might have been preventing the rise of climate protests, we also note that shifting culture to strengthen individualism should be carefully conducted. Weak individualism has environmental and social benefits (Komatsu et al., 2019, 2022a,b; Nisbett, 2003; Markus & Conner, 2014). Countries with weak individualism often have smaller environmental impacts and fewer social problems (Komatsu et al., 2019, 2020, 2021; Rappleye et al., 2021; Silova et al., 2021). Those with less individualistic orientation organize pro-social and pro-environmental behavior more frequently (Arnocky et al., 2007; Chuang et al., 2016; Duff et al., 2022; Piff et al., 2010). We are not saying that shifting culture is unnecessary in East Asia. However, we should consider the balance between advantages and disadvantages of individualism for greater social and environmental benefits.

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## **References**

- Arnocky, S., Stroink, M., & DeCicco, T. (2007). Self-construal predicts environmental concern, cooperation, and conservation. *Journal of Environmental Psychology*, 27(4), 255–264. <https://doi.org/10.1016/j.jenvp.2007.06.005>
- Bamberg, S., Rees, J., & Seebauer, S. (2015). Collective climate action: Determinants of participation intention in community-based pro-environmental initiatives. *Journal of Environmental Psychology*, 43, 155–165. <https://doi.org/10.1016/j.jenvp.2015.06.006>
- Bamberg, S., Rees, J.H., & Schulte, M. (2018). Environmental protection through societal change: What psychology knows about collective climate action—and what it needs to find out. In S. Clayton and C. Manning (eds.), *Psychology and Climate Change* (pp. 185–213). Academic Press. <https://doi.org/10.1016/B978-0-12-813130-5.00008-4>
- Barbosa, R., Randler, C., & Robaina, J. V. L. (2021). Values and Environmental Knowledge of Student Participants of Climate Strikes: A Comparative Perspective between Brazil and Germany. *Sustainability*, 13(14), 8010. <https://doi.org/10.3390/su13148010>

- Barraclough, A.D., Sakiyama, M., Schultz, L., & Måren, I.E. (2021). Stewards of the future: accompanying the rising tide of young voices by setting youth-inclusive research agendas in sustainability research”. *Sustainable Earth*, 4, 2. <https://doi.org/10.1186/s42055-021-00041-w>
- Berkson, J. (1938). Some difficulties of interpretation of interpolation encountered in the application of the chi-square test. *Journal of the American Statistical Association*, 33, 526-536, <https://doi.org/10.1080/01621459.1938.10502329>
- Biswas, T., & Mattheis, N. (2022). Strikingly educational: A childist perspective on children’s civil disobedience for climate justice, *Educational Philosophy and Theory*, 54(2), 145-157, <https://doi.org/10.1080/00131857.2021.1880390>
- Bowers, C.A. (1995). *Educating for an Ecologically Sustainable Culture: Rethinking Moral Education, Creativity, Intelligence, and Other Modern Orthodoxies*. State University of New York.
- Boyes, E., & Stanisstreet, M. (2012). Environmental education for behaviour change: Which actions should be targeted? *International Journal of Science Education*, 34, 1591-1614. <https://doi.org/10.1080/09500693.2011.584079>
- Brügger, A., Gubler, M., Steentjes, K., & Capstick, S.B. (2020). Social Identity and Risk Perception Explain Participation in the Swiss Youth Climate Strikes. *Sustainability*, 12(24), 10605. <https://doi.org/10.3390/su122410605>
- Buettner, A. (2020). ‘Imagine what we could do’— the school strikes for climate and reclaiming citizen empowerment, *Continuum*, 34(6), 828-839, <https://doi.org/10.1080/10304312.2020.1842123>
- Chang, H. (2022). Climate strike or not? Intersectionality of age and culture encountered by young climate activists in Taiwan. *Childhood*, in press. <http://doi.org/10.1177/09075682221074869>
- Chuang, Y., Xie, X., & Liu, C. (2016). Interdependent orientations increase pro-environmental preferences when facing self-interest conflicts: The mediating role of self-control. *Journal of Environmental Psychology*, 46, 96-105. <https://doi.org/10.1016/j.jenvp.2016.04.001>
- Cologna, V., Hoogendoorn, G., & Brick, C. (2021). To strike or not to strike? an investigation of the determinants of strike participation at the Fridays for Future climate strikes in Switzerland. *Plos One*, 16(10), e0257296. <https://doi.org/10.1371/journal.pone.0257296>
- Connell, R., Fischer, D., Fischman, G., Hopkins, C.A., Kohl, K., Komatsu, H., Metcalfe, M., Orr, D., Rappleye, J., Silova, I., Taylor, A., & Wulff, A. (2019). *Taking Action on Climate Crisis: An Urgent Call to Educators*. <https://educators-for-climate-action.org/about-us-2/>
- Deisenrieder, V., Kubisch, S., Keller, L., & Stötter, J. (2020). Bridging the Action Gap by Democratizing Climate Change Education—The Case of k.i.d.Z.21 in the Context of Fridays for Future. *Sustainability*,

12(5), 1748. <https://doi.org/10.3390/su12051748>

- Moor, J. de, Uba, K., Wahlstrom, M., Wennerhag, M., Vydt, M. D., Almeida, P., Gardner, B. G., Kocyba, P., Neuber, M., Gubernat, R., Koczyńska, M., Rammelt, H. P., & Davies, S. (2020). Introduction: Fridays For Future—An expanding climate movement. In J. de Moor, K. Uba, M. Wahlström, M. Wennerhag, & M. D. Vydt (Eds.), *Protest for a future II: Composition, mobilization and motives of the participants in Fridays For Future climate protests on 20–27 September, 2019, in 19 cities around the world* (pp. 6–33). Swedish Research Council for Sustainable Development. <https://paulalmeida.thescholar.com/publications/introduction-fridays-future-expanding-climate-movement>
- Diaconis, P., & Efron, B. (1983). Computer-intensive methods in statistics. *Scientific American*, 248, 116–131. <https://doi.org/10.1038/SCIENTIFICAMERICAN0583-116>
- Duff, H., Vignoles, V. L., Becker, M., & Milfont, T. L. (2022). Self-construals and environmental values in 55 cultures. *Journal of Environmental Psychology*, 79, 101722. <https://doi.org/10.1016/j.jenvp.2021.101722>
- Economist Intelligence Unit. (2020). Democracy Index 2019. [https://www.eiu.com/public/topical\\_report.aspx?campaignid=democracyindex2019](https://www.eiu.com/public/topical_report.aspx?campaignid=democracyindex2019)
- Edwards, B., & Gillham, P.F. (2013). Resource mobilization theory. Wiley Online Library <https://doi.org/10.1002/9780470674871.wbespm447>
- Ellis, P.D. (2010). *The Essential Guide to Effect Sizes*. Cambridge University Press.
- Emilsson, K., Johansson, H., & Wennerhag, M. (2020). Frame disputes or frame consensus? “Environment” or “welfare” first amongst climate strike protesters. *Sustainability*, 12(3), 882. <https://doi.org/10.3390/su12030882>
- Fisher, D.R. (2019). The broader importance of #FridaysForFuture. *Nature Climate Change*, 9(6), 430–431. <https://doi.org/10.1038/s41558-019-0484-y>
- Fisher, D.R., & Nasrin, S. (2021). Climate activism and its effects. *WIREs Climate Change*, 12(1), e683. <https://doi.org/10.1002/wcc.683>
- Fox, J. (2008). *Applied regression analysis and generalized linear models*. Sage.
- Freedom House. (2022). Global Freedom Scores. <https://freedomhouse.org/countries/freedom-world/scores?sort=desc&order=Total%20Score%20and%20Status>
- Fridays For Future. (2022). <https://fridaysforfuture.org/what-we-do/strike-statistics/list-of-countries/>
- Giattino, C., Ortiz-Ospina, E., & Roser, M. (2020). Working Hours. *OurWorldInData* <https://ourworldindata.org/working-hours>
- Glass, G.V., McGaw, B., & Smith, M.L. (1981). *Meta-Analysis in Social Research*. Sage.

- Gorman, J. (2021). Disobedient youth: Lessons from the youth climate strike movement. Maynooth University. <https://mural.maynoothuniversity.ie/14518/>
- Haerpfer, C., Inglehart, R., Moreno, A., Welzel, C., Kizilova, K., Diez-Medrano J., M. Lagos, P. Norris, E. Ponarin & B. Puranen et al. (2020). World Values Survey: Round Seven – Country-Pooled Datafile. Madrid, Spain & Vienna, Austria: JD Systems Institute & WVSA Secretariat. <https://doi.org/10.14281/18241.13>
- Haugestad, C.A.P., Skaug, A.D., Kunst, J.R., & Power, S.A. (2021). Why do youth participate in climate activism? A mixed-methods investigation of the #FridaysForFuture climate protests. *Journal of Environmental Psychology*, 76, 101647. <https://doi.org/10.1016/j.jenvp.2021.101647>
- Heath, J. (2020). Methodological individualism. *The Stanford Encyclopedia of Philosophy* (Summer 2020 Edition). <https://plato.stanford.edu/archives/sum2020/entries/methodological-individualism/>
- Hickel, J. (2020). Quantifying national responsibility for climate breakdown: An equality-based attribution approach for carbon dioxide emissions in excess of the planetary boundary. *The Lancet Planetary Health*, 4(9), e399–e404. [https://doi.org/10.1016/S2542-5196\(20\)30196-0](https://doi.org/10.1016/S2542-5196(20)30196-0)
- Hofstede, G., Hofstede, G.J., & Minkov, M. (2010). *Cultures and Organizations: Software of the Mind* (3rd Edition). McGraw Hill.
- Hofstede Insights (2022) Compare Countries. <https://www.hofstede-insights.com/product/compare-countries/>
- Hsueh, C.M. (2018) Higher Education Crisis in Taiwan. *The World View*. <https://www.insidehighered.com/blogs/world-view/higher-education-crisis-taiwan>
- Japanese Trade Union Confederation. (2021). Survey on Attitudes towards Diverse Social Movements and Labor Unions 2021. Japanese Trade Union Confederation. <https://www.jtuc-rengo.or.jp/info/chousa/>
- Jenkins, J.C. (1983). Resource mobilization theory and the study of social movements. *Annual Review of Sociology*, 9(1), 527–553. <https://doi.org/10.1146/annurev.so.09.080183.002523>
- Jobin, P., Ho, M., & Hsiao, H.M. (2021). *Environmental Movements and Politics of the Asian Anthropocene*. ASEAS Publishing.
- Kiffin-Petersen, S., & Cordery, J. (2003). Trust, individualism and job characteristics as predictors of employee preference for teamwork. *The International Journal of Human Resource Management*, 14(1), 93-116. <https://doi.org/10.1080/09585190210158538>
- Klandermans, B. (1984). Mobilization and participation: Social-psychological expansions of Resource Mobilization Theory. *American Sociological Review*, 49(5), 583. <https://doi.org/10.2307/2095417>



- Komatsu, H., & Rappleye, J. (2017a). A PISA paradox? An alternative theory of learning as a possible solution for variations in PISA scores. *Comparative Education Review*, 61(2), 269–297. <https://doi.org/10.1086/690809>
- Komatsu, H., & Rappleye, J. (2017b). A new global policy regime founded on invalid statistics? Hanushek, Woessmann, PISA, and economic growth. *Comparative Education*, 53(2), 166–191. <https://doi.org/10.1080/03050068.2017.1300008>
- Komatsu, H., & Rappleye, J. (2018). Is Exam Hell the cause of high academic achievement in East Asia? The Case of Japan and the case for transcending stereotypes. *British Education Research Journal* 44(5), 802–826. <https://doi.org/10.1002/berj.3468>
- Komatsu, H., Rappleye, J., & Silova, I. (2019). Culture and the independent self: Obstacles to environmental sustainability? *Anthropocene*, 26, 100198. <https://doi.org/10.1016/j.ancene.2019.100198>
- Komatsu, H., Rappleye, J., & Silova, I. (2020). Will achieving SDG4 promote environmental sustainability? Critical reflections looking towards 2030. In A. Wulff (Ed.) *Grading Goal Four: Tensions, Threats and Opportunities in the Sustainable Development Goal on Quality Education*. Brill-Sense. [https://doi.org/10.1163/9789004430365\\_014](https://doi.org/10.1163/9789004430365_014)
- Komatsu, H., Rappleye, J., & Silova, I. (2021). Student-centered learning and sustainability: Solution or problem? *Comparative Education Review*, 65(1), 6–33. <https://doi.org/10.1086/711829>
- Komatsu, H., Rappleye, J., & Silova, I. (2022a). Social mindfulness for global environmental sustainability? *Proceedings of the National Academy of Sciences of the United States of America*, 119(4), e2118710118. <https://doi.org/10.1073/pnas.2118710118>
- Komatsu, H., Fu, S., Lin, M., Hsieh, Y., Rappleye, J., & Silova, I. (2022b). Measuring the transformation of university students' self-construal for greater environmental sustainability. *Sage Open*, 12(1), 1–12. <https://doi.org/10.1177/21582440221079836>
- List, C., & Spiekermann, K. (2013). Methodological individualism and holism in political science: A reconciliation. *American Political Science Review*, 107, 629–642. <https://doi.org/10.1017/S0003055413000373>
- Laux, T. (2021). What makes a global movement? Analyzing the conditions for strong participation in the climate strike. *Social Science Information*, 60(3), 413–435. <https://doi.org/10.1177/05390184211022251>
- Markus, H.R., & Conner, A. (2014). *Clash: How to thrive in a multicultural world*. Plume.
- Markus, H.R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98(2), 224–253. <http://dx.doi.org/10.1037/0033-295X.98.2.224>

- Markus, H. R., & Kitayama, S. (2010). Cultures and selves: A cycle of mutual constitution. *Perspectives on Psychological Science* 5 (4): 420–430. <http://dx.doi.org/10.1177/1745691610375557>
- Marquardt, J. (2020). Fridays for Future's disruptive potential: An inconvenient youth between moderate and radical ideas. *Frontiers in Communication*, 5, 48. <https://doi.org/10.3389/fcomm.2020.00048>
- Marris, E. (2019). Why the world is watching young climate activists. *Nature*, 573, 471–472. <https://doi.org/10.1038/d41586-019-02696-0>
- Martiskainen, M., Axon, S., Sovacool, B. K., Sareen, S., Furszyfer Del Rio, D., & Axon, K. (2020). Contextualizing climate justice activism: Knowledge, emotions, motivations, and actions among climate strikers in six cities. *Global Environmental Change*, 65, 102180. <https://doi.org/10.1016/j.gloenvcha.2020.102180>
- McCloskey, S. (2019). What INGOs can learn from Greta Thunberg and the global climate strikes. *Open Democracy*. <https://www.opendemocracy.net/en/transformation/what-ingos-can-learn-greta-thunberg-and-global-climate-strikes/>
- Sakari Mesimäki. (2019). Where are Japan's climate strikers? *Tokyo Review*. <https://www.tokyoreview.net/2019/12/japan-climate-strike/>
- Metag, J., Füchslin, T., & Schäfer, M.S. (2017). Global warming's five Germanys: A typology of Germans' views on climate change and patterns of media use and information. *Public Understanding of Science*, 26, 434–451. <https://doi.org/10.1177/0963662515592558>
- Neuber, M., Daniel, A., & Gardner, B. G. (2021). Protesting for the future in pandemic contexts. Comparing participants in Fridays For Future global climate strikes in Austria and Germany. *Open Science Framework*. <https://doi.org/10.31219/osf.io/sb325>
- Neves, F.C. (2021). Climate Strikes: how effective is it to participate in them? *Leaders for Climate Action*. <https://lfca.earth/strikes/>
- Nisbett, R.E. (2003). *The geography of thought: How Asians and Westerners think differently. . . and why?* Free Press.
- OECD, (2009). *Green at Fifteen? How 15-year-olds Perform in Environmental Science and Geoscience in PISA 2006*. OECD Publishing. <https://doi.org/10.1787/9789264063600-en>
- OECD Stats. (2022). *OECD Stats*. <https://stats.oecd.org/>
- O'Neill, D. W., Fanning, A. L., Lamb, W. F., & Steinberger, J. K. (2018). A good life for all within planetary boundaries. *Nature Sustainability*, 1(2), 88–95. <https://doi.org/10.1038/s41893-018-0021-4>

- Pelham, B.R. (2009). Awareness, Opinions About Global Warming Vary Worldwide. Gallup. <http://news.gallup.com/poll/117772/Awareness-Opinions-Global-Warming-Vary-Worldwide.aspx>
- Pew Research Center. (2015). Global Concern about Climate Change, Broad Support for Limiting Emissions. <https://www.pewresearch.org/global/2015/11/05/global-concern-about-climate-change-broad-support-for-limiting-emissions/>
- Piff, P. K., Kraus, M. W., Cheng, B. H., & Keltner, D. (2010). Having Less, Giving More: The Influence of Social Class on Prosocial Behavior. *Journal of Personality and Social Psychology*, 99(5), 771–784. <https://doi.org/10.1037/a0020092>
- Plumwood, V. (1993). *Feminism and the Mastery of Nature*. Routledge.
- Prendergast, K., Hayward, B., Aoyagi, M., Burningham, K., Hasan, M. M., Jackson, T., Jha, V., Kuroki, L., Loukianov, A., Mattar, H., Schudel, I., Venn, S., & Yoshida, A. (2021). Youth attitudes and participation in climate protest: An international cities comparison. *Frontiers in Political Science*, 3, 696105. <https://doi.org/10.3389/fpos.2021.696105>
- Pugliese, A., & Ray, J. (2009). Top-Emitting Countries Differ on Climate Change Threat. Gallup. <http://news.gallup.com/poll/124595/Top-Emitting-Countries-Differ-Climate-Change-Threat.aspx#2>
- Rappleye, J., & Komatsu, H. (2018) Stereotypes as Anglo-American exam ritual? Comparisons of students' exam anxiety in East Asia, America, Australia, and the United Kingdom. *Oxford Review of Education* 44(6), 730–754. <https://doi.org/10.1080/03054985.2018.1444598>
- Rappleye, J., & Komatsu, H. (2020a). Towards (comparative) educational research for a finite future. *Comparative Education*, 56(2), 190–217. <https://doi.org/10.1080/03050068.2020.1741197>
- Rappleye, J., & Komatsu, H. (2020b). Is shadow education the driver of East Asia's high performance on comparative learning assessments? *Education Policy Analysis Archives*, 28(67), 1–25. <https://doi.org/10.14507/epaa.28.4990>
- Rappleye, J., Komatsu, H., & Silova, I. (2021). The Best Vaccine: Nature, Culture, and Covid-19. In W. Brehm, E. Unterhalter, & M. Oketch (Eds.) *States of Emergency: Education in the Time of COVID-19*. NORRAG Special Issue (pp. 120–124). <https://resources.norrag.org/resource/659/states-of-emergency-education-in-the-time-of-covid-19>
- Resource. (2017) Recycling: Who really leads the world? <https://resource.co/article/recycling-who-really-leads-world-11739>
- Rubin, M. (2012). Social class difference in social integration among students in higher education: A meta-analysis and recommendations for future research. *Journal of Diversity in Higher Education*, 5, 22–38. <https://doi.org/10.1037/a0026162>

- Sachs, J.D. (2021). Reasons for Asia-Pacific success in suppressing COVID-19. In J. Helliwell, R. Layard, J.D. Sachs, J. De Neve, L. Aknin, S. Wang, & S. Paculor (Eds.) *World Happiness Report 2021* (pp. 91–106). Sustainable Development Solutions Network. <https://worldhappiness.report/ed/2021/>
- Schumacher, E.F. (1973). *Small is Beautiful: A Study of Economics as if People Mattered*. Blond & Briggs.
- Schiermeier, Q., Atkinson, K., Mega, E.R., Padma, TV., Stoye, E., Tollefson, J., & Alexandra, W. (2019). Scientists join climate strikes. *Nature*, 573(26), 472–473. <https://doi.org/10.1038/d41586-019-02791-2>
- Silova, I., Rappleye, J., & Komatsu, H. (2019). Measuring what really matters: Education and large-scale assessments in the time of climate crisis. *ECNU Review of Education*, 2(3), 342–346. <https://doi.org/10.1177/2096531119878897>
- Silova, I., Komatsu, H., & Rappleye, J. (2021). Covid-19, climate, and culture: Facing the crisis of (neo)liberal individualism. *NORRAG*. <https://www.norrag.org/covid-19-climate-and-culture-facing-the-crisis-of-neoliberal-individualism-by-iveta-silova-hikaru-komatsu-and-jeremy-rappleye/>
- Sisco, M.R., Pianta, S., Weber, E.U., & Bosetti, V. (2021). Global climate marches sharply raise attention to climate change: Analysis of climate search behavior in 46 countries, *Journal of Environmental Psychology*, 75, 101596. <https://doi.org/10.1016/j.jenvp.2021.101596>
- Stephens, N.M., Brannon, T.N., Markus, H.R., & Nelson, J.E. (2015). Feeling at home in college: Fortifying school-relevant selves to reduce social class disparities in higher education. *Social Issues and Policy Review*, 9(1), 1–24. <https://doi.org/10.1111/sipr.12008>
- Taras, V., Steel, P., & Kirkman, B.L. (2012). Improving national cultural indices using a longitudinal meta-analysis of Hofstede's Dimensions. *Journal of World Business*, 47, 329–341. <https://doi.org/10.1016/j.jwb.2011.05.001>
- Taylor, M., & Syal, R. (2019). TUC and Amnesty come out in support of student climate strikes. *The Guardian*, <https://www.theguardian.com/environment/2019/sep/10/tuc-urges-members-support-student-climate-strikes>
- Taylor, M., Watts, J., & Bartlett, J. (2019). Climate crisis: 6 million people join latest wave of global protests. *The Guardian*. <https://www.theguardian.com/environment/2019/sep/27/climate-crisis-6-million-people-join-latest-wave-of-worldwide-protests>
- Thompson, B. (2002). What future quantitative social science research could look like: confidence intervals for effect sizes. *Educational Researcher*, 31, 25–32. <https://doi.org/10.3102/0013189X031003025>
- Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *Journal of Personality and*

- Social Psychology, 54(2), 323–338. <https://doi.org/10.1037/0022-3514.54.2.323>
- UNDP. (2021). People's Climate Vote. <https://www.undp.org/publications/peoples-climate-vote>
  - UNFCCC (2022). <https://unfccc.int/>
  - V-Dem Institute (2019). V-Dem Annual Democracy Report 2019. V-Dem Institute. [http://v-dem.net/democracy\\_reports.html](http://v-dem.net/democracy_reports.html)
  - Waniak-Michalak, H., & Perica, I. (2021). Does Social Trust Influence Charitable Giving for NGOs? Comparative Economic Research, 24(2), 175–191. <https://doi.org/10.18778/1508-2008.24.18>
  - Xie, B., Brewer, M.B., Hayes, B.K., McDonald, R.I., & Newell, B.R. (2019). Predicting climate change risk perception and willingness to act, Journal of Environmental Psychology, 65, 101331. <https://doi.org/10.1016/j.jenvp.2019.101331>
  - Yamagishi, T., Jin, N., & Miller, A. S. (1998). In-group Bias and Culture of Collectivism. Asian Journal of Social Psychology, 1(3), 315–328. <https://doi.org/10.1111/1467-839X.00020>
  - Yamagishi, T., & Yamagishi, M. (1994). Trust and commitment in the United States and Japan. Motivation and Emotion, 18(2), 129–166. <https://doi.org/10.1007/BF02249397>
  - Yang, L.-Q., Spector, P. E., Sanchez, J. I., Allen, T. D., Poelmans, S., Cooper, C. L., Lapierre, L. M., O'Driscoll, M. P., Abarca, N., Alexandrova, M., Antoniou, A.-S., Beham, B., Brough, P., Çarıkçı, I., Ferreira, P., Fraile, G., Geurts, S., Kinnunen, U., Lu, C., ... Woo, J.-M. (2012). Individualism–collectivism as a moderator of the work demands–strains relationship: A cross-level and cross-national examination. Journal of International Business Studies, 43(4), 424–443. <https://doi.org/10.1057/jibs.2011.58>
  - Zuckerman, A. (2020). 60 recycling statistics: 2020/2021 data, trends & predictions. CompareCamp, <https://comparecamp.com/recycling-statistics/>

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