The COVID-19 Pandemic Revives Traditional Values in Japan

Plamen Akaliyski^{1,2}, Naoko Taniguchi¹, Joonha Park³, Stefan Gehrig⁴ and Raül Tormos⁵

¹ Graduate School of System Design and Management, Keio University, Yokohama, Japan

² Department of Social Sciences, University Carlos III of Madrid, Madrid, Spain

³ Graduate School of Management, NUCB Business School, Nagoya, Japan

⁴ Independent researcher, Berlin, Germany

⁵ Centre d'Estudis d'Opinió - Generalitat de Catalunya, Catalonia, Spain

Address for correspondence: Plamen Akaliyski, Department of Social Sciences, University Carlos III of Madrid, Calle Madrid, 126. 28903 Madrid, Spain. Email: akaliyski.plamen@gmail.com

The COVID-19 Pandemic Revives Traditional Values in Japan

Abstract

The COVID-19 pandemic has had a profound impact on societies, with possible consequences for their fundamental values. Modernization theory links societal values to the underlying subjective sense of existential security in a given society (scarcity hypothesis), while also claiming that values remain stable once individuals reach adulthood (socialization hypothesis). An acute existential crisis such as the COVID-19 pandemic offers a rare opportunity to test these assumptions. We analyze data from representative surveys conducted shortly before and after the onset of the pandemic. Remaining survey sample differences are statistically controlled via propensity score weighting and regression adjustment, while post-stratification weights are used to allow conclusions about the Japanese population. In three sets of analyses, we reveal that the pandemic and the experienced psychological distress are negatively associated with emancipative and secular values, entailing a reversal to traditionalism, intolerance, and religiosity. First, we document a substantial decline in both emancipative and secular values in the first months of the pandemic compared to five months earlier and this decline remained stable a year later. Second, we present some evidence that value change was stronger in prefectures more severely affected by the pandemic. Third, individuals who experienced stronger psychological distress emphasized the same values more strongly, as evident in two surveys from May 2020 and April 2021. In contrast to the socialization hypothesis, our study provides evidence that, under extraordinary environmental conditions, values can change even within a negligibly short time period.

Keywords: values, culture, attitudes, Japan, COVID-19

1. Introduction

The COVID-19 pandemic is arguably the most acute existential crisis facing humanity on a global scale since World War II. As of August 2022, the coronavirus has infected 7.3% of the global population and caused 6.4 million deaths (Worldometer, 2022). Devastating is also the pandemic's economic impact, estimated as dozens of billions of USD (Cutler & Summers, 2020; Levy & Filippini, 2021). The emotional terror the pandemic has caused, the suffering under repeated lockdowns, the loss in human capital due to school closures and the inability to travel and maintain close social relationships are other consequences societies had to and continue to endure. Societal values—what we prioritize in life and desire as societal goals—are shaped by our natural and social environment (Schwartz, 2006). As security and standard of living have been rising globally (Pinker, 2018), so has societal culture changed to appreciate freedom, equality and diversity (Welzel, 2013). Therefore, we specifically set to examine if the pandemic, with all the adversity it has caused, may have reversed recent gains in cultural emancipation, focusing on Japan as a case study.

1.1 Emancipative and Secular Values

The particular set of values we examine are the so-called emancipative and secular values. Emancipative values denote emphasis on individual freedom and equality of opportunity, while secular values entail freedom from traditional sources of authority such as religion, nation, family and group norms (Welzel, 2013). The polar opposites to these values are labeled “patriarchal” and “sacred,” respectively. For convenience, we refer to both value polarities together as “traditional,” which can also empirically be justified by the observation that they generally covary across national cultures (Fig. 1a). The theory about change in these values is derived from the perception of human nature originating in Enlightenment philosophy, according to which *“Virtually everyone aspires to freedom and autonomy”*

(Inglehart, 2008:131). However, these aspirations are restricted by the necessity to satisfy more pressing needs such as physical security and survival (Inglehart, 2008; Maslow, 1954). As a society develops and a larger share of the population satisfies these basic needs, both emancipative and secular values increase (Welzel, 2013). This pattern of cultural change evidently occurs across the globe, including in non-Western societies, such as Japan (Welzel, 2012; Welzel & Dalton, 2017), which scores the highest on secular values and above average on emancipative values (Fig. 1a).

According to Inglehart's revised modernization theory and Welzel and Inglehart's human development theory (Inglehart, 2008; Welzel et al., 2003), these values reflect one's subjective sense of security, as well as "*the general sense of security prevailing in one's society*" (Inglehart, 2008:132), a proposition referred to as *scarcity hypothesis*. Therefore, these values could be affected, both at the individual and at societal level, by the experienced existential insecurity caused by the COVID-19 pandemic. According to Inglehart (2008), however, values do not adjust immediately to changing circumstances; they reflect the conditions in the pre-adult years and hardly change afterwards (*socialization hypothesis*). This perspective is supported also by the so-called *settled disposition model*, which examines cultural change through the lenses of intergenerational replacement and limited adaptation of individuals in their post-formative years (Kiley & Vaisey, 2020; Vaisey & Kiley, 2021). Tormos (2019) challenges this model by finding substantial value changes within the lifetime of individuals in Western societies, thus lending credibility to the alternative *active updating model*. Ambiguity remains regarding the extent to which acute short-term environmental threats could impact the values of adult populations.

Fig. 1. (a) Emancipative and secular values of countries during wave 7 (2017-2022) of the World Values Survey (WVS) with Japan's position highlighted. (b) Trend in emancipative and secular values in Japan 1995 (wave 3 of WVS) to 2019 (wave 7 of WVS).

Note. Computation of the values is described in more detail in section 2.2. Emancipative values include choice and equality subindices; secular values include defiance and disbelief subindices (see Fig. 2).

Thus, the literature largely agrees that values reflect the level of existential insecurity (*scarcity hypothesis*) but debates whether change occurs only between generations (*socialization hypothesis* and *settled disposition model*) or also within individuals' adult life (*active updating model*). Testing these theoretical models empirically is challenging, and rigorous assessments are elusive. Arguably, since the time mass surveys became available, developed societies have never experienced a comparably acute and truly global existential crisis as the COVID-19 pandemic. Therefore, the pandemic offers a unique opportunity to study value change under existential crisis. In this study, we focus on Japan, where, in line with the global trend (Welzel, 2013), emancipative and secular values have broadly increased over

the last decades (Fig. 1b), albeit with a notable deceleration or drop in the 2000's, a phenomenon that might be linked to the severe societal and economic consequences of Japan's Great Recession, often termed the "lost decades" (Taniguchi & Tochiwara, 2018).

By analyzing nationally representative data from three large surveys and investigating whether values remained unchanged by the pandemic, we assess the compatibility of these alternative views about the stability of cultural values with the empirical evidence from Japan. The first survey was conducted shortly before the pandemic, the two following surveys during the pandemic, with a longitudinal follow-up of the same respondents. The current study is guided by the following research question: *Has the existential insecurity associated with the COVID-19 pandemic caused a shift to more traditional values in Japan?*

The stated question is important for the social sciences as well as policymakers due to the substantive role of these values for political processes and societal well-being. Emancipative values specifically have been featured as the key cultural component underpinning democratic development, as they manifest societal support for individual freedoms and equality, spurring demand for universal and impartial democratic institutions (Welzel, 2013; Welzel, 2020). Secular values are related to emancipative values as they enable the liberation of individuals from sacred institutions and thus coevolve with emancipation in other domains (Alexander et al., 2016). Cultures that value freedom, equality and diversity allow more of their members to contribute to society and to realize their potential, thus enhancing psychological health, pro-social behavior, institutional quality, creativity and economic performance (Inglehart et al., 2008; Welzel, 2013). These values have been equated to an "assertive" civic political culture that has equivalent impact on democratic development across the globe, including East Asia (Dalton & Welzel, 2015).

1.2 The COVID-19 Pandemic in Japan

Although it arrived early, the pandemic in Japan remained relatively well-contained in terms of number of cases and mortality rate. At the time of the second survey used in the present analyses (mid-May 2020), there were only approximately 16,400 people tested positive and 744 deaths (Worldometer, 2022). Nevertheless, the economic and social costs have been high: GDP dropped by approximately 5% in 2020 (IMF, 2020), social life was suddenly and severely disrupted, and daily necessities such as masks and toilet paper were in short supply, similar to other countries more severely affected by the pandemic. School closures forced parents to take care of children at home, which put pressure excessively on working mothers. Crucially for the current study, the pandemic led to a high prevalence of psychological distress, associated with pandemic-related factors such as medical issues, difficulties in daily life, unavailability of groceries, and adjustment to new modes of work (Nagasu et al., 2021). Severe psychological distress increased by 2 percentage points to reach 11.5% of the Japanese population between the end of February, when Japan registered the first cases of infections, and the beginning of April, when it experienced the first serious wave of infections, enforced an entry ban and was in preparation to declare a state of emergency in several prefectures (Kikuchi et al., 2020). In September 2020, the prevalence of severe psychological distress was 10% at the national level and was associated with a mix of pandemic-related and socio-demographic factors such as fear of COVID-19, younger age, lower income, providing caregiving to family members and experience of domestic violence (Yoshioka et al., 2021). It is noteworthy that not all parts of the country were affected with the same severity. At the time of our first survey during the pandemic, several prefectures (47 large administrative units) were in a state of emergency due to significantly higher infection rates (see Appendix D) and risk of overburdening the medical facilities. These were large urban areas such as Greater Tokyo (Kanto region), Greater Osaka (Kansai region), as well as Hokkaido, which hosts one of the largest cities in the country, Sapporo.

1.3 Previous Research and Gaps in the Literature

Findings from recent empirical studies on the pandemic's impact on values are mixed, which may reflect either or both methodological challenges to study the problem and between-country differences. Two panel studies examine values and attitudes most similar to the ones we study. A study from 24 countries, including Japan, by Lampert et al. (2021) finds that the pandemic has brought a change towards stronger emphasis on freedom, emancipation, post-materialism and lower support for patriarchy and law and order, which contradicts both Inglehart's hypotheses. A Dutch panel study using European Values Survey data, which contains many survey items identical to those we examine, also finds that some values such as gender equality, immigration permissiveness, and social trust continue to increase during the pandemic (Reeskens et al., 2021). Values that they considered stable—so called 'easy' issues—such as religiosity and national pride, however, did not change, while traditional moral permissiveness, post-materialism, and support for strong leaders decreased.

Most other studies either document a conservative change in values during the onset of the pandemic or an individual-level relationship between psychological distress (e.g., fear of COVID-19, existential insecurity) and conservative values. One study among 107 countries shows a steep increase in interest in religion throughout the globe (Bentzen, 2021). In the US, studies document a reversal to traditional gender roles and stereotypes (Rosenfeld & Tomiyama, 2021), including gendered parenting roles (Mize et al., 2021), and an association between pathogen threat and conservatism among Democrats (but not Republicans) (Samore et al., 2021), as well as conservative ideological self-placement and partisan preference (O'Shea et al., 2021) and right-wing authoritarian traits (Pazhoohi & Kingstone, 2021). A study from US, Germany, and Singapore finds that the pandemic fostered traditional gender norms (Reichelt et al., 2020). Another study shows that experimentally activating Polish and American participants' thoughts about COVID-19 pandemic resulted in stronger social

conservative values and support for conservative presidential candidates (Karwowski et al., 2020). We are aware of only one study from the US which finds no change, specifically on moral foundations comprising items related to harm, fairness, authority, ingroup loyalty, and purity (Vartanova et al., 2021).

Surveys from Poland reveal an increase in authoritarianism, a desire for national cohesion, rejection of sexual dissenters (de Zavala et al., 2021) and religiosity (Boguszewski et al., 2020). In Italy, Molteni et al. (2020) find a revival of religiosity in terms of prayer and attendance of religious services (via internet, radio or TV) among individuals whose family members were infected.

Individual values also reversed to stronger conservation (emphasizing order and stability), as well as weaker openness to change (self-direction and stimulation), according to a longitudinal study from Australia (Daniel et al., 2021) and a study from France that asked respondents for their values retrospectively before the pandemic (Bonetto et al., 2021). In both countries, these value changes were associated with worrying about the pandemic and perceived threat, respectively.

Evidence from East Asia remains scarce. A small study of Chinese students from the first affected city, Wuhan, reports an increase in altruism, cooperation and aversion to risk and a decrease in trust during the first several weeks of lockdown (Shachat et al., 2021). Another study shows an increase in collectivist expressions such as personal pronouns on a Chinese online social network following the onset of the pandemic (Han et al., 2021). A third study, from South Korea, reports a change towards stronger collectivism, but somewhat paradoxically not weaker individualism (Na et al., 2021).

Our literature review reveals several remaining gaps, which we intent to fill. First, most surveys were not longitudinal and did not attempt to solve the problem of comparability between the samples from before and during the pandemic, which casts concerns that the

differences might be due to sampling bias, instead of actual change. In addition, most studies use convenience samples of, for example, students or self-selected volunteers, thus revealing little about the processes in the larger population. Survey-wise, none of them tracks the longer term dynamic of value change from the onset of the pandemic to its unfolding in 2021. Daniel et al. (2021) show that in their last survey in November-December 2020, previously documented value changes have begun to reverse, thus indicating that other studies may document only short-lived changes in volatile attitudes, instead of deeper and lasting changes in societal values.

Moreover, almost all evidence comes from samples that are typically overrepresented in the literature, viz. WEIRD (Western, educated, industrialized, rich and democratic) (Henrich et al., 2010). Numerous research indicates different psychological processes taking place in East Asia and the West (Markus & Kitayama, 1991; Nisbett, 2004). The pandemic's effects in the Japanese unique cultural environment to date remain unknown and therefore our goal is to fill this gap.

1.4 Hypotheses

Based on the theoretical considerations reviewed in the introduction, and regardless of the mixed empirical evidence, we expect that as a result of the pandemic values have shifted towards a *lower* emphasis on freedom, equality, and secularity. Moreover, we expect that the stronger the psychological distress caused by the pandemic, the more values will reverse to traditionalism, meaning weaker support for individual and sexual liberties and gender equality, and stronger religiosity, nationalism, and family values. Based on this proposition, we formulate three more specific hypotheses. Since the pandemic is global in nature and virtually the whole population of Japan has been aware of the threat it entails, regardless if they were more or less personally affected, we expect that:

Hypothesis 1. The Japanese population has become more traditional in its values due to the onset of the pandemic.

As noted earlier, some Japanese regions were more seriously affected than others. Particularly, at the time of our first survey during the pandemic, a state of emergency was announced in eight prefectures where the situation was most critical and the number of infections varied widely between prefectures (Appendix D). Therefore, we expect that:

Hypothesis 2. Prefectures more severely affected by the pandemic experienced stronger change towards traditional values.

Furthermore, we shift focus to individual-level variation. Regardless of the area of residence, individuals experienced the pandemic differently. Even if equally affected in terms of objective measures such as losing a job or having to work from home, not everyone necessarily perceived it subjectively in the same way, and we expect values to change as a reaction to personally perceived distress. Therefore, our third hypothesis is the following:

Hypothesis 3. Individuals who experienced more psychological distress during the pandemic changed their values more strongly than less affected individuals.

2. Data and Methods

2.1 Data

To test these hypotheses, we use datasets from three surveys: the World Values Survey (WVS) and the Values in Crisis (VIC) survey, the latter of which were conducted in two waves: at the beginning of the pandemic and a year later (Table 1). Fortunately, in terms of timing, the most recent wave (wave 7) of the WVS (henceforth, WVS7) was carried out in September 2019, which was only a few months before the onset of the pandemic and approximately eight months before the first VIC survey.

WVS7 surveyed 1,353 respondents over the age of 17, using mail-out data collection mode, and applying triple quotas based on census data from 2015 for gender, age and area (Yamazaki, 2019). The VIC survey is part of a larger collaboration including more than a dozen countries globally, planned to be surveyed in three waves between 2020 and 2022 (Welzel et al., 2020). The first wave of the Japanese VIC survey (VIC1) was conducted online on 15-16th May 2020 and included 3,000 respondents. The data represent the population of Japan as of census data from 2015, in three strata: gender, age, and city size. The second wave (VIC2) was collected almost a year later and aimed to reach as many respondents from the first wave as possible, thus was carried out for a longer time period than the first wave, namely between 5th and 19th April 2021. The retention rate was almost 60% ($N = 1,882$) and a refreshment sample of 1,118 was added to reach the same total number of respondents as VIC1 ($N = 3,000$).

Even though both WVS7 and VIC surveys aimed to be nationally representative with respect to demographic characteristics, there are certain deviations from the actual population as per the census data (Table 1). Older, more educated, and female respondents are slightly overrepresented in the WVS7 (Yamazaki, 2019), while the VIC survey could not reach respondents at the age of 70 or older (see also Appendix B).

Table 1*Description of surveys.*

	WVS7	VIC1	VIC2
Time of survey	September 2019	May 2020	April 2021
Number of respondents	1,353	3,000	3,000 (1,882 + 1,118)
Data collection mode	Mail-out	Online	Online
Quotas	gender, age and area	gender, age, and city size	gender, age, and city size
Main deviations from census data	Older, more educated and female respondents slightly overrepresented	Age < 70	Age < 70

2.2 Variables

Our variables of interest are emancipative and secular values and their comprising items. These values are constructed using a formative, instead of latent-variable approach (Welzel, 2013), meaning that they comprise conceptually related items that may not correlate strongly with each other. Hence, we refer to them as indices—Emancipative Values Index (EVI) and Secular Values Index (SVI), respectively (see Fig. 2 for their composition)—and we run all analyses also separately for their components, in order to capture dynamics in more specific attitudinal measures. Their original versions comprise four sub-indices each measured by three items from the WVS (Welzel, 2013). The VIC surveys include a short version of these values comprising only two sub-indices, albeit those with the highest loadings on the composite index (Welzel, 2013) and the two EVI components have demonstrated higher degree of cross-cultural equivalence (Sokolov, 2018). Item wording and response scales were identical with a few exceptions. Two VIC survey items, measuring EVI’s Equality sub-index, use different

scales than the corresponding items in the WVS7, and are therefore not used for comparisons between WVS7 and VIC surveys. Additionally, one item of SVI's Agnosticism sub-index is also not comparable, because it asks respondents to report their attendance of religious services *before the pandemic* instead of currently. This means we cannot use the item to estimate current religious values at the time of the VIC survey, but the item offers an important opportunity to adjust for potential sample differences with respect to pre-pandemic religiosity (see section 2.3). We measure EVI as the extent to which respondents support gender equality in education, labor market and politics (the last two not available for the WVS7-VIC comparisons), and accept homosexuality, abortion, and divorce. For SVI, we have five items: disagreeing that one of the important goals in life is to make parents proud, not being proud with nationality, not approving a greater respect for authority, not finding religion important in life and defining oneself as an atheist or agnostic (vs. a religious person). All items and indices were rescaled to vary between 0 and 100, analogously to the approach in Welzel (2013). EVI and SVI were always based on all items and were coded as missing if a single item was missing (note that estimated values shown in Fig. 1 are based on the identical set of items that is also used in the WVS7-VIC1 comparison (see Fig. 2) to allow comparisons of our results with differences between countries and survey waves).

Fig. 2. Composition of Emancipative and Secular Value indices.

Note. In rectangles are observed items; in circles are composite indices and sub-indices. In rectangles with dashed borders are items included only in the analyses using exclusively VIC1

and VIC2 data sets (i.e., these items are not used when computing the respective index for the WVS7-VIC1 comparison). The crossed over item was not used in any analysis as an outcome variable.

The VIC surveys measure psychological distress by a scale consisting of five items: (1) Feeling nervous, anxious or on edge; (2) Not being able to stop or control worrying; (3) Feeling down, depressed or hopeless; (4) Little interest or pleasure in doing things; and (5) Feeling lonely. A Cronbach's alpha of 0.92 indicates high internal scale consistency. The psychological distress variable had a range from 1 to 4, a mean of 1.67, median of 1.40 and standard deviation of 0.83 in the pooled sample of VIC1 and VIC2.

Those two surveys also included shortened measures of the Big Five personality traits (10 items) (Rammstedt & John, 2007). Besides values and psychological measures, we use a set of socio-demographic variables from all three surveys to adjust our analysis for potential differences in these characteristics, which we describe in section 2.3.

Only observations having information on the full set of adjustment variables and on at least one of the indices (EVI or SVI) were retained for analysis ($N = 1,138$ from WVS7, $N = 2,920$ from VIC1, $N = 2,827$ from VIC2).

2.3 Empirical Strategy

2.3.1 Hypotheses 1 & 2

The first two hypotheses were tested by comparing results from national surveys conducted before and during the pandemic. Importantly, causally attributing any observed differences in values between the surveys to the pandemic requires excluding other confounding factors. Most importantly, respondents of the WVS7 and VIC surveys might differ in some characteristics that also predict EVI and SVI, which requires to adjust for such differences.

Although both surveys incorporate demographic factors in their design and target nationally representative samples, there are differences in sample composition with respect to some demographic variables (see Appendix B), with the VIC1 sample being, for example, somewhat younger, childless, and more frequently single. Nevertheless, the range of observed characteristics overlaps to a large extent. Therefore, it is possible to employ inverse probability of treatment weighting (IPTW, explained in more detail in Appendix A) to statistically control for these differences (Austin & Stuart, 2015). A particular strength of the data is that VIC1 asked about the frequency of religious service attendance *prior to the pandemic*, a question also present in WVS7 (phrased to mean *current* attendance), such that, besides demographic and geographical factors, respondents could also be weighted with respect to a behavioral proxy for their “baseline” religiosity before the pandemic, making the samples more comparable in a dimension that is very likely linked to the outcomes of interest (most obviously to secular values).

To construct weights for IPTW, we estimated propensity scores for all respondents of WVS7 and VIC1 based on nine characteristics: age, number of children, household size (all continuous), gender, marital status, education, prefecture (there are 47 prefectures in Japan, nested within seven regions), town size and prior religious services attendance. These scores represent the probability of being surveyed in WVS7 rather than VIC1, given each respondent’s socio-demographic characteristics (see Appendix A for details) and were estimated via logistic regression (model shown in Appendix C). Propensity scores show a large region of common support between WVS7 and VIC1 (Fig. 3a) and weighting is strongly improving the balance between samples (Fig. 3b and Appendix B). To adjust for remaining sample differences, the same variables used for propensity score estimation were also included as predictors in the regression models which we used to infer the effect of the pandemic on values (with one exception: region instead of prefecture dummies are used in the outcome regressions due to the

large number of prefectures). The combination of IPTW with regression adjustment represents a “doubly-robust” approach to causal inference (e.g., Hernan & Robins, 2020)

Above methods aim at eliminating the influence of observed differences in sample compositions between the surveys on our effect estimates. To also improve the generalizability of findings from our samples for the Japanese (adult) population as a whole, we further used post-stratification weights, which we then multiplied with the propensity weights to simultaneously account for aspects of confounding and survey design (Dong et al., 2020; Ridgeway et al., 2015). In particular, we post-stratified by gender, age and prefecture based on recent Japanese census data from 2020 (for details, see Appendix A) and indeed achieved close alignment of sample frequencies and population frequencies (Appendix B).

For assessing Hypothesis 1, we estimated the contrast between values before and after the pandemic’s onset (WVS7 to VIC1) as coefficient of a dummy variable that was 1 if the observation belonged to the VIC1 survey and 0 if it belonged to WVS7 in weighted linear regressions with heteroscedasticity-robust standard errors (HC1 type) and all adjustment variables. To analyze longer-term impacts, we also ran linear regressions comparing WVS7 and VIC2. As robustness check, these were run once with the remaining longitudinal sample of respondents from VIC 1 (i.e., those that took part in both VIC1 and VIC2 and did not drop out), and once with the full sample from VIC2 (i.e., the remaining longitudinal sample + the refreshment sample).

Fig. 3: (a) Overlap of propensity scores between WVS7 and VIC1 surveys. (b) Absolute standardized mean difference in individuals' characteristics between the two surveys when using inverse probability of treatment weighting based on the estimated propensity scores in combination with post-stratification weights ('Weighted') vs. raw sample data ('Unweighted').

For assessing Hypothesis 2, we focus on the comparison of WVS7 with VIC1. The goal was to test whether the effect of the crisis on values was stronger in prefectures that were more severely affected by the pandemic at its initial onset. As an indicator of severity at the prefecture level, we used the number of cumulative COVID-19 infections per 100,000 up to the day of the VIC1 survey in May 2020 in the respondent's prefecture (Japan Broadcasting Corporation, 2021). Hence, this variable captures between-prefecture heterogeneity in the exposure to health risk, but also in exposure to psychological, economic and social impacts of

the pandemic. It strongly correlates with the cumulative incidence of COVID-19 deaths up to the VIC1 survey day ($r = 0.90$) and the declaration of a state of emergency in the prefecture ($r = 0.62$). Cumulative infections ranged between 0.0 and 36.1 (median: 5.9, mean: 7.8, standard deviation: 7.4; see Appendix D for geographical representation of the data).

To estimate the effect of crisis severity, weighted linear regressions were fit with an interaction term between cumulative infections in the prefecture and a dummy indicating whether the respondent was from the VIC1 (vs. WVS7) survey, as well as all adjustment variables. A negative coefficient for this interaction term would indicate that a decrease in certain values was larger in prefectures with higher cumulative incidence of infections. Since the predictor of interest in this analysis, the prefecture's exposure to COVID-19, is correlated among individuals within prefectures, standard errors were clustered at the prefecture level.

2.3.2 Hypothesis 3

The third set of analyses exploited individual differences in experience of psychological adversity during the crisis elicited in the VIC1 and VIC2 surveys and therefore excludes WVS7 respondents. Accordingly, propensity weights play no role in this analysis, but post-stratification weights still do. In weighted linear models, we tested whether variation in values was linked to variation in psychological distress, adjusting for the same nine variables as above, and in addition for the shortened measures of all Big Five personality traits, household income (which had not been elicited in WVS7 in similar detail and completeness) and VIC survey wave (1 or 2). All respondents from VIC1 were included in the analysis as well as the refreshment sample from VIC2.

We preferred to conduct the analysis between individuals instead of using the typically less-biased within-individual estimator (individual fixed-effects regression) for two reasons: 1) we identified that the 40% dropouts in our second survey were not random with regard to our

key explanatory variable, psychological distress (the dropouts having significantly higher distress in VIC1 than the retained sample, 1.75 vs. 1.65 points, $p = 0.003$, Welch's t-test, and the replacement sample having higher distress in VIC2 than the retained sample, 1.74 vs. 1.61 points, $p < 0.001$), which may introduce bias when excluding the dropouts from all analyses on psychological distress, as would have been necessary for within-individual analysis; 2) we expect that value change occurred mostly in the early stage of the pandemic, i.e., around VIC1 survey, when, due to the initial shock, there was a significant increase in psychological distress (Kikuchi et al., 2020). Subsequently, between the VIC1 and VIC2 surveys, the population likely became accustomed to the continuous threat. In contrast to many Western countries, the pandemic in Japan remained relatively well under control during the observed time frame, resulting in no further exacerbation of distress (Yoshioka et al., 2021). In line with these considerations, the bulk of variation in distress that we find is between individuals, not within individuals over time, as indicated by the high intra-individual correlation of distress, $r = 0.53$. This variation could not have been exploited in an analysis that discards all variation except within-individual changes. For completeness, results from fixed-effect regressions are presented and discussed in Appendix E.

All analyses were conducted in R 4.2.1 (R Core Team, 2021) with *estimatr* (Blair et al., 2022) for modelling and inference. Data and code are available for the reader to reproduce all findings at <https://anonymous.4open.science/r/japanvalues-D1DD>.

3. Results

3.1 National-level Change

Results in Fig. 4 indicate differences in values between shortly before (WVS7) and after the onset of the pandemic (VIC1). Emancipative and secular values have decreased significantly in the first few months of the pandemic. Most striking are the greater respect for

authority and importance of religion, as well as the substantially lower support for gender equality and acceptance of homosexuality. Two items changed in unexpected direction: acceptance of abortion and not being proud with the nation, both of which increased. Given the correction for sample differences via weighting and regression adjustment, and since the two surveys were only eight months apart, with the long-term trend before the pandemic being in the emancipative/secular direction, we conclude that the pandemic has overall negatively affected the values and attitudes of Japanese people, thus confirming Hypothesis 1.

Fig. 4. Box and density plots show the weighted distribution of (a) EVI and (c) SVI before (WVS7) vs. after the onset of the pandemic (VIC1). Forest plots show changes in (b) EVI and (d) SVI and all their component items as estimated in weighted linear regressions including adjustment variables.

Note. All variables are coded in such a way that negative values reflect a decrease in EVI and SVI. Estimates are shown with 95% confidence intervals (columns on the right). Models are adjusted for age, gender, number of children, household size, marital status, education, region, town size and prior religious services attendance.

Fig. 5 shows longer-term differences in values compared to before the pandemic. Almost a year after VIC1, the point estimates of both EVI and SVI have remained largely

unchanged between VIC1 and VIC2. Some increase is observed in not being proud with the nation and acceptance of abortion, which essentially continue the trends from the previous survey. Other moral permissiveness items, such as acceptance of homosexuality and divorce have also registered slight increases, implying a modest recovery back in the direction of pre-pandemic levels. Attitudes towards gender equality, importance of religion and disrespect for authority, which were most strongly affected by the pandemic according to our first survey, have apparently not yet begun to recover a year later. These results indicate a lasting impact of the pandemic on values, at least for some items.

Fig. 5. Changes in values between WVS7 and the two VIC surveys as estimated in weighted linear regressions including adjustment variables. *Note.* For VIC2, results are shown from an analysis based on the follow-up of respondents from VIC1 (continuous line) and based on the complete VIC2 sample (dashed line). All variables are coded in such a way that negative values reflect a decrease in EVI and SVI. Estimates are shown with 95% confidence intervals. Models

are adjusted for age, gender, number of children, household size, marital status, education, region, town size and prior religious services attendance.

3.2 Prefecture-level Variation in Change

Next, we present the effect of the severity of the pandemic on the change in values from before to during the pandemic (WVS7 to VIC1), with severity measured as the cumulative infection rate at the prefecture level (Fig. 6). The results broadly resemble those of the overall changes presented in the previous analysis, although there is higher uncertainty in the estimates and most confidence limits are not far from the zero line. As hypothesized, the pandemic's severity appears to accelerate the decrease in both EVI and, to a slightly lesser extent, SVI, and most strongly so for the item of disrespect of authority. Again, we see that national pride deteriorates in light of the pandemic, despite the tendency of other traditional values to become more pronounced. To ease interpretation of the interaction effects, we visualize model-based predictions in Appendix D.

Fig. 6. Effect of the number of cumulative infections in the prefecture (per 100,000) on the change in values from before to during the pandemic as estimated in weighted linear regressions including adjustment variables. *Note.* Negative estimates indicate that the decrease in values from WVS7 to VIC1 is stronger in prefectures with higher infection rate. Estimates are shown with 95% confidence intervals (columns on the right). Models are adjusted for age, gender, number of children, household size, marital status, education, region, town size and prior religious services attendance.

3.3 Individual-level Variation in Psychological Distress and Values

Next, we report the association between psychological distress and values among respondents from both surveys conducted during the pandemic (VIC1 and VIC2), conditional on a large number of socio-demographic variables and measures of personality. The effect of distress on items measuring EVI is rather uniform (Fig. 7): persons reporting more psychological distress tend to exhibit somewhat lower support for gender equality, however, with more marked effects on the items of the choice sub-index: acceptance of homosexuality, abortion, and divorce. With respect to SVI, a higher level of psychological distress is associated with higher importance of religion and more respect for authority, thus remarkably overlapping with the findings on the national- and prefecture-level change. Again, in accord with those findings, individuals who suffer from psychological distress are distinctly less proud with being Japanese. Likely due to the strong positive effect on not being proud with the nation, the overall effect on SVI is rather weak (if we exclude that item from the dependent variable, the overall effect of distress on SVI turns out to be strong, with a point estimate of -1.3 [95% CI: -2.1; -0.5] instead of -0.3 [95% CI: -1.1; 0.4])

Fig. 7. Association between psychological distress and (a) EVI and (b) SVI among respondents from the VIC1 and VIC2 surveys as estimated in weighted linear regressions including adjustment variables. *Note.* Estimates are shown with 95% confidence intervals (columns on the right). Models are adjusted for age, gender, number of children, household size, marital status, education, region, town size, prior religious services attendance, household income and brief measures of the Big Five personality dimensions.

3.4 Summary of Empirical Findings

To summarize, examining the variation at all levels of analysis – national, regional, and individual – we find that the experience of the pandemic is linked to a reversal to more traditional, intolerant, and religious values. In the national analysis (Hypothesis 1), comparing national pre- vs. post-pandemic values, effects are strong for the emancipative and secular indices as well as most of their components. This average national pattern largely re-emerges when quantifying the moderating role of pandemic severity in the prefecture of the respondent, albeit with more uncertain estimates (Hypothesis 2). The individual-level analysis (Hypothesis 3) delivers substantial evidence that levels of psychological distress are also correlated with

lower emancipative and secular values, conditional on an extensive set of potential confounders (i.e., variables that might be linked both to susceptibility to distress and personal values).

Notably, the pattern of change was not uniform across all the individual items. Among the most consistent and strong effects were the increase in religiosity and respect for authority suggesting that amid the pandemic individuals may seek security in traditional sources of authority such as religion and family, but the nation may not be one of them for Japanese people. According to all three analyses, the pandemic has brought a substantial decline in national pride. Signals are most mixed for the item on acceptance of abortion. Such acceptance appears to increase in the national average with the start of COVID-19 pandemic and remains high a year later, but when examining variation in pandemic exposure between prefectures and individuals, the effect goes in the opposite direction.

4. Discussion

Our study across different levels of analysis, utilizing three large surveys, suggests that the pandemic has caused a reversal towards more traditional societal values. This supports Inglehart's modernization theory (*scarcity hypothesis*) in linking existential insecurity to conservative values, as well as theories that more specifically focus on effects of pathogen prevalence on values (e.g., Fincher et al., 2008; Welzel, 2013). Our study takes advantage of the unprecedented occurrence of a global pandemic in modern times to document this mechanism of cultural change. This study contributes to our understanding of cultural differences between modern societies, which ostensibly reflect the accumulation of learnt patterns of thought and behavior that is adaptable to the prevalent environmental conditions in a given society throughout its history.

We demonstrate that such adaptation to changing environment can occur even for a much shorter period than previously supposed and on issues that were considered rather stable

such as religiosity and gender equality (Reeskens et al., 2021). Gradual cultural change that happens primarily between generations (Inglehart, 2008; Kiley & Vaisey, 2020) may only account for a part of the total change produced by socio-environmental changes, which is also driven by period effects (Tormos, 2019). Given a sudden and acute existential crisis, such as the COVID-19 pandemic, humans might adapt to threat by swiftly shifting their value priorities. Our study therefore enriches the debate between settled disposition and active updating models of stability and change in culture (Kiley & Vaisey, 2020). While Kiley and Vaisey (2020) find stronger support for the stability of attitudes within individuals, their evidence is drawn from a fairly stable society (the US) during the relatively stable pre-pandemic time period. We find ample evidence in favor of the alternative, active updating model, precisely because we tracked the change at a time of considerable environmental turmoil. In the presence of a glacial-speed environmental change, attitudinal adaptation might be equally difficult to detect in a short time period.

Our findings should not be surprising given the magnitude of the pandemic's impact that has brought concerns about our very existence on a mass societal scale. We find that the societal adaptation in terms of values in Japan is considerably large. Our models estimate a decline of about 7 and 6 points on a 100 points-scale for EVI and SVI, respectively, and especially on specific issues such as respect for authority (16 points), importance of religion (15 points), and acceptance of homosexuality (12 points; Fig. 4). Such changes, in either direction, typically take a decade or longer to occur. In fact, due to our empirical strategy which re-weights VIC observations in a way to make them comparable to the Japanese population surveyed in the WVS, we can reasonably compare our effect sizes with the longitudinal change that has been documented over the five most recent waves of the WVS (Fig. 1b). Such a comparison indicates that, a few weeks after the onset of the pandemic, emancipative values had been "set back" to the level of roughly a decade earlier, with no clear recovery in the

following year. Of course, this interpretation is only warranted under the assumption our methods largely eliminate alternative explanations (see section 5). In terms of the combined indices, it is worth noting that even when taking into account estimated value change brought upon by the pandemic, Japan remains fairly high in emancipative and especially in secular values relative to other countries (Fig. 1a; almost all countries in WVS7 had their fieldwork finished prior to the pandemic).

Other studies from Western countries on the pandemic's impact suggest a turn to conservatism but at a negligible rate and not uniformly across all investigations (e.g., Vartanova et al., 2021), and some indicate even change in the opposite direction in all (Lampert et al., 2021) or at least some specific attitudes considered more volatile (Reeskens et al., 2021).

We offer potential methodological and substantive explanations for these discrepancies. First, it is important to consider the timing of the investigation. Lampert et al.'s study surveyed respondents for the first time between end of January and March 2020 when the pandemic was already causing serious concerns across the globe – which underlies the very motivation of conducting their study. Thus, the first survey may already reflect the initial impact of the pandemic rather than a “baseline” measurement. Second, the authors report that at least 1,000 respondents were surveyed initially, while an average of 365 respondents completed the survey at the second time point (p. 45). There are no further details on how the authors addressed this issue, which casts a serious doubt that the differences between the two waves reflect actual changes on a populational level. In contrast, Reeskens et al.'s study achieves a retention rate of about 60% (comparable to ours) and also apply post-stratification weights to correct for the sociodemographic structure of the Dutch population. Their first wave of data, however, was collected at the end of 2017, thus their results likely reflect more than two years of pre-pandemic growth in these values (plausibly assuming that previous trends continued) and not simply the impact of the pandemic.

Furthermore, societies experience the pandemic with different intensity, not only in terms of prevalence of the disease, mortality, and economic impact, but also psychologically. East Asian populations top the global ranking in terms of being frightened of the COVID-19 pandemic, despite (or as a result) having substantially lower infection rates than countries from all other world regions, which exhibited more relaxed attitudes towards the risks of infection (Li et al., 2022). Thus, a culture's susceptibility to experience threat and uncertainty may act as its own catalyst of cultural change. In that case, our findings likely reflect not only the pandemic's impact, but also its interaction with Japanese culture's extreme aversion to uncertainty (Hofstede et al., 2005). Although the existential threat's impact on values may be universal across the globe, the magnitude may be amplified in Japan's (or East Asia's) unique cultural setting.

These findings align well with many others from Western societies that find a pandemic-related turn to traditional, conservative, and authoritarian attitudes that may undermine the cultural foundations of liberal democracy. National governments could target these negative effects by providing safety nets to citizens that can cushion the pandemic's psychological burden.

Noteworthy, along with the changes in the expected direction towards more traditional values, we also observed some effects on individual items that were in the opposite direction to that of the rest. Justifiability of abortion has increased on average, which in the highly secular Japanese context is more disassociated from religiosity, and may reflect an increased desire to control reproductive decisions in times of uncertainty (Aassve et al., 2020). National pride has decreased, in contrast to the marked and stable increase in respect for authority, and the slight and unstable increase in desire to make parents proud, which supposedly are conceptually related as part of SVI's defiance sub-index. The decreased national pride may be linked to people's negative evaluation of the performance of the government with dealing with the

pandemic (Jae Moon et al., 2021; Taniguchi et al., 2022), which may not necessarily reflect its actual performance in comparison to other nations. The increased respect for authority and diminished national pride thus may occur simultaneously because people demand strong authority during the periods of insecurity, such as a pandemic, while they may be unable to feel proud of their nation because the government has failed to meet their expectations. These two examples suggest that, at least in the short term, items that supposedly fall under the same conceptual umbrella may be affected differentially by specific environmental changes.

5. Limitations and Further Research

Interpreting the statistical results in a causal manner requires to assume that our adjustment strategies are sufficient to control for confounding and therefore to rule out alternative explanations. This includes, for example, the assumption that the WVS7 and VIC1 samples do not differ in important unobserved predictors of emancipative and secular values. Put differently, we assume that the characteristics we control for (see, e.g., Appendix B) are sufficient to eliminate confounding between survey participation (WVS vs. VIC) and emancipative/secular values. Panel surveys that follow the same individuals are in general preferred because observed changes cannot be due to changes in sample composition. However, panel surveys have their own issues, like typically high and non-random dropout. Thus, while panel studies enable making stronger claims about causal effects occurring within individuals, generalizations regarding population-level effects require great caution. In contrast, our study used data sets from surveys that targeted representative samples of the entire Japanese population and used IPTW in combination with regression adjustment to control for remaining sample differences. Still, we cannot completely rule out remaining biases, especially response bias in online (VIC) as compared to mail surveys (WVS7), that may distort our comparisons. Nevertheless, previous studies show that paper-and-pencil and online modes of

data collection provide comparable results when measuring social values (Lilleoja et al., 2016). Moreover, our findings are strikingly consistent across models at three levels of variation and go against the previous temporal trend in Japan (Fig. 1b). It is worth noting that the VIC sample is slightly younger, has fewer children, more likely to be unmarried and behaved less religious before the pandemic (as indicated by religious service attendance prior to the pandemic) than the WVS7 sample (Appendix B). These characteristics, for which we adjust, indicate that, if anything, the VIC sample is biased in the direction of a more liberal and less traditionally minded subset of the Japanese population. Indeed, age is negatively correlated with EVI ($r = -0.33$) and SVI ($r = -0.28$) among the Japanese WVS7 respondents. Therefore, we expect remaining biases due to sample differences to work *against* rather than in favor of our hypotheses.

Besides sample composition and survey mode, confounding due to other events that occurred between WVS7 and VIC1 could also be a concern. However, it is reasonable to assume that, given the exceptional impact of the COVID-19 pandemic on all domains of life, the typically slow pace of “natural” value change in upward direction (Fig. 1b), and the small time window between the two surveys (eight months), no other events occurred in Japan that could have affected national values in a similarly impactful way. This is especially the case for the combined indices, in contrast to individual items, which could more easily be affected, for example, by a recent and salient media discourse on a particular topic.

We are curious to know how durable these value changes are. For example, the global run on religion in the first months of the pandemic documented by Bentzen (2021) leveled off relative quickly, but her measure of religiosity remained above pre-pandemic levels until at least December 2020. For Japan, the VIC2 survey was conducted 11 months after VIC1 and indicates that the initial decline in emancipative and secular values remains mostly stable, but we are unable to predict whether the previous trend might be permanently altered or values will

return to their baseline level when the effects of the pandemic dissipate. It is also uncertain if more significantly affected individuals would remain traumatized and take longer to recover than the general population. Therefore, even if the overall trend in values in the Japanese society reaches and surpasses the pre-pandemic levels, this may be due to the changes experienced by the majority of the population, despite individuals who experienced stronger psychological distress continuing to hold more traditional values. The upcoming WVS wave 8, estimated around 2024, would allow to provide evidence-based answers to these questions.

6. References

- Aassve, A., Cavalli, N., Mencarini, L., Plach, S., & Bacci, M. L. (2020). The COVID-19 pandemic and human fertility. *Science*, 369(6502), 370–371.
<https://doi.org/10.1126/science.abc9520>
- Alexander, A. C., Inglehart, R., & Welzel, C. (2016). Emancipating Sexuality: Breakthroughs into a Bulwark of Tradition. *Social Indicators Research*, 129(2), 909–935.
<https://doi.org/10.1007/s11205-015-1137-9>
- Austin, P. C., & Stuart, E. A. (2015). Moving towards best practice when using inverse probability of treatment weighting (IPTW) using the propensity score to estimate causal treatment effects in observational studies. *Statistics in Medicine*, 34(28), 3661–3679.
- Bentzen, J. S. (2021). In crisis, we pray: Religiosity and the COVID-19 pandemic. *Journal of Economic Behavior & Organization*, 192, 541–583.
- Blair, G., Cooper, J., Coppock, A., Humphreys, M., & Sonnet, L. (2022). *estimatr: Fast Estimators for Design-Based Inference*. <https://CRAN.R-project.org/package=estimatr>
- Boguszewski, R., Makowska, M., Bożewicz, M., & Podkowińska, M. (2020). The covid-19 pandemic's impact on religiosity in Poland. *Religions*, 11(12), 1–14.
<https://doi.org/10.3390/rel11120646>
- Bonetto, E., Dezecache, G., Nugier, A., Inigo, M., Mathias, J. D., Huet, S., Pellerin, N., Corman, M., Bertrand, P., Raufaste, E., Streith, M., Guimond, S., de la Sablonnière, R., & Dambrun, M. (2021). Basic human values during the COVID-19 outbreak, perceived threat and their relationships with compliance with movement restrictions and social distancing. *PLoS ONE*, 16(6 June), 1–15. <https://doi.org/10.1371/journal.pone.0253430>
- Cutler, D. M., & Summers, L. H. (2020). The COVID-19 Pandemic and the \$16 Trillion

- Virus. *JAMA - Journal of the American Medical Association*, 324(15), 1495–1496.
<https://doi.org/10.1001/jama.2020.19759>
- Dalton, R. J., & Welzel, C. (2015). The civic culture transformed: From allegiant to assertive citizens. In *The Civic Culture Transformed: From Allegiant to Assertive Citizens*.
<https://doi.org/10.1017/CBO9781139600002>
- Daniel, E., Bardi, A., Fischer, R., Benish-Weisman, M., & Lee, J. A. (2021). Changes in Personal Values in Pandemic Times. *Social Psychological and Personality Science*.
<https://doi.org/10.1177/19485506211024026>
- Dong, N., Stuart, E. A., Lenis, D., & Quynh Nguyen, T. (2020). Using Propensity Score Analysis of Survey Data to Estimate Population Average Treatment Effects: A Case Study Comparing Different Methods. *Evaluation Review*, 44(1), 84–108.
- Fincher, C. L., Thornhill, R., Murray, D. R., & Schaller, M. (2008). Pathogen prevalence predicts human cross-cultural variability in individualism/collectivism. *Proceedings of the Royal Society of London B: Biological Sciences*, 275(1640), 1279–1285.
<https://doi.org/10.1098/rspb.2008.0094>
- Golec de Zavala, A., Bierwiazek, K., Baran, T., Keenan, O., & Hase, A. (2021). The COVID-19 pandemic, authoritarianism, and rejection of sexual dissenters in Poland. *Psychology of Sexual Orientation and Gender Diversity*, 8(2), 250–260.
<https://doi.org/10.1037/sgd0000446>
- Han, N., Ren, X., Wu, P., Liu, X., & Zhu, T. (2021). Increase of Collectivistic Expression in China During the COVID-19 Outbreak: An Empirical Study on Online Social Networks. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.632204>
- Hernan, M. A., & Robins, J. (2020). *Causal Inference: What If*. CRC Press.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, 466(7302), 29. <https://doi.org/10.1038/466029a>

- Ho, D. E., Imai, K., King, G., & Stuart, E. A. (2007). Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference. *Political Analysis*, 15(3), 199–236. <https://doi.org/10.1093/pan/mpl013>
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2005). *Cultures and organizations: Software of the mind* (2nd ed.). McGraw-Hill.
- Inglehart, R. F. (2008). Changing Values among Western Publics from 1970 to 2006. *West European Politics*, 31(1–2), 130–146. <https://doi.org/10.1080/01402380701834747>
- Inglehart, R., Foa, R., Peterson, C., & Welzel, C. (2008). Development, Freedom, and Rising Happiness: A Global Perspective (1981–2007). *Perspectives on Psychological Science*, 3(4), 264–285. <https://doi.org/10.1111/j.1745-6924.2008.00078.x>
- Inglehart, R., & Welzel, C. (2005). *Modernization, Cultural Change, and Democracy: The Human Development Sequence*. Cambridge University Press.
- International Monetary Fund. (2020). *World Economic Outlook Database*. https://www.imf.org/en/Publications/WEO/weo-database/2020/October/weo-report?c=158,&s=NGDP_RPCH,NGDPD,PPPGDP,NGDPDPC,PPPPC,PCPIPCH,&sy=2018&ey=2025&ssm=0&scsm=1&scc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1
- Jae Moon, M., Suzuki, K., Park, T. I., & Sakuwa, K. (2021). A comparative study of COVID-19 responses in South Korea and Japan: political nexus triad and policy responses. *International Review of Administrative Sciences*, 87(3), 651–671. <https://doi.org/10.1177/0020852321997552>
- Japan Broadcasting Corporation. (2021). *Infection status by prefecture*. <https://www3.nhk.or.jp/news/special/coronavirus/data-widget/>
- Karwowski, M., Kowal, M., Groyecka, A., Białek, M., Lebuda, I., Sorokowska, A., & Sorokowski, P. (2020). When in Danger, Turn Right: Does Covid-19 Threat Promote

- Social Conservatism and Right-Wing Presidential Candidates? *Human Ethology*, 35(1), 37–48. <https://doi.org/10.22330/he/35/037-048>
- Kikuchi, H., Machida, M., Nakamura, I., Saito, R., Odagiri, Y., Kojima, T., Watanabe, H., Fukui, K., & Inoue, S. (2020). Changes in psychological distress during the COVID-19 pandemic in Japan: A longitudinal study. *Journal of Epidemiology*, 30(11), 522–528. <https://doi.org/10.2188/jea.JE20200271>
- Kiley, K., & Vaisey, S. (2020). Measuring Stability and Change in Personal Culture Using Panel Data. *American Sociological Review*, 85(3), 477–506. <https://doi.org/10.1177/0003122420921538>
- Lampert, M., Inglehart, R., Metaal, S., Schoemaker, H., & Papadongonas, P. (2021). *Covid pandemic ignites fear, but boosts progressive ideals and calls for inclusive economic growth*. <https://www.worldvaluessurvey.org/WVSPublicationsDocuments.jsp?PUB=186&PUB=186>
- Levy, E., & Filippini, Y. F. (2021). *Social and economic impact of COVID-19*. www.brookings.edu/global
- Li, J., Akaliyski, P., Heisig, J. P., Löbl, S., & Minkov, M. (2022). Flexible societies excelled in saving lives in the first phase of the COVID-19 pandemic. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2022.924385>.
- Lilleoja, L., Dobewall, H., Aavik, T., Strack, M., & Verkasalo, M. (2016). Measurement equivalence of Schwartz's refined value structure across countries and modes of data collection: New evidence from Estonia, Finland, and Ethiopia. *Personality and Individual Differences*, 102, 204–210. <https://doi.org/10.1016/j.paid.2016.07.009>
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98(2), 224–253.

<https://doi.org/10.1037/0033-295X.98.2.224>

Maslow, A. (1954). *Motivation and Personality*. Harper & Brothers.

Mize, T. D., Kaufman, G., & Petts, R. J. (2021). Visualizing Shifts in Gendered Parenting Attitudes during COVID-19. *Socius: Sociological Research for a Dynamic World*, 7(1), 1–3. <https://doi.org/10.1177/23780231211013128>

Molteni, F., Ladini, R., Biolcati, F., Chiesi, A. M., Dotti Sani, G. M., Guglielmi, S., Maraffi, M., Pedrazzani, A., Segatti, P., & Vezzoni, C. (2021). Searching for comfort in religion: insecurity and religious behaviour during the COVID-19 pandemic in Italy. *European Societies*, 23(S1), S704–S720. <https://doi.org/10.1080/14616696.2020.1836383>

Na, J., Kim, N., Suk, H. W., Choi, E., Choi, J. A., Kim, J. H., Kim, S., & Choi, I. (2021). Individualism-collectivism during the COVID-19 pandemic: A field study testing the pathogen stress hypothesis of individualism-collectivism in Korea. *Personality and Individual Differences*, 183(December), 111127. <https://doi.org/10.1016/j.paid.2021.111127>

Nagasu, M., Muto, K., & Yamamoto, I. (2021). Impacts of anxiety and socioeconomic factors on mental health in the early phases of the COVID-19 pandemic in the general population in Japan: A web-based survey. *PLoS ONE*, 16(3). <https://doi.org/10.1371/journal.pone.0247705>

Nisbett, R. E. (2004). *The geography of thought: How Asians and Westerners think differently...and why*. Free Press.

O'Shea, B. A., Vitriol, J. A., Federico, C. M., Appleby, J., & Williams, A. L. (2021). Exposure and Aversion to Human Transmissible Diseases Predict Conservative Ideological and Partisan Preferences. *Political Psychology*, 0(0), 1–24. <https://doi.org/10.1111/pops.12741>

Pazhoohi, F., & Kingstone, A. (2021). Associations of political orientation, xenophobia,

- right-wing authoritarianism, and concern of COVID-19: Cognitive responses to an actual pathogen threat. *Personality and Individual Differences*, 182(June 2020), 111081. <https://doi.org/10.1016/j.paid.2021.111081>
- Pinker, S. (2018). *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress*. Viking.
- R Core Team. (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.r-project.org/>
- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, 41(1), 203–212.
- Reeskens, T., Muis, Q., Sieben, I., Vandecasteele, L., Luijkx, R., & Halman, L. (2021). Stability or change of public opinion and values during the coronavirus crisis? Exploring Dutch longitudinal panel data. *European Societies*, 23(S1), S153–S171. <https://doi.org/10.1080/14616696.2020.1821075>
- Reichelt, M., Makovi, K., & Sargsyan, A. (2020). The impact of COVID-19 on gender inequality in the labor market and gender-role attitudes. *European Societies*, 0(0), 1–18. <https://doi.org/10.1080/14616696.2020.1823010>
- Ridgeway, G., Kovalchik, S. A., Griffin, B. A., & Kabeto, M. U. (2015). Propensity Score Analysis with Survey Weighted Data. *Journal of Causal Inference*, 3(2), 237–249.
- Rosenfeld, D. L., & Tomiyama, A. J. (2021). Can a pandemic make people more socially conservative? Political ideology, gender roles, and the case of COVID-19. *Journal of Applied Social Psychology*, 51(4), 425–433. <https://doi.org/10.1111/jasp.12745>
- Samore, T., Fessler, D. M. T., Sparks, A. M., & Holbrook, C. (2021). Of pathogens and party lines: Social conservatism positively associates with COVID-19 precautions among U.S. Democrats but not Republicans. *PLoS ONE*, 16(6 June), 1–26.

- <https://doi.org/10.1371/journal.pone.0253326>
- Schwartz, S. H. (2006). A theory of cultural value orientations: Explication and applications. *Comparative Sociology*, 5(2–3), 137–182. <https://doi.org/10.1163/156913306778667357>
- Shachat, J., Walker, M. J., & Wei, L. (2021). How the onset of the Covid-19 pandemic impacted pro-social behaviour and individual preferences: Experimental evidence from China. *Journal of Economic Behavior & Organization*, 190, 480–494. <https://doi.org/10.1016/j.jebo.2021.08.001>
- Sokolov, B. (2018). The Index of Emancipative Values: Measurement Model Misspecifications. *American Political Science Review*, 112(2), 395–408. <https://doi.org/10.1017/S0003055417000624>
- Stuart, E. A. (2010). Matching methods for causal inference: A review and a look forward. In *Statistical Science* (Vol. 25, Issue 1, pp. 1–21). NIH Public Access. <https://doi.org/10.1214/09-STS313>
- Taniguchi, N., Akaliyski, P., & Park, J. (2022). People’s anxiety and evaluation of political actors under the COVID19 pandemic: Results from the first wave of the international comparative survey “Values in Crisis.” *Japanese Journal of Electoral Studies*, 37(2), 22–36.
- Taniguchi, N., & Tochiwara, O. (2018). Economic Environment and the Transformation of Civic Values. In K. Ikeda (Ed.), *Are the Japanese Changing Values? Social Networks, and Democracy* (pp. 19–43). Keiososhobo: Tokyo, Japan.
- Tormos, R. (2019). *The Rhythm of Modernization: How Values Change over Time*. Brill.
- Vaisey, S., & Kiley, K. (2021). A Model-Based Method for Detecting Persistent Cultural Change Using Panel Data. *Sociological Science*, 8, 83–95.
- Vartanova, I., Eriksson, K., Kirgil, Z. M., & Strimling, P. (2021). The Advent of the COVID-19 Epidemic Did Not Affect Americans’ Endorsement of Moral Foundations. *Frontiers*

- in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.647858>
- Welzel, C., Inglehart, R., & Klingemann, H.-D. (2003). The theory of human development: A cross-cultural analysis. *European Journal of Political Research*, 42, 341–379.
- Welzel, C. (2013). *Freedom rising: Human empowerment and the quest for emancipation*. Cambridge University Press.
- Welzel, Christian. (2012). The Myth of Asian Exceptionalism: Response to Bomhoff and Gu. *Journal of Cross-Cultural Psychology*, 43(7), 1039–1054.
<https://doi.org/10.1177/0022022112455458>
- Welzel, Christian. (2020). A cultural theory of regimes. *Nature Human Behaviour*, 4(3), 231–232. <https://doi.org/10.1038/s41562-019-0790-4>
- Welzel, Christian, Boehnke, K., Delhey, J., Deutsch, F., Eichhorn, J., & Kühnen, U. (2020). *Values in Crisis – a Crisis of Values? Moral Values under the Imprint of the Corona Pandemic*. <https://www.worldvaluessurvey.org/WVSNewsShow.jsp?ID=416&ID=416>
- Welzel, Christian, & Dalton, R. (2017). Cultural change in Asia and beyond. *Asian Journal of Comparative Politics*, 2(2), 112–132. <https://doi.org/10.1177/2057891116675978>
- Worldometer. (2022). *COVID-19 CORONAVIRUS PANDEMIC*.
<https://www.worldometers.info/coronavirus/>
- Yamazaki, S. (2019). *Survey Methodology Report*.
<https://www.worldvaluessurvey.org/WVSDocumentationWV7.jsp>
- Yoshioka, T., Okubo, R., Tabuchi, T., Odani, S., Shinozaki, T., & Tsugawa, Y. (2021). Factors associated with serious psychological distress during the COVID-19 pandemic in Japan: A nationwide cross-sectional internet-based study. *BMJ Open*, 11(7), 51115.
<https://doi.org/10.1136/bmjopen-2021-051115>
- YouGov. (2021). *COVID-19 fears*. <https://yougov.co.uk/topics/international/articles-reports/2020/03/17/fear-catching-covid-19>