

Research Article

Acceptance of COVID-19-related Government Restrictions: A Vignette Experiment on Effects of Procedural Fairness

Itaru Yanagi*, Isamu Okada[†], Yoshiaki Kubo^{**}, Hirokazu Kikuchi^{††}

Abstract: To prevent the spread of COVID-19, governments asked citizens to stay at home. If governments opt for non-coercive measures rather than coercive measures such as lockdowns, the effectiveness of governments' "stay-at-home" requests depends on the extent to which citizens accept the non-coercive measures. This study examines what factors influence the procedural fairness associated with the measures and how such procedural fairness improved or deteriorated citizens' acceptance of the measures. Japan, which relied mostly on non-coercive measures regarding social distancing, offers a good case to test this question. We carried out an online vignette survey experiment in Japan during March 2021. The vignette experiment led us to the following findings: First, regardless of recommendations of epidemiological experts, the prime minister's opinion had a negative impact on citizens' perception of fairness regarding the decision-making process, but did not show a significant effect on the eventual acceptance of non-coercive measures. Second, the non-transparent decision-making process in the government decreased the perception of fairness and acceptance of the measures. Third, the elements of opinion and transparency influenced policy acceptance through the mediation of fairness perception. Fourth, higher trust in epidemiological experts mitigated the negative effect of procedural unfairness.

Keywords: Procedural Fairness, Policy Acceptance, Vignette Experiment, COVID-19, Japan

Supplements: [Open data](#), [Preregistration](#)

Introduction

Governments worldwide instructed social distancing, also called physical distancing, as an effective way to prevent the spread of the infection of the novel coronavirus, known as COVID-19. According to Delen et al. (2020), changes in mobility patterns caused by social distancing requirements explained about 47% of the variation in infection rates. Flaxman et al. (2020) also showed that government interventions such as lockdowns significantly reduced the number of infection cases in Europe.

Governments took a variety of measures to implement social distancing, including banning large gatherings, mandating the closure of schools, limiting open hours of restaurants and bars, closing non-essential businesses, and ordering people to stay at home. Among them, the stay-at-home order was one of the strictest measures, and such statewide order was the most effective in increasing the amount of time spent at home in the United States (Abouk & Heydari, 2021).

Most of the existing studies on the effectiveness of social distancing have focused on demographic factors such as gender, age, income, education level, cohabitation, marriage, and presence of children (Guo et al., 2021; Hanibuchi et al., 2021; Hills & Eraso, 2021; Muto et al., 2020; Pedersen & Favero, 2020; Uddin et al., 2021), or on psychological factors, including perceived risk to COVID-19, psychological stress, and altruistic motivation (Cato et al., 2020; Christner et al., 2020; Guo et al., 2021; Hills & Eraso 2021; Parady et al., 2020).

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However, these studies have paid little attention to the decision-making process of government measures to promote social distancing, creating a black box on how the government decision-making process was perceived by citizens. This limitation is highly problematic because “convincing” decision-making leads to citizens’ wide acceptance of government COVID-19 measures, which is critical for the success and effectiveness of such measures in democratic countries. In order to fill this gap in the literature, this study focuses on the relationship between procedural fairness of the decision-making process and people’s acceptance of COVID-19 measures. Since Lind and Tyler’s (1988) study, a battery of studies on procedural fairness have examined how procedural aspects influence citizens’ acceptance of governmental measures, and showed that procedural fairness compels citizens to accept the measures even when the measures conflict with citizens’ interests (Brockner & Wiesenfeld, 2005).

Does procedural fairness of the decision-making process improve citizens’ view on government COVID-19 measures? If so, what kind of aspect of procedural fairness is important for citizens’ acceptance of the measures? In order to answer these questions, we fielded an online vignette experiment in Japan. Japan is an ideal laboratory to test how procedural fairness of government COVID-19 measures affects citizens’ acceptance because the country had exclusively relied on non-coercive measures (See Appendix 1). The Japanese government had only encouraged citizens to voluntarily refrain from going out.¹

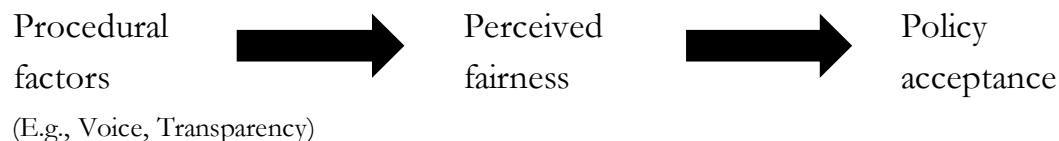
People in many countries must accustom themselves to, and therefore obey, mandatory regulations even if they do not agree with them, which makes it challenging to measure the influence of procedural fairness during the COVID-19 pandemic. However, conducting a survey experiment in a country that exclusively uses non-coercive measures, such as Japan, should allow us to accurately capture the causal impact of procedural fairness on people’s acceptance of government-mandated COVID-19 measures.

The remainder of this article is organized as follows. We provide a theoretical explanation regarding the relationship between procedural fairness and citizens’ acceptance of government measures in the next sections, followed by a discussion of our vignette experiment and the data obtained from the experiment. We then show the results of our data analysis and discuss our findings.

Theoretical Framework

Scholars of procedural fairness focus on what people perceive as fair in the process leading up to an outcome, and how these perceptions affect people’s acceptance of the outcome (Tyler et al., 1997). The factors that have received particular attention in the literature include 1) voice, the extent to which opinions are reflected in the decision-making process (Doherty & Wolak, 2012; Esaiasson et al., 2019; de Fine Licht, 2011; Grillos et al., 2021; Martin et al., 2020; Nakatani, 2021; Rhodes-Purdy, 2021; Terwel et al., 2010; Tyler, 1994; Lind & Tyler, 1988; Ulbig, 2008; Van den Bos, 2005; Van den Bos & Spruijt, 2002; Wu & Wang, 2013), and 2) transparency of the decision-making process (de Fine Licht, 2014; Doherty & Wolak, 2012; Tyler, 1994; Ruder & Woods, 2020). Furthermore, extant studies argue the mediating role of fairness perceptions in people’s acceptance of decisions (Lind et al., 1993; Tyler et al., 1997; Van den Bos, 2005). Therefore, we assume a model in which the causal relationship between procedural factors (e.g., voice and transparency) and policy acceptance is mediated by fair perception, as shown in Figure 1.

Figure 1: Conceptual model



Voice

Voice is one of the most discussed independent variables in the literature, and refers to whether individuals have the opportunity to present their opinions in the decision-making process. In principle, the more opportunities people have to present their opinions, the more likely they are to perceive the process as fair

(Jost & Kay, 2010). Originally, voice is the degree to which one's opinion is represented because the decision-making process under consideration involves outcomes that are pertinent to individuals, such as a court decision or the amount of a salary at a company. However, when the subject of analysis is to make a collective decision for a wider public, it is not realistic to presuppose all and every individual opinion is directly incorporated. Therefore, studies that target policymaking decisions conceptualize voice as the degree that diverse opinions of citizens and society (Doherty and Wolak 2012; Esaiasson et al. 2019; de Fine Licht 2011; Grillos, Zarychta, and Nelson Nuñez 2021; Martin, Mikołajczak, and Orr 2020; Nakatani 2021; Terwel et al. 2010; Tyler 1994; Ulbig 2008; Wu and Wang 2013).

There is another view that public opinion does not only deal with the representation of one's own opinion but also of politicians and experts in the decision-making process in democratic politics (Bengtsson & Christensen, 2016). Previous studies have shown that the effects of the voices of politicians and experts do not differ from the effects of the voice of citizens (de Fine Licht, 2011; Esaiasson et al., 2019). In the making of COVID-19 measures, we predict that citizens would consider the process reflecting the opinions of politicians and the public less fair than that reflecting the opinions of epidemiological experts, as the latter provides scientific reasoning and underpinning logic to prevent the spread of COVID-19.² Indeed, governments have often justified their decisions based on endorsements of epidemiological experts in many countries.

H1a: Citizens perceive a decision-making process as unfair when the decision is based on the prime minister's opinion or polls, rather than experts' opinions.

Furthermore, the absence of procedural fairness in a policy-making process makes people perceive the process as unfair, which, in turn, makes people reject the policy. Following this assumption, we posit that citizens tend not to accept policies that reflect the prime minister's opinion or polls, because they consider such decision-making to be unfair.

H1b: Fairness perceptions mediate the negative effect of the prime minister's opinion or polls on the acceptance of measures.

Transparency

Another factor that influences procedural fairness is transparency (Tyler, 1994). For example, people would feel obliged to follow decisions if the decision-making body were to hold a public hearing wherein every stakeholder expresses their opinions and does not make a decision behind closed doors. Transparency is a concept that is also related to accountability, which has received much attention in public administration. In a representative democracy, the government is expected to be accountable to the citizen, the ultimate principal. If the government cannot be held accountable for its policy decisions, democracy becomes tokenistic (Bovens 2007). Accountability requires transparency in the policy decision-making process because it allows people to understand why decisions were made (Wang and Zhang 2009).

Transparency is also an essential factor in the crisis management of infectious diseases. When a government discloses information, citizens are more likely to be convinced of the measures and be cooperative toward the government (Omi, 2011). In Japan, the first emergency declaration was issued in April 2020, but there had been criticism that the government did not explain the rationale behind the measures and the criteria for issuing and lifting the declaration (Asia Pacific Initiative, 2020).

Organizational fairness studies also note that fairness perception is enhanced when information regarding procedures and the reasons for distributional outcomes are provided (Colquitt et al., 2001). Studies examining the procedural fairness of policy decision-making processes also regard the provision of information on the rationale for the decision-making as transparency (de Fine Licht, 2014; Ruder & Woods, 2020).

We hypothesize that people perceive a measure as fair if they are informed of the rationale for its decision-making. As for the level of transparency, Mansbridge (2009) notes that

“We should favor not extreme transparency in process (for example, making all committee meetings public), but instead transparency in rationale—in procedures, information, reasons, and the facts on which the reasons are based (p. 386).”

H2a: Citizens perceive the decision-making process as fair when the rationale behind the decision-making is explained to them.

In addition, as in the case of Hypothesis 1b, we hypothesize that transparency is also mediated by fairness perceptions as it leads to the acceptance of measures.

H2b: Fairness perceptions mediate the positive effect of transparency in the decision-making process on measure acceptance.

Thus far, we have assumed that the effects of voice and transparency in the decision-making process are homogeneous among the respondents in the experiment. However, the effects of voice and transparency on measure acceptance mediated by fairness perceptions in the decision-making process might have been conditioned by trust in government and epidemiological experts. Studies on COVID-19 have shown that the higher the trust in government and science, the more likely one is to follow social distancing and health behaviors (Pagliaro et al., 2021; Schmelz, 2021). Japan has the lowest level of support for and trust in government COVID-19 measures among the G7 countries (Vardavas et al., 2021). However, even in Japan, citizens who have more trust in their government tend to comply with COVID-19 measures (Gotanda et al., 2021). There are also other studies showing that the effects of COVID-19 vaccination options on Japanese citizens differ depending on their trust in the institution (Aoki, 2022).

In addition, procedural fairness studies find a strong association between procedural fairness perceptions and political trust, and that fairness perceptions are linked to political trust (Grimes, 2017). In particular, studies focusing on the interaction between trust and fairness perceptions indicate that the effects of procedural fairness factors vary across different levels of trust in authorities (De Cremer & Tyler, 2007). Following these arguments, we assume that the effects of voice and transparency in the decision-making process on countermeasure acceptance, mediated by fairness perceptions, are conditioned by trust in government and epidemiological experts. We provide an exploratory analysis of this concern.

Methods

A Vignette Experiment

This study tests our hypotheses through a survey with a vignette experiment.³ The scenarios presented to the respondents are a policy process in which the government issues a state of emergency declaration requiring people to comply with social distancing. To test the hypotheses of this study, we exposed respondents to one of the nine scenarios that show the combination of three voice-related and two transparency-related conditions (see Table 1). This experiment is a between-subjects experimental design. Appendix 2 replicates the phrases of each vignette in English, and Online Appendix shows the original Japanese text.⁴ Appendix 3 shows a flowchart of the experimental design. An attention check was conducted at the beginning of the survey, and only those who passed this check became the subjects of the experiment (see Appendix 4). In addition, screening was conducted at the beginning of the survey to exclude health care workers, civil servants in the medical field, journalists, and people involved in any survey projects related to COVID-19. We also excluded respondents not living in Japan. Originally, we invited 3,575 people and finally obtained 1,879 respondents who completed all the questions (see Appendix 5). In the survey, a manipulation check was performed after each experiment to ensure that the experimental stimuli were correctly given to respondents (see Appendix 6). Owing to a technical problem, we failed to assign a scenario with the voice of opinion poll and no transparency, and instead duplicated a scenario with the voice of medical experts' opinion and no transparency (Vignettes D and E). In order to solve this problem, we decided to use selective vignette scenarios to meet the balance in the random assignment of variables.⁵ Specifically, we use Vignettes G, H, and I for testing the effects of voice reflection. As for testing the transparency effect, we ensure robustness by

deploying three combinations: Vignettes B and F for the first model; Vignettes B, C, D, F, G, and I for the second model; and Vignettes B, C, E, F, G, and I for the third model. The first model tests the transparency effect without any voice information—as normally assumed in a non-transparent setting—while the second and the third models check if the variability in the presence of the voice information, relative to the prime minister and epidemiological experts, plays a role in the transparency effect.

Table 1: Vignette composition

Vignettes	Voice	Transparency	<i>n</i>	Vignette used for testing voice effects	Vignettes used for testing transparency effect
A	Not shown	Not shown	206		
B	Not shown	Not transparent	212		M1 M2 M3
C	Prime minister	Not transparent	208		M2 M3
D	Medical experts	Not transparent	207		M2
E	Medical experts	Not transparent	207		M3
F	Not shown	Transparent	211		M1 M2 M3
G	Prime minister	Transparent	212	O	M2 M3
H	Opinion poll	Transparent	206	O	
I	Medical experts	Transparent	210	O	M2 M3

Note: O denotes that a vignette in question is used for testing voice effects, whereas M1, M2, and M3 denote that a vignette in question is used for model 1, model 2, and model 3 to test the effect of transparency, respectively.

Data

We fielded the vignette experiment on March 8–10, 2021. Registered respondents of Rakuten Insight, Inc., were recruited by quota sampling to be nationally representative of gender, age, and prefectures.⁶ Our survey consists of 16 questions on demographic and psychological factors, which is followed by the vignette experiment. This study was approved by the institutional review board (IRB) of the Ritsumeikan University.

Independent Variables

The key independent variables of this study are sets of dummy variables for capturing voice and transparency in the contents of each vignette. Three dummy variables were created to test hypotheses 1a and 1b: *PM* (coded as 1 if a respondent faces a vignette that contains the information on the voice of the prime minister), *Poll* (coded as 1 if a respondent faces a vignette that contains the information on the voice of a poll), and *Experts* (coded as 1 if a respondent faces a vignette that contains the information on the voice of experts). Two dummy variables were created to test hypotheses 2a and 2b: *No transparency* (coded as 1 if a respondent faces a vignette that contains the information on no-transparency) and *Transparency* (coded as 1 if a respondent faces a vignette that contains the information on transparency).

Dependent Variables

After one of the vignettes was displayed in the experiment, each respondent was asked to answer the following two questions on his/her perceptions of the decision-making process using a scale ranging from 1

to 7 or choosing the “Do not know” option. The Cronbach's alpha value for the two variables is 0.834. Descriptive statistics for the dependent variable and variables related to trust are presented in Appendix 7.

“In this hypothetical scenario, do you think the decision-making process for declaring the state of emergency was a good way to proceed as a whole?”

Strongly agree (7) to Strongly disagree (1), Do not know

“In this hypothetical scenario, to what extent do you think the decision-making process for declaring the state of emergency is a fair procedure?”

Very fair (7) to Not fair at all (1), Do not know

Based on these two questions, we deployed principal component analysis to synthesize the fairness perception of the process. As a result, one principal component (eigenvalue = 1.717) was calculated. This synthetic variable, Fairness, is the dependent variable to test hypotheses 1a and 2a.

In addition, we asked the following two questions regarding the acceptance of the measure. The Cronbach's alpha value for the two variables is 0.873. Again, a principal component analysis was conducted, and the score of one principal component (eigenvalue = 1.774) was calculated. This is called Acceptance, the dependent variable indicating the acceptance of the measure in a vignette.

“In this hypothetical scenario, to what extent do you support the measure of declaring a state of emergency?”

Strongly support (7) to Do not support at all (1), Do not know

“In this hypothetical scenario, to what extent would you be willing to accept the measure of declaring a state of emergency?”

Completely acceptable (7) to Completely unacceptable (1), Do not know

Variables Related to Trust

The survey asked a battery of questions about the trust in (1) central government, (2) local government, and (3) health scientists and epidemiological experts before the experiment, and respondents answered the questions using a seven-point scale.

“How much do you trust [the central government/local government/scientists in the healthcare field and epidemiological experts]?”

Trust a lot (7) to Not Trust at all (1)

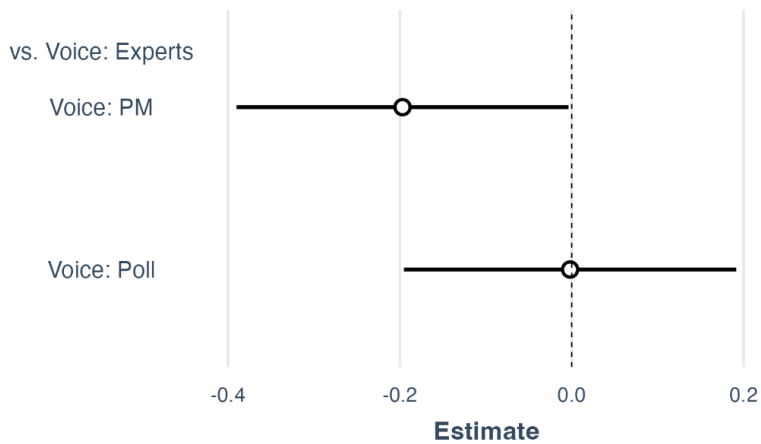
Results

Hypotheses 1a and 2a

We examine the effects of stimuli with regard to the voice involved and the transparency of the policy-making process on citizens' perceptions of fairness. Ordinary least squares (OLS) regression was conducted to estimate the causal effects. Figure 2 shows the regression coefficients for voice variables. The baseline is the scenario presenting the voice of experts. The voice of the prime minister causes lower fairness compared with that of experts. However, the voice of public opinion, as is reflected in the poll, makes no difference in

the perceived fairness compared with the voice of experts. These results partially support Hypothesis 1a on the difference between the voice reflection of the prime minister and that of experts.

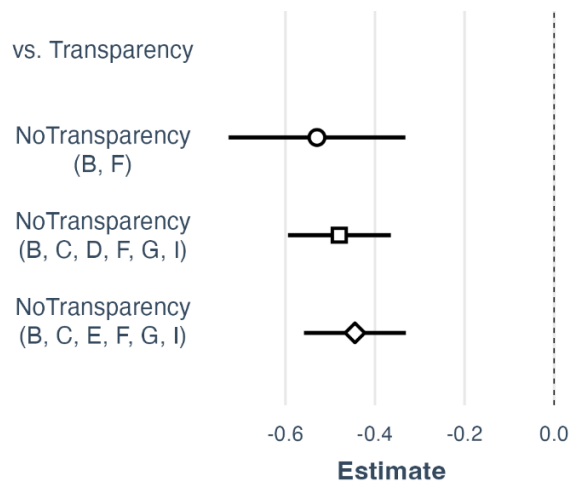
Figure 2: Voice effect on fairness



Note: White circles represent the estimates, and whiskers indicate 95% confidence intervals (robust standard errors).

Figure 3 reports the effects of non-transparency compared with the scenarios with transparency. We tested three models using different combinations of scenarios. In all the three models, the perceived fairness is significantly and substantially lower in the scenario with no transparency than with transparency. These results support Hypothesis 2a.

Figure 3: Transparency effect on fairness

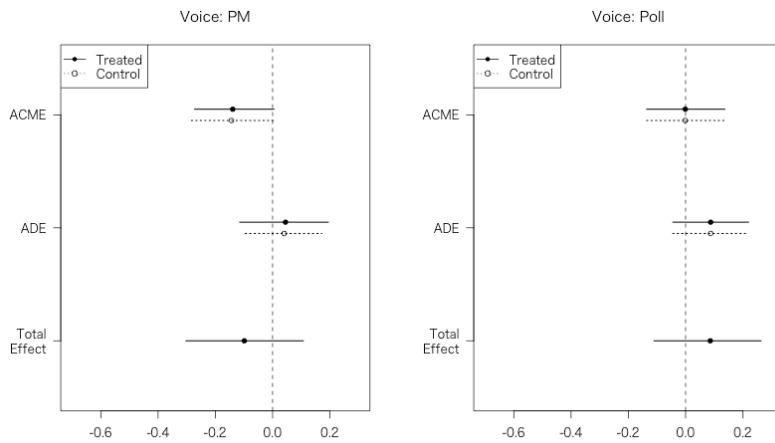


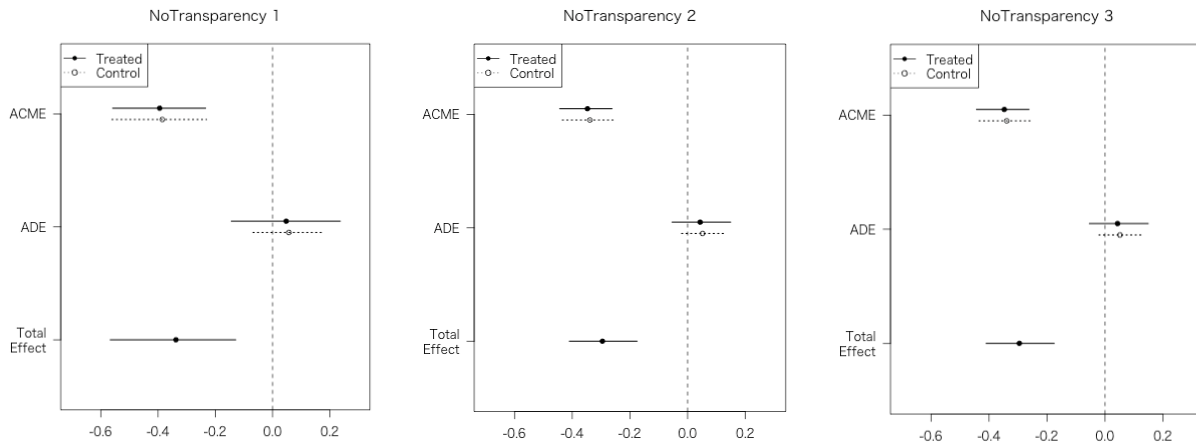
Note: Whiskers visualize 95% confidence intervals (robust standard errors)

Hypotheses 1b and 2b

We also conducted a causal mediation analysis with fairness as the mediating variable and acceptance as the dependent variable. The causal mediation effect is the indirect effect of an intervention on an outcome through a mediating variable (Imai et al., 2010; Pearl, 2001; Robins, 2003; Robins & Greenland, 1992). This study, following Imai et al. (2010), estimates average causal mediation effects (ACMEs) and average direct effects (ADEs) as mean effects in the population with an interaction term between the mediating variable and independent variables. In the analysis, Fairness is the mediating variable, and independent variables are three voice and two transparency variables (i.e., PM, Poll, Experts, No transparency, and Transparency). The R mediation package was used for the estimation (Tingley et al., 2014). Specifically, the analysis involved 1,000 simulations, each using the quasi-Bayesian Monte Carlo method based on the normal approximation. Figure 4 shows the ACME, ADE, and the total effect estimated using the mediation package in R for the voice of the prime minister, polls, and non-transparency. Non-transparency analysis was conducted for each of three different scenario sets. Black circles indicate the ACME and ADE for the treatment group (independent variable as indicated in each main title is 1), and white circles for the control group (independent variable is 0). The larger the coefficients are shown in this figure, the greater is the effect of increasing the fairness perception, and vice versa. The sensitivity analysis for the sequential ignorability assumption is reported in Appendix 9.

Figure 4: Results of causal mediation analysis





Note: Black circles indicate the ACME and ADE for the treatment group (dummy variable as indicated in each main title is 1), and white circles for the control group (dummy variable is 0).

The estimates related to voice show that ACME was significant only when the vignette specifies that the prime minister's opinion was reflected. In both the treatment and control groups, ACMEs of the prime minister, mediated by fairness, are negative and significant. The prime minister's opinion has slightly positive but not significant ADEs on the acceptance, which means there are effects not related to fairness. The results show that, when the prime minister's voice is presented, compared with when the expert's voice is presented, there is a negative effect on policy acceptance that is mediated by a decrease in fairness perception. The causal mediation analysis supports Hypothesis 1b. However, the total effect of the prime minister's voice is not significant. This means that the showing of the prime minister's voice has a positive direct effect, offsetting the indirect effect, compared with the showing of the expert's voice. Moreover, neither the ACMEs nor the ADEs nor the total effect of Poll is statistically significant. If the voice of a poll is presented, it has no effect on policy acceptance through fairness or other causal relationships than if the voice of an expert is presented. The negative effect of the prime minister's opinion mediated by fairness perception was confirmed, but the negative effect of polls was not confirmed. H1b was partially supported.

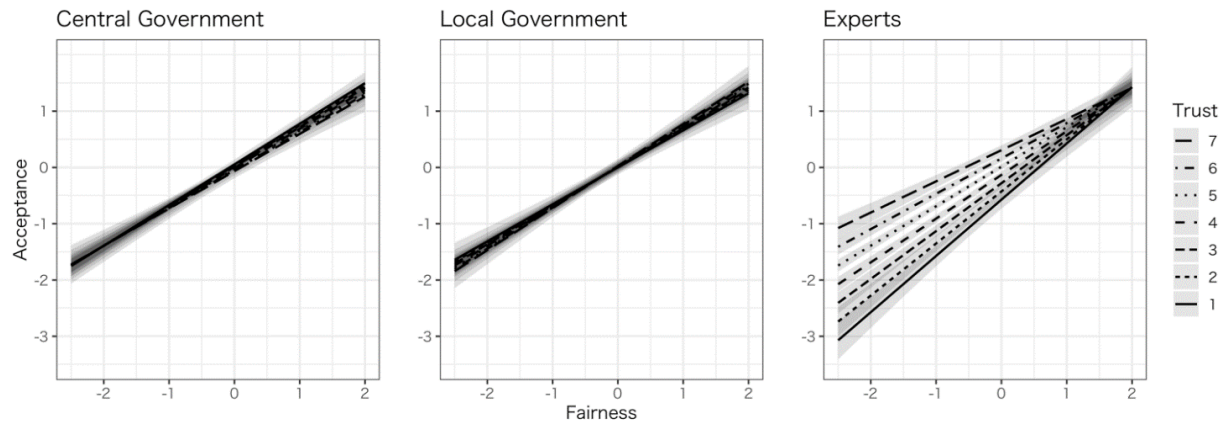
Three models on transparency show that ACME is negative and significant when the decision-making process has no transparency. Both the treatment and control groups show negative impacts on acceptance mediated by fairness. In other words, when the decision-making process is not transparent, the perception of a fair process is weakened, and consequently, the measure is less likely to be accepted. The results support Hypothesis 2b.

An Exploratory Analysis on the Role of Trust

We estimated an OLS model with acceptance as the dependent variable, and fairness, trust, and their interactions as independent variables of the concern that the effects of voice and transparency are heterogeneous. The results for the interaction between fairness and trust are visualized in Figure 5 (see Appendix 10 for the results of the full model). This figure shows that, regardless of trust in the central or local government, the change in measure acceptance in response to fairness perception is almost constant. Meanwhile, for trust in epidemiological experts, the slope for subgroups with higher trust is less steep than those with lower trust. This result indicates that the decrease in acceptance owing to the decrease in fairness

perception (increase in unfairness perception) is suppressed by high trust in epidemiological experts. In other words, the effect of voice and transparency in the decision-making process on the measure acceptance through fairness perception is conditioned by trust in epidemiological experts.

Figure 5: Interaction between fairness and trust (predicted values of acceptance based on OLS)



Note: The shaded areas indicate 95% confidence intervals.

Discussion and Conclusion

In examining the impact of the government's COVID-19 measures on citizens, it is crucial to consider the procedures by which the measures are decided upon and accepted by citizens. This article revealed how lack of procedural fairness deteriorates citizens' acceptance of these measures. The statistical results indicate that people tend to change their perception concerning the fairness of the measure and accept it less when the decision-making process lacks transparency or reflects the opinion of a certain actor than others.

Conducting the vignette experiment yielded the following three findings. First, citizens perceive the voice of the prime minister as less fair than that of epistemological experts. The former's voice leads to lower acceptance, and this effect is mediated by decreased fairness perception. Let us discuss this finding: Since the 1990s, Japan has undergone electoral and administrative reforms that have made it easier for the prime minister to exercise his leadership over issues including those related to the management of policies against the spread of COVID-19. In fact, the prime minister's power has expanded, and his opinion has sometimes had the last say in the decision-making (Takenaka, 2019). However, in the context of an infectious disease such as COVID-19, Japanese citizens may wish to rely more on scientific experts than on strong leadership.

Second, citizens perceive the voice of experts and that of public opinion to be equally fair. In the case of COVID-19, the voice of epidemiological experts is supposed to provide a rationale to regulate people's behavior by weighing infection prevention over other goals. Meanwhile, the voice of public opinion is supposed to represent not only infection spread prevention but also various opinions such as freedom of economic activities. One interpretation is that citizens have a balanced recognition of fairness between experts and diverse public opinions on the theme of COVID-19.

Third, lack of transparency in the decision-making process has a negative effect on perceived fairness and, through the mediation of this perception change, the eventual acceptance of the emergency declaration. Its effect size is larger than that of voice. This finding coincides with previous studies on procedural fairness and that specifically highlight the importance of transparency in the decision-making process of infectious disease control (Omi, 2011).

We also addressed the importance of trust, which was analyzed in the exploratory analysis. Our findings suggest that, when people trust epidemiological experts, they tend to be more accepting of measures, even

when their fairness perception is low. In other words, the Japanese public's high level of trust in healthcare and epidemiological experts may mitigate the effects of the government's non-transparent procedure.⁷ Studies on procedural fairness and those analyzing citizens' acceptance of government policies have mostly focused on the effects of trust in the government (De Cremer & Tyler, 2007; Gao et al., 2022; Garritzmann et al., 2023). A few studies report behavioral change under the pandemic significantly contingent on trust not only in government but also in citizens and science (Pagliaro et al., 2021). Our finding suggests further academic investment on variegated effects of trust in experts and science across countries.

As explained in the first section, Japan is an ideal case to study the effect of procedural fairness on citizens' voluntary acceptance of non-coercive measures. We suppose our findings can speak to other similar cases during the pandemic, although strict tests are needed in different contexts. The effect of Japanese sociocultural aspects on the behavior of the citizens in this study was not examined, because we consider it prudent to be cautious about whether historically shaped sociocultural aspects can explain the behavior of Japanese citizens during a pandemic. As an example, during the pandemic, the Japanese government encouraged citizens to be vaccinated. Japan is well known as a country with historically strong vaccine hesitancy (de Figueiredo et al. 2020). However, as of April 17, 2023, 77.96% of the total population has already been vaccinated against SARS-CoV-2. The effect of Japanese sociocultural aspects on the behavior of its citizens is a future research topic. Furthermore, this study questioned people's perceptions and did not analyze their actual behavior. The effect of the stimuli presented in this study on the actual behavior of people will be the subject of another study.

In sum, this study revealed the effect of the fairness of government procedures on people's perception of measures to prevent the spread of COVID-19. Higher procedural fairness and trust hold the key to coordinating effective collective actions under the pandemic. People's acceptance of measures was greatly influenced not only by psychological factors but also by the way the government requested citizens to take measures. According to available evidence, trust in experts has been high among the Japanese public, and it suppressed the negative effects of unfairness in the government's decision-making process. However, whether a high level of trust in experts would continue in the future is unclear, our finding recommends attention to trust as a conditioning factor. With the prolonged effects of COVID-19, restrictions on people's behavior have been relaxed in several countries, and an increasing number of countries are adopting non-coercive measures. If the government expected citizens to change their behavior voluntarily, how it decides on measures and conveys information to citizens would have a significant impact on preventing the spread of COVID-19.

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Notes

1. In Japan, the people have never been legally required to stay at home. The most stringent measure taken by the Japanese government to prevent the spread of infection was to declare a state of emergency based on the Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response (Act No. 31 of 2012). According to this Act, the prime minister decides on the geographic scope and duration to declare a state of emergency. Making a declaration follows several steps, wherein consulting experts (e.g., epidemiological experts) is crucial, although not legally required. The government action plan decided by the cabinet stipulates that the prime minister shall consult the committee in the Cabinet Secretariat, which is composed of epidemiological and other experts. After consulting the committee, the prime minister can issue emergency declarations, which enable special measures articulated by each governor of the declared prefectures. Such measures may include a battery of requests, such as requesting citizens to stay at home except when absolutely necessary (e.g., purchasing daily necessities at grocery stores and serving essential services), business facilities and restaurants to shorten their business

hours or close temporarily, music and sports events to be suspended, and schools to be closed. The Act was amended on February 3, 2021, and businesses that violated the governor's order were fined up to 300,000 yen (about USD 2,700) as an administrative penalty. However, there have been no penalties for citizens who failed to comply with the governor's request to stay at home by the time of our survey experiment.

2. To ensure external validity in the Japanese case, this article focuses on epidemiological experts in the Advisory Board of the Ministry of Health, Labour and Welfare (MHLW). In Japan, it has been routine to consult epidemiological experts for declaring a state of emergency, even if such consultation is not required by the Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response. The government consulted a committee in the Cabinet Secretariat as well as the MHLW advisory board, which involved epidemiology experts. The advisory board's recommendations were usually reflected in the eventual declaration of the states of emergency (Asia Pacific Initiative, 2020). Alternatives to experts' opinions were the prime minister's opinion and public opinion polls, which influenced some policies related to COVID-19 but not the emergency declarations in particular. For example, Prime Minister Abe told the Diet that he requested the simultaneous closure of elementary and junior high schools in March 2020 based on his own judgment without consulting experts. Newspapers pointed out that in December 2020, Prime Minister Suga decided to cancel a project to promote travel in response to the results of a poll. "Canceling the 'Go to Travel' Project: Public Opinion Pushes Back" Asahi Shimbun, December 15, 2020, 2.
3. This study was pre-registered at the Open Science Framework before the survey. The link for pre-registration is <https://osf.io/6d2zh>. Note that the text of the hypothesis had been modified to clarify the theoretical mechanism.
4. The link for Online Appendix is <https://osf.io/gv8cx>.
5. The information obtained even with the technical problem is still valuable for our test because it satisfies random assignment across selective scenarios.
6. Rakuten Insight, Inc., is one of the largest survey firms in Japan with more than two million registered respondents. Upon completion of the survey, the company paid respondents in the form of redeemable points, and the amount of which was not disclosed to the authors.
7. The Yomiuri Shimbun conducted a poll in March–April 2021 asking about people's trust in multiple targets for COVID-19 measures. According to the poll, trust in healthcare institutions (four-point scale) was high, as 44% answered trusting and 47% somewhat trusting. Trust in the government's subcommittee of epidemiological experts was also relatively high, as 21% answered trusting and 57% somewhat trusting. In contrast, trust in the Japanese government was low, as 8% answered trusting and 42% somewhat trusting. "Questions and Answers": Yomiuri Shimbun, April 30, 2021, 21.

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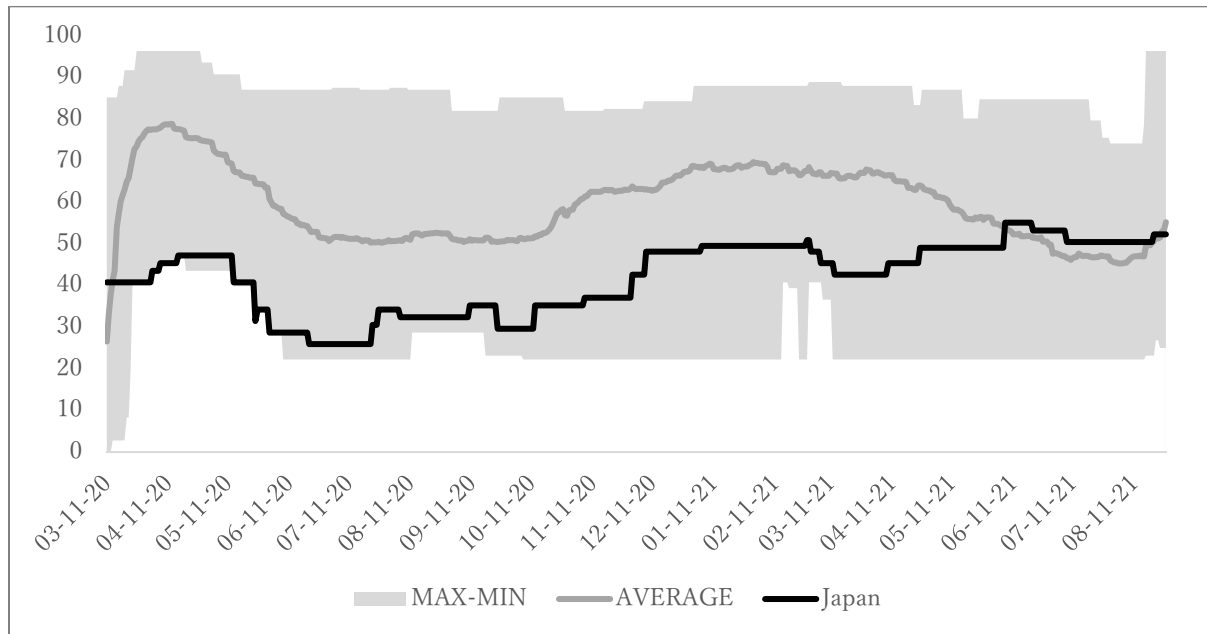
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Appendix

Appendix 1. The stringency level in Japan

The Japanese government had relied on measures that encouraged citizens to stay at home without coercive interventions. Figure A1 shows the maximum, minimum, and average values of the Stringency Index on COVID-19-related behavioral regulations for 37 Organisation for Economic Co-operation and Development (OECD) countries, including Japan, from March 11, 2020—the day on which the World Health Organization declared the pandemic—to August 27, 2021 (Hale et al., 2021). The stringency level in Japan was close to the minimum level of OECD countries until September 2020. Even in March 2021, the month in which we fielded the vignette experiment, Japan was one of the least restrictive countries. The stringency level increased gradually thereafter but remained below the OECD average during the first six months of 2021.

Figure A1: Trends in Stringency Index for Japan and 37 OECD countries



Source: Hale et al. (2021), retrieved on August 30, 2021.

Appendix 2. Text of the vignette

The leading sentences and all scenarios we used in our study are as follows. The scenarios used according to the framework of analysis in this study are scenarios C, D, E, G, H, and I. In addition, scenarios A, B, and F examine the null scenario, which has no description of voice or transparency; see Appendix 7 for the examination of the null scenario. Participants in the experiment were randomly presented with one of these nine scenarios.

We followed Van den Bos (2001) and Esaïsson et al. (2019) to build the leading sentences, which include factors in the decision-making process, in order to ensure that respondents focus on the procedural aspects in the following scenario sentences (Van den Bos, 2001). Although this may prompt attention to procedural factors, which is beneficial to the manipulation, it does not necessarily cause bias across scenarios.

In the four vignettes (B, C, D, and E), we use the negative phrase “There was no sufficient explanation from the government.” This is based on the contextual situation in Japan that explicit criticisms existed at the time of our survey. Experts have pointed out the lack of transparency in the Japanese government’s decision-making process regarding COVID-19 in 2020. In June 2020, the government’s Expert Meeting on the Novel Coronavirus Disease Control called on the government to develop a communication system with the public (Asia Pacific Initiative, 2020). Newspapers have also published articles pointing out the government’s insufficient explanations, and citizens have actually seen these negative phrases (“Prime Minister declares state of emergency, must be aware of burden of overcoming crisis”: Asahi Shimbun, April 8, 2020, 2).

Leading sentences

What are your thoughts on the following fictional scenario? Please read them carefully, as we will check later to make sure you understand them correctly. There are various components to the decision-making process on measures to prevent the spread of COVID-19. One component is the input into the decision-making process, which may reflect factors such as the prime minister’s personal opinion, the results of public opinion polls, and expert opinion. Another component is whether there is sufficient explanation from the government in making the decision, which may or may not be explained. Please answer the following questions as the government’s measures in the fictional scenario will affect your life.

A: As the spread of COVID-19 is rapidly spreading in some prefectures, the government has declared a state of emergency in those prefectures. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

B: As the spread of COVID-19 is rapidly spreading in some prefectures, the government has declared a state of emergency in those prefectures. There was no sufficient explanation from the government on how the decision was reached, the details of the discussion, or the specific criteria and rationale for the decision regarding the requirements for the declaration and lifting of the state of emergency. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

C: As the spread of COVID-19 is rapidly spreading in some prefectures, the government has declared a state of emergency in those prefectures, based on the prime minister’s personal opinion. There was no sufficient explanation from the government on how the decision was reached, the details of the discussion, or the specific criteria and rationale for the decision regarding the requirements for the declaration and lifting of the state of emergency. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

D: As the spread of COVID-19 is rapidly spreading in some prefectures, the experts on infectious disease control in the Advisory Board of the Ministry of Health, Labour and Welfare met and requested that a state of emergency be declared. Based on the experts’ request, the government declared a state of emergency in these prefectures. There was no sufficient explanation from the government on how the decision was reached, the details of the discussion, or the specific criteria and rationale for the decision requirements for the declaration and lifting of the state of emergency. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

E: As the spread of COVID-19 is rapidly spreading in some prefectures, the experts on infectious disease control in the Advisory Board of the Ministry of Health, Labour and Welfare met and requested that a state of emergency be declared. Based on the experts’ request, the government declared a state of

emergency in these prefectures. There was no sufficient explanation from the government on how the decision was reached, the details of the discussion, or the specific criteria and rationale for the decision requirements for the declaration and lifting of the state of emergency. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

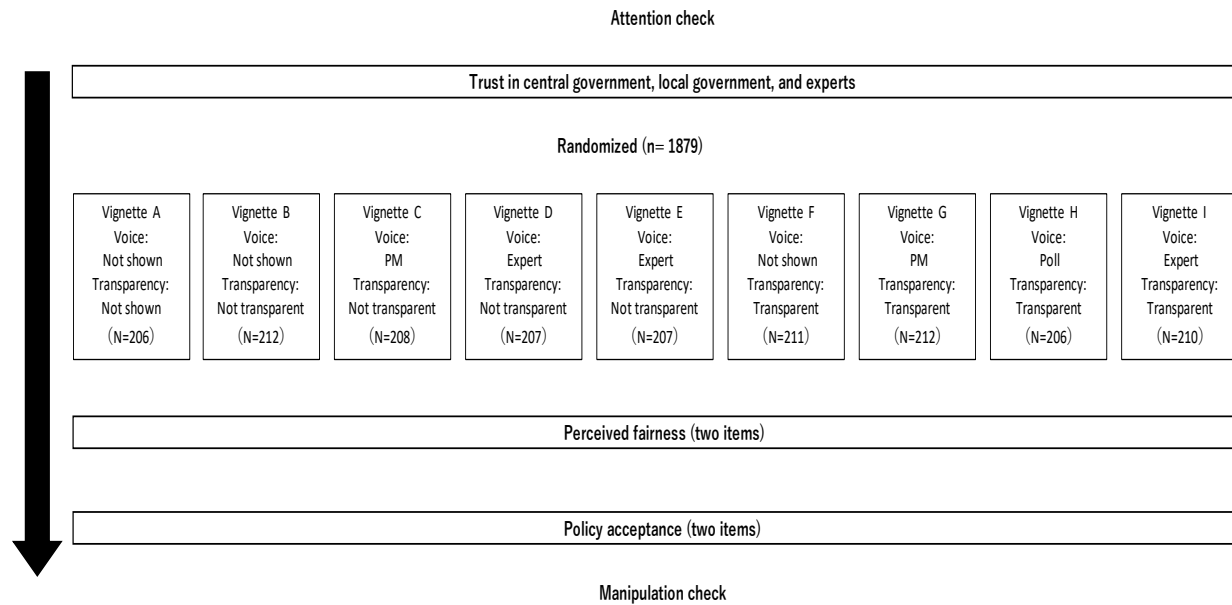
F: As the spread of COVID-19 is rapidly spreading in some prefectures, the government has declared a state of emergency in those prefectures. The government explained the background to the decision to declare a state of emergency, the details of the discussions that led to the decision, and the specific criteria and rationale for the decision regarding the requirements for the declaration and lifting of the state of emergency. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

G: As the spread of COVID-19 is rapidly spreading in some prefectures, the government has declared a state of emergency in those prefectures, based on the prime minister's personal opinion. The government explained the background to the decision to declare a state of emergency, the details of the discussions that led to the decision, and the specific criteria and rationale for the decision regarding the requirements for the declaration and lifting of the state of emergency. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

H: As the spread of COVID-19 is rapidly spreading in some prefectures, a public opinion poll conducted by the government has revealed that a majority of citizens are calling for the declaration of a state of emergency. Based on the results of the poll, the government has declared a state of emergency in these prefectures. The government explained the background to the decision to declare a state of emergency, the details of the discussions that led to the decision, and the specific criteria and rationale for the decision regarding the requirements for the declaration and lifting of the state of emergency. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

I: As the spread of COVID-19 is rapidly spreading in some prefectures, the experts on infectious disease control in the Advisory Board of the Ministry of Health, Labour and Welfare met and requested that a state of emergency be declared. Based on the experts' request, the government declared a state of emergency in these prefectures. The government explained the background to the decision to declare a state of emergency, the details of the discussions that led to the decision, and the specific criteria and rationale for the decision regarding the requirements for the declaration and lifting of the state of emergency. In response to the declaration of a state of emergency, the governor of the prefecture where you live has asked residents to refrain from going outside.

Appendix 3. Flowchart of the experiment



Appendix 4. Attention check

To improve the quality of the survey, the following attention check was conducted on the original 3,575 respondents brought in by the survey company.

1. After a detailed explanation of the background and content of the survey, the respondents were asked to select “I agree” if they accepted participation in the survey.
2. On the same screen, they were asked to select both “I agree to read well” and “I agree to read carefully” for all questions and answer choices.
3. Only those who selected the above three options were allowed to proceed to the next question.

The number of respondents who passed the above checks was 2,063. The pass rate was 57.7%.

Appendix 5. Screening and incomplete terminations in the survey

At the beginning of the survey, we screened out respondents who selected “a doctor, nurse, or medical co-worker,” “a public servant in the medical field,” “journalist,” and “working in survey company,” which are professions closely related to this topic. Only those who selected “other” proceeded to the following questions. The number of respondents screened out at this step was 118.

In the next step, we asked the prefecture of their residence. For this question, we screened out those who selected “overseas.” The screening out at this point was 3.

Other 63 respondents dropped out from answering the questions that followed. The number of respondents who reached the vignette experiment was 1,879.

Appendix 6. Manipulation check

To check whether the vignettes provided the expected stimuli, a manipulation check was conducted. After asking questions about the fairness of the process and the acceptance of the measures in the experiment, the respondents were asked to “name an element that appeared explicitly in the vignette text.” The five options were “declaration of a state of emergency,” “government decision based on the prime minister’s opinion (PM),” “government decision based on the results of a public opinion poll (Poll),” “government decision based on a request by an expert to issue the order (Expert),” and “whether or not there is an explanation from the government about what process was followed when the order was issued and why the decision was made (Transparency)” (multiple choices were allowed).

Ideally, the respondents should read the given vignette carefully and select only the items included in the vignette in the manipulation check. For example, in the case of scenario G, which describes the voice of the prime minister in issuing a state of emergency declaration and the decision-making process’ transparency, it is desirable to select only the declaration of a state of emergency, PM, and Transparency from the above five options.

Table A1 shows the respondents’ choices during the manipulation check. Comparing the selection results of the control group and the treatment group, except for the declaration of emergency, which is mentioned in all the vignettes, it can be seen that the treatment group that is given information in the vignettes tends to be more selective for all the items. In other words, as expected in this study, being informed by vignettes was not independent of respondents’ choices, and the value of the χ^2 test was significant at the 0.1% level for all items.

Table A1: Respondents' choices in the manipulation check

		control	treatment	χ^2	
PM	not selected	1218	187	262.404	***
	Selected	241	233		
Poll	not selected	1380	65	267.876	***
	Selected	293	141		
Expert	not selected	882	206	237.453	***
	Selected	373	418		
Transparency	not selected	168	785	88.010	***
	Selected	38	888		

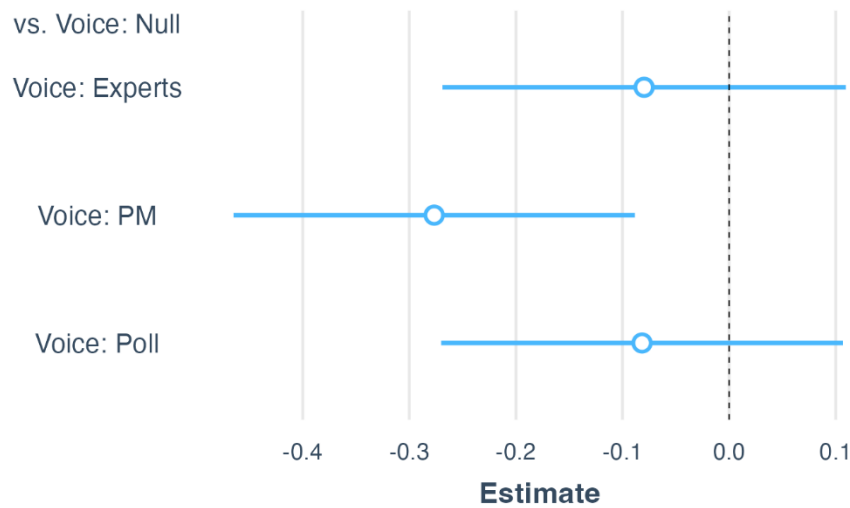
Note: *** $p < .001$. The treatment group included respondents who were given scenarios C and G for PM, scenario H for Poll, scenarios D, E and I for Expert, and scenarios F through I for Transparency. The control group included respondents who were assigned to the other scenarios.

Appendix 7. Descriptive statistics

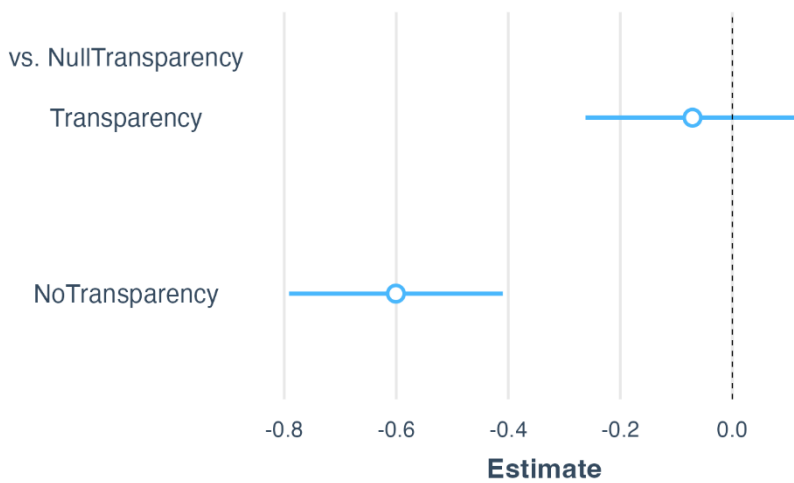
	min	max	mean	SD	N
Fairness 1: good way to proceed	1	7	4.35	1.526	1800
Fairness 2: fair procedure	1	7	4.28	1.445	1781
Acceptance 1: support the measure	1	7	4.89	1.376	1830
Acceptance 2: accept the measure	1	7	5.12	1.350	1837
Trust: central government	1	7	3.40	1.526	1879
Trust: local government	1	7	4.16	1.264	1879
Trust: experts	1	7	5.08	1.153	1879

Appendix 8. Interpreting the null scenario

Additionally, we analyzed how a scenario without any description of voice or transparency affects fairness perception. In so doing, we use the scenarios described with voice and/or transparency “Not shown” in Table 1. Figures A2 and A3 report the results. Figure A2 uses scenarios F, G, H, and I, while Figure A3 uses scenarios A, B, and F. Compared with the scenario with no description of voice, the scenario with the voice of the prime minister has a negative and significant effect on perceived fairness (Figure A2). Similarly, a scenario with a description of no transparency also has a negative and significant effect on the fairness perception compared with the no description of transparency (Figure A3).

Figure A2: Validation of null scenario: voice

Note: Whiskers visualize 95% confidence intervals (robust standard errors)

Figure A3: Validation of null scenario: transparency

Note: Whiskers visualize 95% confidence intervals (robust standard errors)

Now, we turn to explore why fairness perceptions increased despite the absence of voice or transparency statements in scenario A by narrowing down on respondents' perceptions in the scenario. We use the following three questions, elaborated based on the classical fairness criteria in Leventhal (1980), posterior to the vignette experiment.

“In this hypothetical scenario, do you think that the government listens to various opinions?”

“In this hypothetical scenario, do you think that the government makes decisions based on correct information?”

“In this hypothetical scenario, do you think that the government considers the will of the citizens?”

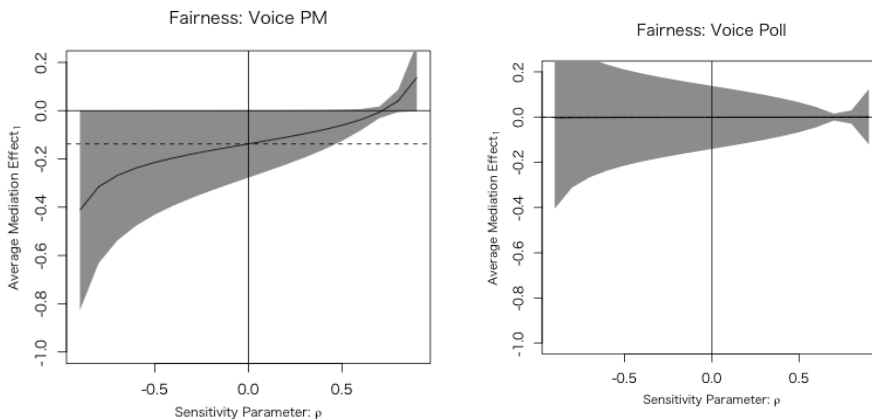
Strongly agree (7) to Strongly disagree (1), Don’t know

Table A2 shows the answer distributions of the respondents who were presented with scenario A to the three questions. More than 50% of participants manifested 5 or higher scores, showing that they agree with the statements, even though scenario A did not describe the elements asked in the questions. Although it was not possible to verify this reason directly from this study, it is assumed that the respondents took such ideal decision-making process for granted in scenario A. This interpretation is consistent with previous studies, which also assumed that, in a case where no information on procedures was given, respondents had a prior expectation that the procedures would be fair (Ruder & Woods, 2020).

Table A2: Perceptions of scenario A respondents

	1	2	3	4	5	6	7	N
Various Opinions	5.1	6.6	14.1	18.7	31.3	19.2	5.1	198
Correct Information	2.1	5.7	10.4	14.5	35.8	27.5	4.1	193
Will of the Citizens	2.0	6.5	19.6	20.1	35.2	14.1	2.5	199

Appendix 9. Sensitivity analysis for sequential ignorability





Note: The model Voice PM uses scenarios G, H, and I. No Transparency 1 uses B and F. No Transparency 2 uses B, C, D, F, G, and I. No Transparency 3 uses B, C, E, F, G, and I.

Appendix 10. OLS of acceptance: A cross-term model of fairness and trust

	Est.	S.E.	T nal.	p
(Intercept)	-0.03	0.02	-1.31	0.19
Fairness	0.69	0.02	31.75	0.00
Trust in Central Government	-0.03	0.02	-1.21	0.23
Trust in Local Government	0.00	0.02	0.15	0.88
Trust in Experts	0.17	0.02	7.98	0.00
Fairness: Trust in Central Government	-0.01	0.02	-0.65	0.52
Fairness: Trust in Local Government	0.02	0.02	0.81	0.42
Fairness: Trust in Experts	-0.08	0.02	-4.55	0.00

MODEL INFO:

Observations: 1153

Dependent Variable: acceptance

Type: linear regression

MODEL FIT:

$\chi^2(7) = 658.08, p = 0.00$

Pseudo- R^2 (Cragg-Uhler) = 0.59

Pseudo- R^2 (McFadden) = 0.29

AIC = 2370.95, BIC = 2416.40

Standard errors: MLE

Estimated dispersion parameter = 0.46

Continuous predictors are mean-centered and scaled by 1 s.d.