

Research Article

Vaccine Choice, Trust in Institutions, and the Intention to Get Vaccinated Against COVID-19: Evidence From an Online Experiment

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Abstract: Amidst the global struggle to achieve herd immunity against COVID-19, this study investigates whether the number of vaccine options (the size of the choice set) predicts the public's intention to get vaccinated, and whether this effect depends on their trust in institutions – a system in which a collection of actors – from scientists and vaccine developers to public servants and front-line health workers – is working to fight the pandemic and to develop and approve vaccines against COVID-19 and deliver them to the public. Using an online experiment conducted in Japan ($N = 600$), the study tested whether choice set sizes of 1, 2, and 4 make a difference in the intention to get vaccinated. The study found that the intention was higher when the subjects were given two vaccine options to choose from, rather than offered a single vaccine, when trust was low, but this effect was negative when the subject trusted institutions highly. The study did not find strong evidence to support the effect of presenting a choice set of four. Based on these findings, this study offers nuanced suggestions for vaccine policy.

Keywords: Experiment, Coronavirus, Vaccine choice, Vaccine hesitancy, Psychology

Supplements: [Open data](#)

Amidst the global COVID-19 pandemic, mass vaccination campaigns are underway to achieve herd immunity – a situation wherein “a significant portion of a population becomes immune to an infectious disease” (Desai & Majumder, 2020, para. 1). Herd immunity can limit the spread of the infection, but it is not feasible in the face of high *vaccine hesitancy* – “the reluctance or refusal to vaccinate” (World Health Organization, 2019) – or low *vaccine acceptance* – the willingness or intention to vaccinate – which, as studies have found, depends on a number of factors (Huynh & Senger, 2021; Karlsson et al. 2021; Lazarus et al., 2021; Loomba et al., 2021; Murphy et al., 2021(2020); Paul et al., 2021; Prati, 2020; Ruiz & Bell, 2021; Schwarzingier et al., 2021).

This study extends previous work by examining whether the number of vaccines to choose from (hereafter referred to as a “choice set size”) makes a difference in the public's intention to get vaccinated and whether this effect depends on their trust in institutions. Here, the term *institution* refers to a system in which a collection of actors – from scientists and vaccine developers to public servants and front-line health workers – is working to fight the pandemic and to develop and approve vaccines against COVID-19 and deliver them to the public.

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The study defines *trust in institutions* as the belief in the competence of institutions to produce and deliver vaccines with benevolent intentions and with the best interests of the public in mind.

At the time of this writing, in April 2021, granting a vaccine choice (the ability to choose from a list of two or more vaccines) seemed a luxury most governments simply could not afford, due to short supplies. Instead, the public were generally asked to decide between not getting a vaccine at all or, in places where a vaccine was fortunately available, accepting whichever vaccine they were offered. Still, choices were already offered in some jurisdictions. For example, the city of Berlin, Germany, publicized which vaccines were offered at the city's six vaccine centers and allowed citizens to choose the center based on their preference for one vaccine over another (Land Berlin, 2021). Similarly, in Singapore, residents could choose between the Moderna and the Pfizer vaccines by choosing a vaccination site (Lai, 2021). In light of these initiatives to offer vaccine choices in some places, it is worth asking if larger vaccine choice set sizes would boost the intention to get vaccinated against COVID-19.

Freedom of choice can have positive psychological effects on humans; however, the way it works depends on whether the act of choosing is a means to an end or an end in itself. What Sen (1988) termed an *instrumental* view of choice holds that the act of choosing is a means to an end, and humans make choices that maximize their utility or well-being. This view is the basis of rational choice theory in economics (Dan-Cohen, 1992; Tversky & Shafir, 1992; Schwartz, 2000; Sen, 1988). According to this view, having multiple options to choose from induces the positive expectation that one is likely to find a preferred option. On the other hand, freedom of choice can be an end in itself; that is, it can have intrinsic value (Sen, 1988) – the fact that one can choose might induce positive feelings of autonomy and self-control.

However, the ability to choose is not all about benefits, due to “emotional trade-off difficulty” (Luce et al., 1999, p. 144) and “choice overload” (Iyengar et al., 2004, p. 84). Since the act of choosing involves both costs and benefits, humans exhibit more complex attitudes and behaviors in reaction to freedom of choice than hypothetical rational agents, who perpetually choose utility-enhancing options from the universe of all options. The complex pattern of reactions to different choice set sizes has been captured in a series of psychological and marketing research studies (Bundorf & Szrek, 2010; Iyengar et al., 2004; Iyengar & Lepper, 2000; Reibstein & Youngblood, 1975; Reutskaja & Hogarth, 2009; Szrek, 2017).

Inspired by prior studies, the following section develops hypotheses regarding whether and why choice set size could make a difference in the intention to get vaccinated against COVID-19 and how this effect might depend on trust in institutions. The third section explains the method used to test the hypotheses; it describes an online experiment conducted on April 20, 2021, in Japan, where the researcher was located, and where, 97.5% of the population had not yet received even a single shot of vaccine as of April 12, 2021 (an estimate based on data from the Prime Minister's Office of Japan [2021] and the Ministry of Internal Affairs and Communications, Japan [2021]). The concluding section discusses the findings and draws implications for future research and vaccination policy.

Hypotheses

As far as the effect of choice set sizes for vaccines is concerned, two acts of choosing are involved – choosing to take a vaccine and choosing among vaccines if options are available. The decision one has to make in this case can be consequential, as a wrong decision can have an immediate health impact. Furthermore, whether a vaccine is worth accepting, or whether one alternative is better than another may be hard for many to determine because the disease is new to humanity, and scientific findings on side effects and reactions are still being updated. In short, the decision to get vaccinated is a high-stakes one, in that it is both important and risky, and it can be an emotionally and technically difficult decision to make for some, if not all, people.

There is reason to believe that vaccine choice might strengthen people's intention to get vaccinated. With no alternatives, people cannot be certain that a single offer is the best one if they are unable to gauge the attractiveness of alternatives (Schwartz, 2004), and thus they cannot help but think that unexplored vaccine options might have been better. Combined with the high-stakes nature of the decision, the perception that the vaccine “was rushed to the market and not sufficiently tested for both safety and efficacy” due to the expedited approval (Fadda et al., 2020, p. 711) makes people vigilant, cautious, and eager to make sure that the vaccine they are getting is a good one. Although some might still accept what is on offer anyway, due to societal pressure

and the fear of infection, others might feel that opting out (not getting vaccinated) is a safer course of action and prefer to retain control over their fate, which is psychologically relieving, if not rewarding. Consequently, even a choice set of two might help them feel less coerced and more intrinsically motivated to consider accepting a vaccine. In addition to this effect, there is an instrumental reason why the choice would incentivize people to at least consider getting vaccinated – the positive expectation that the choice set is likely to include a preferred vaccine option. Thus, the following hypothesis was proposed:

H₁: A person's intention to get vaccinated differs between situations involving a choice set of one and a choice set of two.

This hypothesis involves an average treatment effect (ATE) of giving two vaccine options.

The psychological and marketing research studies cited earlier suggest that different choice size sets have different attitudinal and behavioral consequences. This finding has inspired this current investigation into whether choice set sizes larger than two also make a difference. However, the literature does not offer a benchmark as to which sizes should be considered large or small – or “psychologically excessive” (Iyenger & Lepper, 2000) – when it comes to vaccine choice. This forces the researcher to make as thoughtful a guess as possible: four is not far from an impossible reality. Japan has a contract with three developers. With the inclusion of one more alternative, four can be considered the high end of a realistic range. Accordingly, this study tested the following hypothesis:

H₂: A person's intention to get vaccinated differs between situations involving choice sets of one and four.

The ATE of giving four options can be positive or negative. It can be negative if the psychological cost associated with choice overload exceeds the benefit of having a greater sense of control and a greater likelihood of having a better option. It can be positive if the benefit exceeds the cost.

In addition, this study considers the possibility of heterogeneous conditional average treatment effects (CATEs) across subjects with different levels of trust in institutions. The importance of trust in institutions to the intention to get vaccinated has been well evidenced in previous studies: Prati (2020) conducted a survey in Italy and found that the level of trust in institutions, measured on the basis of the respondents' rating of the trustworthiness of the Italian government, the Ministry of Health, and physicians, tended to be lower for those who had no intention to get vaccinated than for others. Murphy et al. (2020) found that persons who reported vaccine hesitancy or resistance showed lower levels of trust in the state, scientists, and health care professionals than those who reported vaccine acceptance. Lazarus et al. (2021) similarly found that the subjects who invested higher levels of trust in information from government sources were more likely to accept a vaccine.

The importance of trust in institutions is understandable. Deciding whether or not to get vaccinated can involve emotionally and technically difficult trade-offs. When people feel overwhelmed and uncertain about their choices, they tend to defer their decisions to others who are deemed to be more knowledgeable. Studies have found that those who invest trust in their advisors are more likely to accept the advisors' advice (Snizek & Van Swol, 2001; White, 2005). Likewise, if people have full trust in scientists, developers, public servants, or health care workers, who may know more about the vaccines than they do, the question of choice is of little importance because they are willing to accept whatever vaccine has been developed and approved by these experts. However, if they do not trust medical, scientific, or government institutions, they would rather choose for themselves and feel that they have control over their fate, rather than being directed by institutions they do not trust. That is why the effect of choice size sets hinges on the level of trust in institutions and why the following hypotheses were tested:

H₃: The effect of having choice sets of two, rather than just one, on the intention to get vaccinated depends on a person's level of trust in institutions.

H₄: The effect of having choice sets of four, rather than just one, on the intention to get vaccinated depends on a person's level of trust in institutions.

Empirical Strategy

This study involved an online experiment in which subjects were randomly assigned to a choice set size of 1, 2, or 4 vaccines and were asked to report whether or not they intended to get vaccinated. The study protocol, including the questionnaire, was pre-approved by the ethics committee of the researcher's institution. To recruit participants, a web survey was distributed to a panel administered by Rakuten Insight. It was targeted at 18- to 99-year-olds living in Japan at the time of the survey who had not yet been vaccinated against COVID-19, as determined through screening questions. Those who qualified were presented with information about the study and with an informed consent form onscreen. In return for completing the survey, the subjects earned points from Rakuten that could be used for future purchases, and only survey forms with complete responses were collected. The target number of completed survey forms was set at 600; this sample size was based on the funds available rather than on a formal a priori power analysis, due to the novel nature of this study. Rakuten Insight collected extra survey forms and randomly trimmed the sample to 600 before passing them on to the researcher (see Supplementary Material for an explanation of how this was done). Table 1 compares the subjects' profiles and the national population aged 18 to 99 years. The percentages of subjects in their twenties, thirties, and forties were higher than those for the national population, while individuals in their seventies were underrepresented in the sample. Males constituted 54.67% of the sample, whereas they made up 48.26% of the national population. The subjects were more highly educated, in that the percentage of university or post-graduate degree holders was much higher, at 52.83%, than that of the national population, at 20.05%. In short, the survey did not arrive at a representative sample of the national population; however, it possessed sufficient variance with regard to socio-demographic backgrounds. Almost all of the subjects had lived in Japan for 20 years or more.

At the pre-treatment stage, the subjects were asked if the following entities could be trusted to manage the coronavirus pandemic: (i) public administration, (ii) science and scientists, (iii) health care workers, and (iv) health care systems; and in regard to vaccine development and delivery, (v) pharmaceutical companies, (vi) the vaccine approval process, and (vii) the vaccine supply chain, from vaccine transport to inoculation. For each item, the subjects selected from among five responses: "strongly agree," "agree," "neither agree nor disagree," "disagree," or "strongly disagree." Seven items were displayed in a matrix question format, and the order was randomized to minimize potential order bias.

An index of trust in institutions was created, based on the subjects' responses to the seven items (the descriptive statistics for these responses can be found in the Supplementary Material). The responses were assigned numerical values, from zero for "strongly disagree" to four for "strongly agree," and a principal component analysis (PCA) was performed. The resulting PCA score turned out to be highly correlated with the average score of the seven items ($r = .9975$). Hence, the researcher used the latter in the analysis, instead of the PCA score, because understanding the meaning and value of the seven-item average was more intuitive than understanding the PCA score. The variable was labeled TRUST (mean $[M] = 2.16$, standard deviation $[SD] = 0.67$, range: 0 – 4). Cronbach's alpha for the seven items was 0.848, suggesting that they had high internal consistency.

Having responded to the questions on trust, all of the subjects were asked to carefully read the following hypothetical statement, which was modeled on the vaccination policy in Japan:

Vaccination against new coronavirus infections has begun. It is not compulsory and will be given only with the consent of the recipient after information is provided on the efficacy of the vaccine for preventing infection and on the risk of side reactions. Also, the vaccination is free of charge (fully publicly funded).

This paragraph was followed by a section titled "Vaccine Information," starting with one of the sentences below, which corresponded to the choice set size that was randomly assigned:

1. *If you wish to get the vaccine, you will receive the following vaccine.*
2. *If you wish to get the vaccine, you can choose between the two vaccines below.*
3. *If you wish to get the vaccine, you can choose from the following four vaccines.*

Immediately below this sentence, information corresponding to the choice set size (one, two, or four vaccines) was presented in a table. The vaccines described were hypothetical but realistic. Their pharmacological profiles, shown in Table 2, were those of actual vaccines available on the market, with the brand names removed to minimize the influence of brand recognition on the respondents' intention to get vaccinated. The researcher prepared 20 choice sets, which differed not only in terms of choice set sizes (1, 2, and 4), but also in terms of which vaccine or vaccines were in the choice set and the order in which they were displayed. The 20 choice sets were assigned to the subjects on a random basis, and quotas (predetermined target numbers of subjects for the groups that would receive the different choice sets) were applied. For estimating the effect of choice set size on the intention to get vaccinated, the random assignment of these choice sets to the subjects should have minimized potential order bias and cancelled out bias relating to which vaccines were included. (See Supplementary Material for a detailed account of how the choice sets were created and how they were assigned to the subjects. The material also reports the results from the balance and manipulation checks.) The binary variables CHOICE1, CHOICE2, and CHOICE4 were created to indicate whether a subject was assigned a choice set size of one, two, or four vaccines, respectively; for example, CHOICE1 took the value of 1 if the subject was assigned to a choice set size of 1, and zero if the subject was assigned to a different choice set size.

After reading the scenario statement and vaccine information, the subjects were asked if, in light of the scenario, they intended to get vaccinated. They were asked to choose from four response categories: 5.33% of the subjects responded that they were "definitely not getting the vaccination" (= 1), 17.5% were "not sure now, but leaning towards not getting the vaccination" (= 2), 53.17% were "not sure now, but leaning towards getting the vaccination" (= 3), and 24% said that they were "definitely getting the vaccination" (= 4). Therefore, nearly 76% of the sample exhibited different degrees of vaccine hesitancy. The responses to this question were directly translated into INTENTION, the dependent variable of the study.

Ordered logistic regression was used to test the hypotheses. To test the hypotheses regarding the ATEs (H_1 and H_2), Model I regressed INTENTION on choice variables CHOICE2 and CHOICE4, for which the reference group was CHOICE1. To test H_3 and H_4 , which involved CATEs, Model II included an interaction term between CHOICE2 and TRUST, and Model III included an interaction term between CHOICE2 and TRUST. Statistical significance tests were performed using two-tailed z -tests. In addition to full proportional odds models, the researcher ran partial proportional odds models, using STATA's *gologit2* command with the *autofit* option, to relax the parallel lines constraint for variables for which it was not justifiable to assume parallel lines based on Wald tests that used a stringent significance level of .01 (Williams, 2006); however, there were no such variables. The researcher also ran the models while controlling for demographic characteristics; as expected, the results (presented in the Supplementary Material) were similar to the results without controls.

Table 1
Sample ($N=600$) profile

Variables	Categories	Survey Sample		National Population
		<i>n</i>	%	%
Age	18 - 19	3	0.50	2.26
	20 - 29	111	18.49	11.75
	30 - 39	106	17.67	13.30
	40 - 49	144	24.00	17.23
	50 - 59	94	15.67	15.14
	60 - 69	91	15.17	15.10
	70 or above	51	8.50	25.22
Gender	male	328	54.67	48.26
	female	268	44.67	51.74
	neither	0	0.00	n.a.
	no response	4	0.67	n.a.
Education	primary or junior high school	18	3.00	18.75
	high school	156	26.00	46.29
	vocational school or junior college	106	17.67	14.92
	university or post-graduate	317	52.83	20.05
	others	3	0.50	n.a.
Annual income	No income	77	12.83	
	Less than 4 million yen	296	49.33	
	4 to less than 8 million yen	169	28.17	
	8 to less than 12 million yen	41	6.83	
	12 to less than 16 million yen	11	1.83	
	16 million yen or more	6	1.00	
Years of residence in Japan	less than 1	1	0.17	
	1 - 9	2	0.33	
	10 - 19	7	1.17	
	20 or above	590	98.33	

Notes: National percentage distributions were computed using the data only for the population aged 18-99. The data for age and gender distributions are from the national population estimates as of October 1, 2019. The percentage distribution of educational backgrounds was computed using data from the 2010 Census. These data were retrieved from <https://www.e-stat.go.jp>. Annual income is income before taxes and includes bonuses, income from side jobs, interest income, etc. To the best of the author's knowledge, there are no official statistics available for the income distribution of the population of Japan. This also applies to years of residence in Japan.

Table 2
Vaccine options used in the experiment and their profiles

Vaccine name	VACCINE-M87	VACCINE-X53	VACCINE-KYZ	VACCINE-9UA
Type	Viral vector	mRNA	mRNA	Viral vector
Number of doses	2 shots (12 weeks apart)	2 shots (21 days apart)	2 shots (28 days apart)	1 shot
Dosage per shot	0.5mL	0.3 mL	0.5 mL	0.5mL
Efficacy in clinical trials	81.3%	95.0%	94.1%	66.3%
Ages authorized	18 and older	16 and older	18 and older	18 and older
Temperature required for storage	2°C to 8°C	-80°C to -60°C	-25°C to -15°C	2°C to 8°C
Common side effects	• pain, redness, and swelling at the site of administration • tiredness • headache • joint pain • muscle pain • chills • fever • nausea - etc.	• pain, redness, and swelling at the site of administration • tiredness • headache • joint pain • muscle pain • chills • fever • nausea - etc.	• pain, redness, and swelling at the site of administration • tiredness • headache • joint pain • muscle pain • chills • fever • nausea - etc.	• pain, redness, and swelling at the site of administration • tiredness • headache • joint pain • muscle pain • chills • fever • nausea - etc.

Notes: See Supplementary Material for a detailed account of how these four vaccine descriptions were created based on the profiles of actual vaccines against COVID-19 available on the market at the time of designing the survey. Instead of ordinal labels using single numbers or letters, the four vaccines were labeled with strings of numbers and capital letters (M87, X53, KYZ, and 9UA), generated with a random string generator, in order to avoid any confusion on the part of the subjects that might arise from vaccines with ordinal labels (e.g., numbers) displayed out of sequence (e.g., 4, 2, 1, 3) to randomize the order.

Results

Table 3 shows the estimation results. In Model I, neither CHOICE2 nor CHOICE4 is statistically significant at the .1 level, which provides no strong evidence to support H_1 and H_2 concerning the ATEs, namely, the average effects of giving choice set sizes of 2 and 4 on the subjects' intention to get vaccinated. However, these non-significant ATEs do not mean that the treatment has no statistically significant effect on the intention of any subject to get vaccinated. Model II shows that giving two options is statistically significant and positive

(odds ratio [OR] = 3.321, 95% confidence interval [CI]: 1.005 to 10.971, $p = .049$) for the subjects who do not trust institutions at all (TRUST = 0). In contrast, the interaction term between CHOICE2 and TRUST is statistically significant at the .05 level (OR = 0.571, 95% CI: 0.343 to 0.950, $p = .031$), indicating that the effect of choice diminishes as the level of trust increases from TRUST = 0 to TRUST = 1, although the treatment effect is still positive, due to the larger positive coefficient for CHOICE2.

To further examine how CHOICE2 depends on the level of trust, the ORs of CHOICE2 were computed at different levels of trust in institutions, namely, with TRUST at 1, 2, 3, and 4. These ORs are shown in Figure 1. It is clear that CHOICE2 has a positive impact on the intention to get vaccinated when TRUST is 0, as mentioned above, or 1 (OR = 1.895, 95% CI: 0.913 to 3.932, $p = .086$). The effect becomes statistically insignificant at the .1 level when TRUST is 2. When TRUST is 3, the OR falls below one, indicating that offering two options would lower the intention to get vaccinated at this level of trust (OR = 0.617, 95% CI: 0.356 to 1.068, $p = .085$), and the effect drops further when TRUST is 4 (OR = 0.352, 95% CI: 0.132 to 0.940, $p = .037$). Taken all together, the figure shows that the effect of introducing a vaccine choice enhances the intention to get vaccinated for people whose level of trust in institutions is low but that it would work in the opposite way for people whose level of trust in institutions is high. As shown in Model III in Table 3, the OR of CHOICE4 when TRUST = 0 is not statistically significant, nor is the OR for the interaction term. This was also the case when the ORs of CHOICE4 were computed at different levels of trust in institutions, namely, when TRUST = 1, 2, 3, and 4.

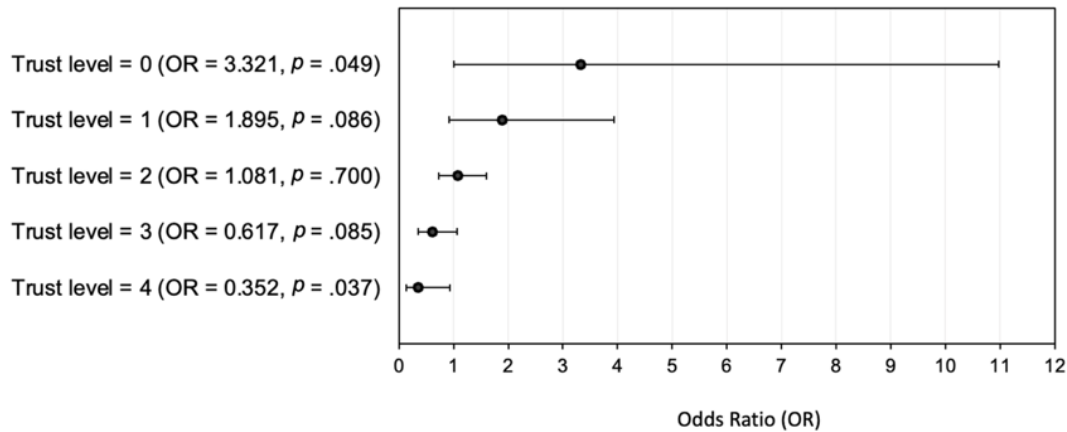
Table 3
Results from the ordered logistic regression models predicting the intention to get vaccinated
($N = 600$)

	Model I		Model II		Model III	
	OR (95% CI)	p -value	OR (95% CI)	p -value	OR (95% CI)	p -value
TRUST			4.559 (3.333 to 6.236)	< 0.001	3.399 (2.475 to 4.667)	< 0.001
CHOICE2	1.068 (0.737 to 1.547)	0.729	3.321 (1.005 to 10.971)	0.049	0.966 (0.660 to 1.413)	0.859
CHOICE2 X TRUST			0.571 (0.343 to 0.950)	0.031		
CHOICE4	0.860 (0.590 to 1.255)	0.435	0.979 (0.667 to 1.437)	0.914	0.520 (0.172 to 1.574)	0.247
CHOICE4 X TRUST					1.344 (0.817 to 2.213)	0.244

Notes: Est., coefficient expressed in logits; SE, standard error; OR, odds ratio; CI, confidence interval. p -values were calculated using two-tailed z -tests. The dependent variable is the intention to vaccinate, ranging from “definitely not getting the vaccination” (outcome = 1), “not sure now, but leaning towards not getting the vaccination” (outcome = 2), “not sure now, but leaning towards getting the vaccination” (outcome = 3), and “definitely getting the vaccination” (outcome = 4). CHOICE1 is the reference group for CHOICE2 and CHOICE4. TRUST is the average score of responses to the seven items regarding the subjects’ trust in institutions, and it is *not* centered.

Figure 1

Effects of granting options (a choice set size of two) on the intention to vaccinate, across different levels of trust in institution



Notes: The reference group is one vaccine with no option (CHOICE1). The estimation is based on Model II. The model was run five times, each with TRUST scaled differently, such that its original value of 0, 1, 2, 3, or 4 was set to zero. The horizontal bars indicate a 95% confidence interval. p -values were calculated using two-tailed z -tests.

Discussion and Conclusion

This study shows that giving the choice of two vaccines to people faced with only one option enhances their intention to get vaccinated if they have low trust in institutions. The reason for this might be that, as discussed earlier, without alternatives, people cannot be certain that a single offer is a good one, especially when they do not trust the institutions offering the vaccine. Having even one more alternative would give a sense of control and autonomy to those who remain hesitant and make them feel less coerced by institutions they do not trust. To the contrary, the study also shows that for people who trust institutions highly, giving two options would lower the intention to get vaccinated. These people might be mentally ready to accept whichever vaccine is offered by institutions they trust. When they are given a choice instead, they might fear making a wrong decision, and they would rather not accept the vaccine. This study does not offer enough evidence to reject the null hypotheses regarding CHOICE4 (that there is no average effect of CHOICE4 and that the effect depends on trust). Behind these results might be the possibility that these null hypotheses are actually true or that the survey failed to make the subjects think carefully about the descriptions of vaccine options; unlike the two-option scenario, the screenful of information on the four vaccines, crowded with text, might have appeared too much to digest, and therefore troublesome, resulting in emotional avoidance and disengagement.

Methodologically, this study has both merits and limitations. With the use of an internet panel, presenting hypothetical scenarios might have limitations, in that subjects might not think as hard about their views as they would in a real-world situation. Their responses may have been more sensitive to the treatments if the experiment had been conducted in a field or lab setting. Nevertheless, an internet survey featuring scenarios was the most feasible approach available; it enabled the researcher to collect data relatively quickly for this time-sensitive study, and to do so safely amidst the pandemic, without requiring direct human contact. The approach also made the randomization of many choice-size sets easier than it would have been in a field or lab experiment.

It would be meaningful to test the effects of choice set sizes with other samples and in other settings in Japan and elsewhere, to establish the stability of the findings. The study group for the current study might differ in many ways from groups to which the readers might want to generalize the results from this study. Such

variation seems conspicuous at the international level, as people around the world have had a variety of responses to the pandemic and the vaccines. In some places, suspicion toward vaccines and institutions has been more intense and more widespread than in others, and the issue of vaccination has been more sensitive, more politicized, and more subject to conspiracy theories and misinformation. It is also possible that the sensitivity to individual autonomy and freedom of choice might vary across locales. More studies in the future could help assess the robustness and generalizability of the conclusions from this study.

Ethical Approval

The study protocol, including the questionnaire, was pre-approved by the university's ethics committee.

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