ACR

ASIAN COMMUNICATION RESEARCH
December 2022, Vol. 19, No. 3, pp. 139-166
e-ISSN 2765-3390, p-ISSN 1738-2084
https://doi.org/10.20879/acr.2022.19.3.139

Original Research

Vaccine Policies in the Workplace

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Received
15 June 2022
Revised
10 August 2022
Accepted
19 December 2022

ABSTRACT

This research examined individuals' evaluations of organizational policies regarding vaccines. Study 1 found that individuals' vaccine hesitancy was negatively related to how legitimate it is for organizations to intervene in employees' vaccination, and this negative relationship became weaker as individuals' attitudes toward voluntary vaccination policies became stronger. Additionally, the negative relationship between vaccine hesitancy and the legitimacy of intervention in vaccination became weaker as individuals were more likely to think it was legitimate for organizations to intervene in employees' general matters. Study 2 prepared scenarios where organizational policies varied in rigidity (mandatory vs. voluntary vaccination) and the policies were implemented fairly or unfairly and examined the extent to which individuals could trust the organization. Study 2's findings showed that voluntary vaccination and fair implementation of the policy increase organizational trust in comparison to mandated vaccination and unfair implementation. Based on these findings, this research highlights the importance of considering vaccine policies in the workplace from multiple angles. With varying views on vaccination, research in this area can have the potential to promote effective vaccine policies and ultimately improve public health.

KEYWORDS

vaccine hesitancy, legitimacy, vaccine mandates, procedural justice, organizational trust

Since the outbreak of the COVID-19 pandemic in late 2019, there has been a dramatic change in many aspects. For example, wearing masks in public, taking online classes, and working from home are becoming integral parts of individuals' lives. Vaccination is widely regarded as one of the most effective interventions for returning to pre-pandemic normalcy (Moghadas et al., 2021). In an attempt to prevent the transmission of viruses, governments and employers have adopted various vaccine policies. For example, 23 states in the U.S., including New York, California, and Illinois, have implemented mandatory vaccine policies, especially for state employees (Kaiser Family Foundation, 2022). In the same vein, the New York City government

has required all employees in the city to show proof that they were vaccinated before starting work (Kimbell, 2021).

Much scholarly work has been done on the topic of vaccine policies in the workplace, especially centered around the different reactions of policies and organizations depending on socioeconomic status such as age, income, and employment (Gagneux-Brunon et al., 2021; King et al., 2021; Valckx et al., 2022) and how to resolve conflict on vaccine intervention (Băbuț et al., 2021; Dubov & Phung, 2015; Harris et al., 2011). Other possible factors affecting the evaluation of interventions and organizations include individual attitudes toward vaccines and interventions as well as types of policies. Depending on how individuals perceive the vaccine policy in the workplace, it can lead to compliance with or rejection of the policy, which is directly related to public health. Accordingly, workplace health policies can also affect the evaluation of the organizations that implement them. Therefore, this research takes a multifaceted approach to vaccine intervention at the workplace by conducting two separate studies. The first study examined attitudes toward vaccine intervention at the individual level. It can be beneficial to examine individual attitudes toward vaccine intervention in the COVID-19 pandemic context because it is unprecedented. The second study focused on the impact of different policies on the evaluation of organizations implementing the intervention. By including both internal (i.e., individual attitudes in Study 1) and external factors (i.e., characteristics of policies in Study 2), the purpose of this research is a comprehensive examination of vaccine intervention in the workplace.

Vaccine Policy in Organization

It is not new that organizations implement health policies and strive to adopt effective policies for reasons such as reducing health care costs, increasing productivity, and achieving success in business (Goetzel & Ozminkowski, 2000; Parks & Steelman, 2008; Wada & Yasuda, 2022). For a similar reason, organizations have also considered workplace policies for vaccination since the outbreak of the COVID-19 pandemic. Higher vaccination rates through the success of vaccine policies can reduce the cost of infection-related absenteeism and improve productivity (Brous, 2022; Centers for Disease Control and Prevention [CDC], 2021). Despite the similarities with other health policies, vaccine policies also show unique characteristics. They are perceived more critically than other health-related workplace programs because vaccination directly relates to the matter of survival and shows the consequences of the policies immediately (Moghadas et al., 2021). Moreover, changes induced by COVID-19, such as working from home, virtual meetings, and social distancing, have affected workers' personal and work lives (Kniffine et al., 2021). These fundamental changes in working conditions provoke a considerable amount of stress and anxiety (Băbuț et al., 2021). In other words, other issues such as smoking or alcoholism are regarded as indirectly consequential to the workforce, while transmissible diseases such as COVID-19 are taken more seriously because they instantaneously affect employees' health.

In addition, social pressure and/or support are also important considerations for compliance with health policies (Kim, 2018). Because the virus is highly contagious, vaccination can no longer be considered an individual choice. For example, if an unvaccinated person becomes infected with a virus and spreads it to a colleague, the workload of other uninfected colleagues may increase. Pressure and/or encouragement from supervisors and coworkers, and incentives and punishments from the organization, may help with vaccination rates among employees. Hallgren et al. (2021) suggest that intervention from employers could facilitate vaccination by providing information regarding vaccination and introducing a vaccination event to the worksite.

For example, several companies in South Korea have prepared a venue at the workplace where employees can get vaccinated in groups (Choi, 2021). The distinction between the vaccinated and the unvaccinated would therefore be evident, and social pressure for vaccination has become high. As a result, those who are hesitant to be vaccinated may experience a great deal of pressure, and infringement of individual choice and freedom can become an issue.

Legitimacy of Intervention in the Workplace

Even if workplace policies for vaccination are well-intentioned, the legitimacy of such interventions can be met with skepticism. Legitimacy can be defined as the conviction in the appropriateness, propriety, and justice of authorities, organizations, and societal norms (Tyler, 2006). Given that legitimacy of intervention is a determining factor of compliance and cooperation, it is crucial to identify how employees evaluate the legitimacy of the policies in the workplace (Mazerolle et al., 2013). When individuals make legitimacy evaluations, they can judge whether the intervention itself is, objectively speaking, legitimate and justified, or they can also assess the extent to which the policy is congruent with their own beliefs (Tyler, 2009). In other words, adherence to workplace policies would be motivated by not only the extrinsic characteristics of regulations (e.g., incentives and penalties) but also intrinsic reasons (e.g., individual desire and ethical judgment). Therefore, employees could differently judge the legitimacy of intervention depending on the characteristics of policies and their own criteria.

The existing body of research on interventions in the workplace has also suggested domain specificity in the judgment of interventions. For example, Klautke and Park (2011) found that the legitimacy of smoke-free policies varies across personal health orientations (e.g., anti-smoking), while for other specific interventions such as fitness, nutrition, and wellness awareness, individual characteristics such as personal health orientations did not affect the legitimacy of policies. In the same vein, employees who show high acceptance and legitimacy can present different judgments on the interventions of the vaccines. If we take into account the contexts in which unprecedented epidemics have a negative impact (e.g., higher anxiety and more stress) on employees, proactive intervention by employers might be considered justifiable and acceptable (Băbuț et al., 2021; Singh & Singh, 2020). Despite the significant impact of the pandemic, however, the degree of influence may vary among employees, which can lead to differences in the perceived legitimacy of the vaccine policies.

Health Policy and Organization Trust

Organizational policies pertinent to employees' health can influence the attitudes of individuals inside and outside the organization (Park et al., 2012; Pink-Harper & Rauhaus, 2017). Organizational trust refers to the degree to which employees' faith in an organization is related to its consistency, openness, and expectation for dependable behavior (Shockley-Zalabak et al., 2000). It also addresses the extent to which organizations are expected to be beneficial or at least innocuous to their employees (Mayer et al., 1995). In other words, the more the health policies in the workplace are perceived as beneficial or harmless, the higher the organizational trust.

People may indicate their trust towards an organization (e.g., "I believe the information that the organization provides me," "The organization is trustworthy") when they find certain organizational policies allow employees discretion rather than excessively regulating and controlling them (David, 2021). Employees may also indicate their trust towards an organization when the policy decision-making process of a

particular organization is fair, rather than when it is not (Alexander & Ruderman, 1987). The characteristics of such policies may elicit different responses to organizational trust. Vaccine policy, on the other hand, may provide a unique perspective. Vaccine policy, unlike other health policies, is new, uncertain, and life-threatening. Therefore, trust in an organization could be highly evaluated when it prioritizes the health of its members over any policy traits.

Another characteristic of organizational trust is that it can be an important indicator of attitudes toward the organization in the long term (Dyer & Chu, 2000). That is, given that high organizational trust among employees can contribute to improving job satisfaction and organizational efficiency, the achievement of trust in an organization is crucial for employers in that it may lead to the success of the business (Hoang & Shin, 2020; Isik et al., 2015; Tan & Tan, 2000). In the future, it will be essential to examine organizational trust in vaccine policy as epidemics and diseases, including COVID-19, may lead to recurring situations.

Rigidity of a Vaccine Policy

Vaccine policies can be classified as mandatory or voluntary, depending on how rigidly vaccination is required or recommended. Given that COVID-19 is novel and directly relates to health, policymakers in the workplace are more likely to implement vaccine mandates (Brown et al., 2021). Many studies have suggested the positive effects of vaccine mandates in the workplace. These coercive policies play a major role in increasing the immediate vaccination rate of employees (Blank et al., 2020; Partouche et al., 2019). As a result, the risk of transmission and absenteeism from infections would be decreased, resulting in improved productivity (Brous, 2022; CDC, 2021). Moreover, the herd immunity achieved by this regulation would contribute to normalizing the economy as well as stabilizing public health (Smetters, 2021). Similarly, from the employees' perspective, mandatory vaccine policies are preferred to voluntary policies, especially when perceived risk is high (Meier et al., 2020). In general, the higher the rigidity of how a vaccination policy is implemented, the more effective the policy is at achieving its goals (Chang & Wee, 2016). In other words, insofar as the topic is a matter of survival, employees might evaluate vaccine mandates and the authorities who implement this policy as legitimate (Savulescu, 2021).

Despite universal agreement on the efficiency of vaccine mandates, the legitimacy of these policies is controversial (Stead et al., 2019; Vrdelja et al., 2020). Mandatory policies are highly stringent, including penalties for disobedience (Attwell et al., 2018; Greer & Labig, 1987). For example, employees have been asked to submit vaccination certificates to enter the workplace (Kim, 2022). Added to this, a few cases where employees who refused to get vaccinated were fired have been reported (Fitzsimmons, 2022; Grynbaum, 2021). It can be explained by psychological reactance theory, which refers to the motivational states that might be predicted to emerge when freedom is endangered or lost (Brehm & Brehm, 1981, p. 4). Given that vaccine mandates coerce employees to comply by applying punishment to the recalcitrant, this elimination of liberty to decide whether vaccinated or not may arouse negative reactions toward the organizations that implement policies (Sprengholz et al., 2021). In other words, if the perceived threat to freedom is more pronounced than the perceived threat of certain matters, such as a pandemic, reactance would lead to a negative evaluation of the organization (Nesterkin, 2013).

Procedural Justice of Vaccine Policy

Procedural justice, defined as fairness in the decision-making process, is one of the most critical values during the implementation of policies in the workplace (Konovsky & Cropanzano, 1991). Fair procedures include, for

example, soliciting opinions prior to evaluation; having a right to question policy (Greenberg, 1986); citizen referendum (Esaiasson et al., 2019); offering explanations with a high level of sensitivity (Greenberg, 1994). In short, procedural justice pertains to employees' being able to have opportunities to participate in the decision-making process and express their opinions about the decision (Greenberg & Folger, 1983). Existing research recognizes the critical role played by procedural justice because it is closely associated with work performance, attitude toward organizations, and so on (Caza et al., 2015; Cohen-Charash & Spector, 2001; Roberts & Herrington, 2013). In addition, considering many studies (Moodley et al., 2021) suggest that procedural justice may be an effective means of resolving conflicts over vaccine policies, it is crucial to incorporate procedural fairness into the vaccine context.

Even when a vaccine policy may help with employees' health and is designed with the good intentions of the organization, individuals may respond to and evaluate the organization differently if the policy implementation does not have much procedural justice. Even for individuals who support vaccine policies, if the decision-making process is perceived as unfair, they may resent the policy and may even choose disobedience, which dampens the accomplishment of herd immunity. Organizations whose policies are enacted unfairly may not receive positive reactions.

Conversely, an emergency, such as the outbreak of a pandemic, may take precedence over procedural justice. Vaccine programs, unlike other health policies that are aimed at improving working conditions and establishing long-term health effects, are perceived more critically because they are directly related to survival (Cori et al., 2020). Furthermore, because taking in most people's opinions and having full discussions about policies and reflecting them in decision-making normally takes a certain amount of time for generating an effective response to an issue, some organizations may consider that this process can be truncated in an urgent situation. In this respect, even if the decision-making procedures are rushed, individuals might still show a favorable attitude toward the organization.

However, considering that this year, 2022, is already the third year in the era of COVID 19, individuals may have enough experience and time to have thought about the COVID 19 vaccines and, possibly, other vaccines for future viruses. It may be time to think about what can be done and how vaccination policies should be implemented. Despite its considerable significance, most studies on the fairness of vaccine policies in the workplace have only been devoted to legal or religious matters (Levin, 2017; Woods, 2021).

Individual Characteristics

Vaccine Hesitancy

Vaccine hesitancy (VH) as one of the crucial predictors of future vaccination intentions has drawn much scholarly attention. By far the most well-known definition of VH is to be found in the work of the SAGE Working Group on Vaccine Hesitancy: VH refers to a delay in acceptance or refusal of vaccination despite the availability of vaccination services. Vaccine hesitancy is complex and context-specific, varying across geographies and vaccine types (MacDonald, 2015). The majority of previous studies on VH have attempted to identify the causes of VH. For example, Soares et al. (2021) extensively shed light on the various causes of VH, such as concern for side effects, doubt on the efficacy of vaccines, trust in the government, religious conviction, and inconsistent information on vaccines. In particular, considering the timeline of development of the COVID-19 vaccines is comparatively truncated compared to other vaccines, there may be more concern about the safety of new vaccines than old vaccines, which may result in an increase in VH (Fischhoff, 2020).

Another significant aspect of VH is that the degree of VH is also affected by socio-demographic characteristics including age, income, occupation, and employment (Dror et al., 2020; Troiano & Nardi, 2021; Wang et al., 2021). For example, low-income, unemployed, and low-educated people show low levels of VH (Khubchandani et al., 2021). As a crucial indicator to show the future intention to vaccinate, VH may also play a major role in the evaluation of vaccine intervention (Gagneux-Brunon et al., 2021; Kwok et al., 2021). Given that the objective of vaccine interventions is to achieve herd immunity through larger populations vaccinated, interventions by employers may be perceived as uncomfortable for the vaccine-hesitant because of their tendency to reserve the decision. It has been noted that VH could be reinforced under vaccine mandates by precluding the chance to exchange information regarding vaccines (Kumar et al., 2016).

Overview of Studies

In general, this research examined how individuals evaluate vaccine policies at work. The two studies were designed to comprehensively investigate vaccine interventions in the organization by focusing on individual and organizational levels, respectively. With the backdrop of COVID-19, Study 1 measured individuals' general perceptions about vaccines and how legitimate it is for organizations to regulate employees' vaccination. Furthering the findings of Study 1, Study 2 used a hypothetical disease (i.e., a future pandemic-inducing virus) and scenarios depicting organizational policies that vary in rigidity and fairness and assessed how individuals respond to different types of organizational policies about vaccination.

STUDY 1

This study mainly focuses on the question of how two conflicting values (i.e., public health vs. individual liberty to decide to be vaccinated or not) can affect the perceived legitimacy of vaccine interventions. Study 1 aims to examine the relationships between individuals' various concerns about vaccination and interventions in determining the acceptability of vaccine policies in the workplace. To investigate this inquiry, individuals' own health concerns about the extent to which organizations can intervene in employees' personal matters, and their concerns about a policy being mandatory (or voluntary) are tested as predictors of perceived organizational legitimacy in vaccine interventions. Legitimacy of vaccine intervention refers to the belief in the appropriateness, propriety, and justice of organizational intervention in vaccination. Legitimacy intervention is differentiated into legitimacy of organizations intervening in employees' private affairs (e.g., organizations regulating employees' eating or working-out behaviors during off-business hours, RG) and legitimacy of organizations intervening in vaccination matters (e.g., organizations having the power to tell their employees to get vaccinated). Despite the plausible association between legitimacy of intervention and legitimacy of vaccine intervention, considering context (e.g., uncertain efficacy and side effects of vaccines), it is possible that even for individuals who support organizations' regulating some of their employees' after-business-hour activities in general, vaccination requirements may seem too intrusive. Or, conversely, in an era of the worldwide pandemic, those who recognize vaccine intervention by organizations as an attempt to protect employees from infection may not oppose workplace policies on vaccination. Added to this, individuals' vaccine hesitancy (VH) is expected to influence the degree of vaccine intervention evaluation. A growing body of literature has emphasized the importance of VH because this indecisive state could change the attitude toward complying with or refuting vaccine interventions.

The attitude toward vaccine policies (ATV) can be defined as individuals' belief or preference on whether vaccine interventions should be mandatory or voluntary. Given that freedom threats are accompanied by mandatory policies, someone who endorses a voluntary policy will show a more negative response to vaccine interventions.

H1: The low degree of VH (H1a), greater intervention legitimacy (H1b), and more agreement with voluntary vaccination (H1c) will lead to the greater legitimacy of vaccine interventions in the workplace.

It has been noted that VH has a major role in determining the evaluation of vaccine interventions (Luz et al., 2017). Added to this predicted effect, it is possible that individuals' attitudes (i.e., RG and ATV) may moderate the relationship between VH and the legitimacy of vaccine intervention (RV). Even though it is highly probable that the general propensity to champion employers' interventions spills over into domain-specific areas (i.e., vaccination), the opposite cases are still plausible. Given that the level of uncertainty on viral infection and vaccines is high in the context of the COVID-19 pandemic, those endorsing interventions from employers could refute the interference in vaccines. In this regard, examining the interaction between VH and RG is crucial to shed light on which factor is more conspicuous than others. Similarly, the proponents of mandatory policies are less likely to evaluate the vaccine interventions as legitimate due to the threats to freedom. On the contrary, those who endorse voluntary policies could show a negative response to the legitimacy of vaccine intervention when there is high awareness of VH. That is, among individuals with high RG and/or ATV, the expected negative relationship between VH and RV may not be as strong as among those with low RG and/or ATV. To put it differently, although it is expected that high VH individuals will not perceive the vaccine intervention as legitimate (RV), if they are basically positive about general interventions by employers and/or the vaccine policy is voluntary, their RV may be somewhat higher than other individuals with a negative attitude about general interventions or those facing a mandatory vaccine policy. A proposed research model for Study 1 is illustrated in Figure 1.

Or, another possibility is that vaccine hesitancy is so powerful that its relationship with RV is not

Figure 1. *The Proposed Research Model*

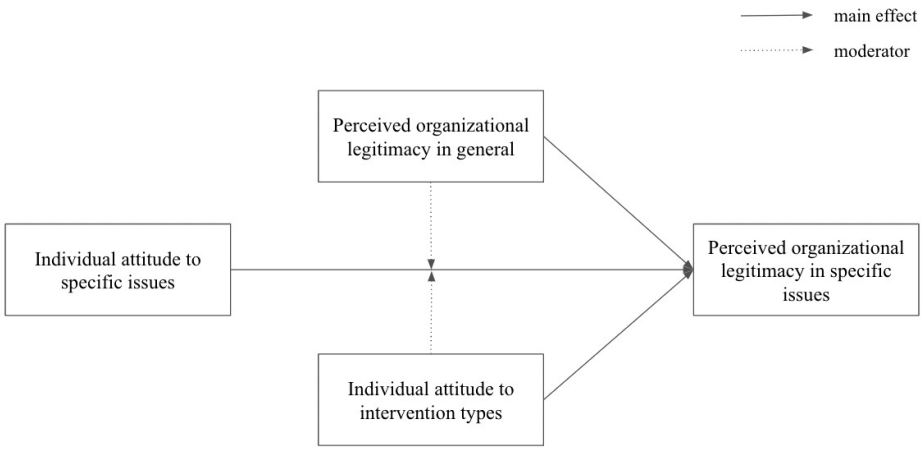


Table 1. *Demographic Information*

Gender	Age	Current employment	Current vaccine status
Female (n = 230, 51.3%)	Mean = 39.52; SD = 12.32	Employed (n = 355, 79.2 %)	Second vaccine completed (n = 397, 88.6%)
Male (n = 218, 48.7%)	18–19 (n = 25, 5.6%)	Unemployed (n = 93, 20.8%)	First vaccine only (n = 15, 3.3%)
	20–29 (n = 96, 21.4%)		No vaccine received (n = 36, 8.0%)
	30–39 (n = 101, 22.5%)		
	40–49 (n = 99, 22.1%)		
	50–59 (n = 100, 22.3%)		
	60–65 (n = 27, 6.0%)		

Table 2. *ANOVA Results for The Relationships Between Demographics and Main Variables*

Variables	Main effect	df	F	p	η^2
RG	Gender				
	Female (M = 2.19, SD = 0.78)	1	9.80	.002	.02
	Male (M = 2.44, SD = 0.94)				
VH	Age				
	18–19 ($M = 2.60_{b,c}$, SD = 0.70)				
	20–29 ($M = 2.78_{b,c}$, SD = 0.69)				
	30–39 ($M = 2.80_{c}$, SD = 0.62)	5	8.79	< .001	.09
	40–49 ($M = 2.48_{ab,c}$, SD = 0.62)				
	50–59 ($M = 2.43_{ab}$, SD = 0.54)				
	60–65 ($M = 2.15_{a}$, SD = 0.58)				
	Current vaccine status				
	Second vaccine completed ($M = 2.49_{a}$, SD = 0.56)	2	49.53	< .001	.18
	First vaccine only ($M = 3.23_{b}$, SD = 0.76)				
	No vaccine received ($M = 3.41_{b}$, SD = 0.77)				
ATV	Age				
	18–19 ($M = 2.64_{ab}$, SD = 1.25)				
	20–29 ($M = 3.19_{b}$, SD = 1.33)				
	30–39 ($M = 3.12_{b}$, SD = 1.37)	5	2.62	.024	.02
	40–49 ($M = 2.83_{ab}$, SD = 1.47)				
	50–59 ($M = 2.67_{ab}$, SD = 1.44)				
	60–65 ($M = 2.44_{a}$, SD = 1.50)				
	Current vaccine status				
	Second vaccine completed ($M = 2.73_{a}$, SD = 1.35)	2	29.00	< .001	.12
	First vaccine only ($M = 4.00_{b}$, SD = 1.41)				
	No vaccine received ($M = 4.33_{b}$, SD = 1.12)				

Note. VH = vaccine hesitancy; RG = legitimacy of intervention for general topic; ATV = attitude toward vaccine policy. Only significant results are shown here. That is, for example, gender was not significant on VH; Age was not significant on RG, ATV, etc. Means with different subscripts differ $p < .05$. Duncan was used for the multiple comparison analysis.

Table 3. *Reliabilities, Zero-Order Correlations, Means and Standard Deviations*

	VH	RG	ATV	RV
VH	(.88)			
RG	-.203**	(.89)		
ATV	.583**	-.176**	(N/A)[a]	
RV	-.548**	.423**	-.407**	(.87)
M	2.59	2.31	2.90	3.22
SD	(0.65)	(0.87)	(1.42)	(0.90)

Note. VH = vaccine hesitancy; RG = legitimacy of intervention for general topic; ATV = attitude toward vaccine policy; RV = legitimacy of intervention for vaccination. Reliability (Cronbach's α) are placed in parentheses on the diagonal.
[a]Single item.
**$p < .01$.

affected by other factors. Because VH stems from various causes, including socioeconomic factors and individuals' attitudes (Hwang et al., 2022), RG and ATV may not be strong enough to affect the effect of VH. Thus, in lieu of a hypothesis, a general research question is presented:

RQ1: Will the relationships between VH and the legitimacy of vaccine interventions in the workplace vary with different levels of RG (RQ1a) and ATV (RQ1b)?

Method

Participants and Procedure

Participants were 448 adults in South Korea. The response rate was 51.9%. Table 1 shows detailed demographic information, the number of vaccines taken, and their plan for a booster shot. Ethical approval was obtained from the Institutional Review Board at Korea University. A random probability sampling method was employed, and participants were recruited from a nationwide representative panel of a research firm, EMBRAIN, in November 2021. Table 2 showed the relationship between demographics and the main variables.

Measures

The current study referenced and modified the measures used in previous studies: the measures for legitimacy of intervention for general topics (RG) and legitimacy of intervention for vaccination (RV) were adapted from Dalsey and Park (2009) and Park et al. (2012), the measures for vaccine hesitancy (VH) were adapted from Akel et al. (2021). Attitude toward vaccine policies was measured with a single item[1] "Vaccination should be mandatory (vs. voluntary)" with a 5-point Likert scale (1 = *mandatory*, 5 = *voluntary*). Appendix A lists all the items used in the study. Table 3 lists Cronbach's α reliabilities, correlations, means, and standard deviations of the variables. All of the measures used a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Because all the measures used in this study were written in English, it was required to translate them into Korean. In this study, disagreements between translators were resolved by a group discussion after each author translated English to Korean. Appendix A lists all the items used in the study.

Confirmatory factor analysis (CFA) was conducted to see if three separate factors underlay the measurement items (5 RG items, 4 RV items, and 10 VH items). The three-factor model showed an acceptable fit: Comparative Fit Index (CFI) = .94, Incremental Fit Index (IFI) = .94, Root Mean Square Error of Approximation (RMSEA) = .072, Standardized RMR = .063. The three-factor model was better fit than one-factor ($\Delta\chi^2$ (3) = 1,214.97, $p < .001$) or any other number of factors (e.g., $\Delta\chi^2$ (2) = 316.09, $p < .001$).

Results

Hypothesis 1 and Research Question 1 asked how individuals differently evaluate the legitimacy of vaccine interventions depending on vaccine hesitancy (H1a), legitimacy of the intervention (H1b) and attitude toward vaccine policies (H1c). RQ1a pertained to the interaction between VH and RG. RQ1b also addressed the interaction between VH and ATV.

Before conducting the regression analysis, independent variables (i.e., predictors) were mean-centered to protect against nonessential multicollinearity. For interaction effects (e.g., second-order effects), the dependent variable (i.e., criterion variable) was regressed onto the product term of the predictors. To see if demographic information (e.g., sex, age, and current vaccine status) affects overall patterns of relationship between independent variables and dependent variables, we conducted hierarchical regression analysis by including demographics in the first block. Results revealed that the demographic predictors in the first block were significant, $F(3, 444) = 7.89$, $p < .001$, adj. $R^2 = .04$. The analysis showed that age ($\beta = .12$, $t = 2.49$, $p = .013$) and current vaccination status ($\beta = -.18$, $t = -3.90$, $p < .001$) were significant predictors of the legitimacy of vaccination intervention. Despite the significance, when examining their interactions with the main variables, none was significant and demographic information did not change the overall patterns of relationship between main IVs (i.e., RG, VH, ATV) and DV (i.e., RV). Hence, the details are not reported here[2].

Using hierarchical regression analysis, three main independent variables were included in the first block. In terms of product terms such as VH x ATV were entered into the second block to examine if the vaccine hesitancy (VH) would be moderated by the attitude toward vaccine policies (ATV). Table 4 reports the regression analysis results and shows the main and interaction effects.

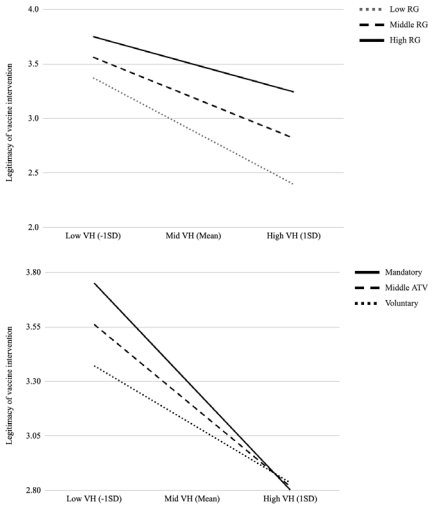
The analyses showed that the overall model including all the first- and second-order effect predictors was significant, $F(6, 441) = 56.14$, $p < .001$, adj. $R^2 = .43$. The predictors in the first block significantly contributed to the legitimacy of intervention for vaccination, $F(3, 444) = 102.66$, $p < .001$, adj. $R^2 = .41$. When the three main independent variables were entered to the first block of the regression analysis, all the variables,

Table 4. *Moderated Multiple Regression Analysis for Legitimacy of Vaccination Intervention*

	b	*SE*	β	*t*	*sr*
First block					
First-order effect					
RG	0.33	0.04	.32	8.55***	.38
VH	-0.59	0.06	-.42	-9.34***	-.41
ATV	-0.07	0.03	-.02	-2.34*	-.11
$F(3, 444) = 102.66$, $p < .001$, adj. $R^2 = .41$					
Second block					
Second-order effect					
VH X RG	0.21	0.07	.15	2.86**	.14
RG X ATV	0.02	0.03	.02	0.49	.02
VH X ATV	0.11	0.04	.13	3.05**	.14
$F_{change}(3, 441) = 6.09$, $p < .001$, $R^2_{change} = .02$					

Note. sr = semipartial correlation; RG = legitimacy of intervention for general; VH = vaccine hesitancy; ATV = attitude toward vaccine policies (1 = mandatory, 5 = voluntary). Multicollinearity was not a serious issue; VIFs (Variance Inflation Factor) of the predictors were less than 2.04. Examination of the residuals indicated no violations of assumptions.
*$p < .05$. **$p < .01$. ***$p < .001$.

Figure 2. *The Plot of The Simple Slope Analysis for the Moderator Variable RG and ATV*



Note. VH: vaccine hesitancy; RG: legitimacy of intervention for general matters; ATV: attitude toward vaccine policy. For clearer understanding, low ATV was named as Mandatory, while high ATV was named as Voluntary. Low and high points of the moderators were decided with scores of 1 *SD* below the mean and 1 *SD* above the mean, respectively.

RG, VH, and ATV were statistically significant. The results revealed that the higher the RG, the lower the VH, and the stronger attitudes toward mandatory vaccination, the higher the RV.

The second-order predictors (i.e., the two-way interaction terms) also significantly contributed to explaining variance in the legitimacy of intervention for vaccination. As shown in Table 4, RG moderating the effect of VH and ATV moderating the effect of VH were significant. Figure 2 shows the simple slopes of predictors on criterion variables at three points of moderators. The first significant interaction relating to RG as the moderator of the relationship between VH and RV showed that for individuals with low RG, the simple slope was negative (b = -0.76, SE = 0.08, p < .001), but as RG increased, the simple slope became less negative; the simple slope, b = - 0.57, SE = 0.07, p < .001 at the mean of RG; b = -0.39, SE = 0.10, p < .001 for high RG. The second significant interaction with ATV and VH indicated that for individuals who agreed with vaccine mandates, the simple slope was negative (b = -0.73, SE = 0.09, p < .001), and for individuals who showed the mean level of ATV, the simple slope was negative (b = -0.57, SE = 0.07, p < .001). As they showed more agreement with vaccine voluntary policy, the simple slope became even less negative (b = -0.41, SE = 0.08, p < .001).

Discussion

The findings of this study suggested that individuals who assess the intervention of employers as legitimate are more likely to perceive vaccine interventions by employers as legitimate as well. A number of recent studies have shown the importance of individual differences in reactions to vaccine policies (Murphy et al., 2021; Soares et al., 2021; Troiano & Nardi, 2021). On the question of the relationship between vaccine hesitancy and the legitimacy of vaccine intervention, this study found that vaccine hesitancy is negatively related to the legitimacy of vaccine interventions. Finally, proponents of vaccine mandates may be more inclined to accept vaccine intervention than those of vaccine voluntary policies. Findings showed that the higher the VH, the lower the evaluation of the legitimacy of the vaccine policy. That is, the relationship between vaccine hesitancy and the legitimacy of vaccine intervention was more likely to be negative for individuals who were less likely to believe that it was legitimate for organizations to intervene in employees' personal matters in general. As for whether individuals support mandatory or voluntary vaccination, the relationship between VH and the legitimacy of vaccine intervention was more likely to be

negative. In particular, as the degree of consent to the mandatory vaccine policy increased, VH had a stronger negative relationship with the legitimacy of vaccine interventions.

STUDY 2

Based on the findings of Study 1, Study 2 was designed to advance understanding of vaccine policies in the workplace. Study 1 focused on how different attitudes toward vaccination and intervention can intensify or alleviate the legitimacy of vaccine policies at workplaces. By examining different dimensions (i.e., vaccines and intervention), it emphasizes the importance of considering individual differences before initiating vaccine interventions in the workplace. Now, a further question is how organizations can devise and implement a policy if it aims to promote vaccination. By shifting the focus of the study from individuals to the characteristics of policies, it may have a chance to shed light on the overall process of health campaigns and provide a comprehensive explanation for it. Even for individuals with a high level of vaccine hesitancy and/or a strong belief that organizations should not regulate employees' personal affairs or after-business hours activities, organizations may need to find a way to ease individuals' concerns and, hopefully, prevent individuals' objections or distrust in organizations. Study 2 proposes that when a policy promotes voluntary vaccination and its implementation is fair, individuals' responses will be positive. Specifically, Study 2 focused on how individuals indicate different levels of trust in organizations depending on the types of policies. While the legitimacy of vaccine intervention in Study 1 can address the effects of policies and programs in particular domains (i.e., vaccination) in the short term, organizational trust can be an important indicator of attitude from a long-term perspective as well as an indirect indicator of the success of policies (Dyer & Chu, 2000). As previous studies on workplace health policies have suggested, how the policies are implemented is also crucial in determining employees' trust in the organization (Laschinger et al., 2012). Thus, Study 2 was conducted with a focus on the two different types of policies (i.e., rigidity of policies and procedural justice) by devising scenarios. The following hypotheses are advanced:

H2: Individuals will indicate greater organizational trust for an organization that implements a voluntary vaccine policy than for an organization that implements vaccine mandates.

H3: Individuals will indicate greater organizational trust for an organization with procedurally fair vaccine policy than for an organization with procedurally unfair.

Furthermore, it is expected that the negative effect of policy rigidity on organizational trust will be more pronounced when the policy is unfair than when it is perceived as fair. That is, for mandatory policies as opposed to voluntary ones, an unfair process of policy implementation will lead to lower organizational trust than a fair one will. Thus, the following hypothesis is advanced.

H4: The impact of rigidity on organizational trust will be greater when procedural justice is high than when procedural justice is low.

Method

Participants

Participants were 132 adults in South Korea. The response rate was 33.4%. Table 5 shows detailed demographic information and the number of vaccines taken. A random probability sampling method was taken, and participants were recruited from a nationwide representative panel of a Korea research firm, EMBRAIN, in

Table 5. *Demographic Information*

Gender	Age	Current employment	Current vaccine status
Female (n = 68, 51.5%)	Mean = 38.92; *SD* = 15.39	Employed (n = 87, 65.9 %)	Booster shot completed (n = 89, 67.4%)
Male (n = 64, 48.5%)	18–19 (n = 21, 15.9%)	Unemployed (n = 45, 34.1%)	Second vaccine completed (n = 32, 24.2%)
	20–29 (n = 24, 18.2%)		First vaccine only (n = 2, 1.5%)
	30–39 (n = 23, 17.4%)		No vaccine received (n = 9, 6.8%)
	40–49 (n = 23, 17.4%)		
	50–59 (n = 18, 13.6%)		
	60–65 (n = 23, 17.4%)		

March 2022. Prior to main analyses, this study conducted Analysis of Covariance (ANCOVA) with demographic information[3] as a covariate to control demographics. The results showed that the current vaccination status was statistically significant, $F(1, 127) = 7.17$, $p = .008$, $\eta^2 = .04$. This study did not include current vaccination status in the main analyses because it did not affect the hypothesized relationship between the main IVs (i.e., rigidity of policies and procedural justice) and the DV (organizational trust).

Research Design and Procedure

The study was conducted by using a 2 (i.e., rigidity: mandatory vs. voluntary) x 2 (i.e., procedural justice: fair vs. unfair) between-subjects factorial design. To examine the influence of different types of policies on the evaluation of organizations, this study devised a scenario. is used for this study. To begin the experiment survey, all participants who agreed to participate in this study completed questionnaires regarding demographic information (e.g., age, gender, employment, etc.) and current vaccination status. Subsequently, they were instructed to imagine a hypothetical situation where a new virus, *Solaber25,* has emerged after the COVID-19 pandemic. In order to rule out potential confounds for the current vaccination status and perception of the vaccines, we devised a new condition where all participants are on the same basis. All the participants read an identical acknowledgement (of a fictitious company, S&Y Group), which expressed gratitude for the success of vaccine policies (e.g., immunization and increase in annual sales). Given that procedural justice often correlates with outcomes (Greenberg & Colquitt, 2005; Martin et al., 2022), this study made the outcome of vaccine policy a constant by fixing it as successful while manipulating procedural justice. After reading the acknowledgement, participants received additional information that differed along two dimensions; rigidity and procedural fairness regarding the organization's vaccine policy. Then, participants were asked to complete the second section of the questionnaire, which included manipulation check items and organizational trust. Scenarios are presented in detail in Appendix B.

Measures

The current study referenced and modified the measures used in previous studies. Because previous studies developed all the measures in English, it was required to translate them into

Korean. In this study, disagreements between translators were resolved by a group discussion after each author translated English to Korean. All measures used a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). Appendix A lists all the items used in the study.

Manipulation Check

Two types of rigidity of a vaccine policy and two types of procedural fairness were manipulated as independent variables. Perceived rigidity was measured in order to identify one type of rigidity as more rigid than the other. Participants' perceptions of procedural justice were measured to see if participants perceived the two types of procedural fairness differently. In sum, rigidity and procedural fairness were measured as independent variables and used as manipulation checks.

Rigidity. Rigidity was operationalized in terms of whether implementation of the vaccine policy was mandatory (i.e., high rigidity) or voluntary (i.e., low rigidity) for employees. Each condition is presented in detail in Appendix B.

To check if the mandatory policy would be perceived as more rigid than the voluntary policy, four items (Cronbach α = .83) were used to measure perceived rigidity. Items from the perceived rigidity scale (Park et al., 2012) were selected and adapted for the purpose of this research. Participants who read the high-rigidity description scored higher on perceived rigidity (M = 5.14, SD = 0.96) than did those who read the low-rigidity description (M = 3.77, SD = 1.30), $t(130) = 6.87$, $p < .001$, $\eta^2 = .27$. The results suggest that the rigidity manipulation was successful.

Procedural Justice. The high procedural justice condition described a decision-making process to ensure the participation of employees and democratic procedure, including a poll. In contrast, the low procedural justice condition described how the organization arbitrarily decides the policy and ignores the opposite opinions. Each condition is presented in detail in Appendix B.

To check if participants considered the two types of procedural fairness to differ from one another, six items (Cronbach α = .93) were used to test the difference between procedural fairness and unfairness manipulation. Items from the procedural justice scale (Folger & Konovsky, 1989) were selected and adapted for the purpose of this research. Participants who read the high procedural justice description scored higher on perceived procedural fairness (M = 4.27, SD = 1.29) than did those who read the low procedural fairness description (M = 3.20, SD = 1.45), $t(130) = 5.34$, $p < .001$, $\eta^2 = .18$. Thus, procedural fairness manipulation was successful.

Dependent Variable

Organizational Trust. The measure for this variable used four items from Cook and Wall (1980) and two items from Tellefsen and Thomas (2005) and modified them slightly for this study. Six items (Cronbach α = .92) measured the extent to which individuals considered the organization (S&Y Group) to be a reliable workplace and thought they could benefit from S&Y Group.

Factor Analysis

Confirmatory factor analysis (CFA) was conducted to see if the measurement items (4 rigidity items, 6 procedural justice items, and 6 organizational trust items) were indicators of three separate factors. The three-factor model showed an acceptable fit: CFI = .97, IFI = .97, Root Mean Square Error of Approximation (RMSEA) = .067, Standardized RMR = .055. The three-factor model was better fit than one-factor ($\Delta\chi^2$ (3) = 234.81, $p < .001$) or any other number of factors (e.g., $\Delta\chi^2$ (2) = 72.20, $p < .001$).

Results

Overview

A 2 (rigidity: mandatory vs. voluntary) x 2 (procedural justice: fair vs. unfair) between-

subjects ANOVA was used to test the three hypotheses. A main effect between rigidity and procedural justice provided tests for Hypothesis 2 and 3. An interaction effect between rigidity and procedural justice provided tests for Hypothesis 4.

Main Analyses

Table 6 shows the 2 x 2 ANOVA results. Means and standard deviations are also shown in Table 6. Hypothesis 2 pertained to the effect of the rigidity of policy on organizational trust. The main effect for rigidity was significant, $F(1, 128) = 13.36$, $p < .001$, $\eta^2 = .08$. Individuals showed higher trust for organizations that implemented a voluntary vaccine policy than for those that implemented a vaccine mandate.

Hypothesis 3 was about the procedural justice of policy implementation. The analysis revealed a significant main effect for procedural justice, $F(1, 128) = 16.06$, $p < .001$, $\eta^2 = .10$. Individuals showed stronger trust in the organization with a procedurally fair vaccine policy than for the organization with a procedurally unfair policy.

Hypothesis 4 pertained to the interaction effect between the rigidity of policy and procedural justice on organizational trust. The interaction effect between rigidity and procedural justice was not significant, $F(1, 128) = 0.11$, $p = .743$, $\eta^2 < .01$. Inconsistent with the hypothesis, the effect of rigidity on organizational trust did not differ for fair and unfair procedure conditions. As Table 6 indicated, the results indicated that there was no significant interaction effect between the rigidity of policy and procedural justice.

Discussion

This study examined vaccine policies in the workplace by examining how employees' trust in an organization would be affected by different vaccine policies. The findings of this study suggested that individuals may highly evaluate organizational trust with procedural justice and voluntary policies. Despite the fact that vaccine policies are taken more seriously than other policies, our study indicated that how strictly they are implemented (i.e., rigidity) and how the policies are determined (i.e., procedural justice) are still major concerns. In simpler terms, there was no exception to the vaccine policy in the workplace. Unlike our prediction, we found that there is no interaction between rigidity and procedural justice. It suggested that individuals may separately perceive the rigidity and procedural justice in the policy. Meanwhile, although we created a hypothetical virus and vaccine policy in this study, it is possible that participants were impacted by real-world situations similar to the hypothetical scenario.

Table 6. *A 2 (Rigidity: Mandatory vs. Voluntary) x 2 (Procedural Justice: Fair vs. Unfair) Between-Subjects ANOVA Results for Hypothesis Testing*

Hypothesis	Main and Interaction Effect	*df*	*F*	*p*	η^2
H2	**Rigidity type** mandatory ($M = 3.90$, $SD = 1.32$) voluntary ($M = 4.60$, $SD = 1.16$)	1	13.36	< .01	.10
H3	**Procedural justice type** fair ($M = 4.65$, $SD = 1.18$) unfair ($M = 3.85$, $SD = 1.13$)	1	16.06	< .01	.08
H4	**Rigidity type X Procedural justice type** For mandatory, fair ($M = 3.81$, $SD = 1.12$) unfair ($M = 3.02$, $SD = 1.24$) For voluntary, fair ($M = 4.67$, $SD = 1.23$) unfair ($M = 3.74$, $SD = 1.35$)	1	0.11	.74	< .01

Given that this study was done in March 2022, the results might have differed if it had been done right after the outbreak of the pandemic and/or way after it was completely over.

GENERAL DISCUSSION

This research addresses the questions of how individuals decide whether to comply with the health interventions or not under the conflicting two fundamental values in vaccination: public health and individual liberty. Based on this inquiry, this study investigated how individuals put different evaluations on vaccine policies in the workplace. Across the two studies, the most obvious finding is that the evaluations of vaccine interventions and policies vary with both individual attitudes and policy characteristics. It may suggest the importance of considering vaccine policies in the workplace from various angles.

In Study 1, the results show that the relationship between the perceived legitimacy of vaccine policies and individual attitudes is statistically significant. Specifically speaking, the extent to which individuals agree with organizational intervention in general is positively related to the legitimacy of vaccine interventions specifically. It has been suggested that individuals indicate differing views on general and specific types of intervention (Klautke & Park, 2011). This differs from the findings presented in this study. For vaccine-specific indicators (i.e., VH and ATV), there was a statistically significant negative relationship. With successive increases in the intensity of the VH, the perceived legitimacy of vaccine policies moved further in a negative direction. It was also reported that those who support vaccine voluntary policies indicate a more negative evaluation of the legitimacy of vaccine interventions than do those who support vaccine mandates.

The results also revealed that when individuals showed low RG, the slope between VH and RV was steeper in the negative direction. In other words, among individuals who refuse organizational control over their personal matters in general, those with high VH are less likely to believe that organizations have the right to ask their employees to be vaccinated. In the light of the definition of VH which refers to the tendency to delay or avoid decisions on vaccination, organizational intervention in vaccination is likely to be perceived as an act that induces the decision without considering any specific reasons that cause VH (e.g., concern for side effects and religious reasons). For those who generally disagree with any intervention by employers, vaccine hesitancy may serve as a catalyst to lead to a more negative evaluation of the legitimacy of vaccine intervention. This study also found that ATV plays an important moderator role in the relationship between VH and the legitimacy of vaccine intervention. When individuals support vaccine mandates, the slope between VH and RV was also steeper in the negative direction. Put otherwise, among those who support vaccine mandates, those with high VH are less likely to believe that organizations have the authority to require their employees to be vaccinated.

Study 2 examined the influence of different types of vaccine policies (i.e., rigidity of policy and procedural justice) on the evaluation of organizations. Regarding the rigidity of policy, the results found that individuals present higher organizational trust for vaccine voluntary policies than vaccine mandates. These results are in keeping with previous observational studies, which also found that vaccine mandates may elicit resistance (Sprengholz et al., 2021). It has been explained by the reactance against rigid interventions in vaccination decisions. Considering penalties are often accompanied by vaccine mandates, the coercive control may lead to distrust in the organization. Consequently, procedural justice affected organizational trust. This relationship between trust in organizations

and procedural justice has long been well established (Alexander & Ruderman, 1987). But, there was no significant interaction effect between policy rigidity and procedural fairness in this study. This finding is contrary to previous studies which have suggested the interaction; when individuals who show a negative attitude to mandatory policies, these types of intervention elicited higher degree of reactance, especially if there was no communication process (Sprengholz et al., 2022). This discrepancy may be partly explained by different manipulations of procedural justice. Of the diverse dimensions of procedural justice (e.g., consistency, transparency, and opportunity to voice), the current study focused on the democratic decision-making process and the opportunity to voice their opinion. It may suggest the necessity of including other aspects of procedural justice in the research.

Theoretical Implications

The current study adds to the growing body of evidence that suggests the importance of considering the perspectives of both individuals and organizations to garner universal acceptance for vaccination. This study may help us understand the impact of individual attitudes and types of policies by reflecting the whole process of evaluation of organizations implementing vaccine policies: in Study 1, from individual attitudes to evaluation of vaccine intervention; in Study 2 from vaccine policies to evaluation of organization. As previous studies have shown, whether vaccination policies at work are a matter of personal choice or social responsibility remains a subject of controversy (Horan & Depetro, 2019; Lantos & Jackson, 2013). These conflicts regarding vaccine interventions in the organization were observed in this study.

Results revealed that vaccine hesitancy, one of the primary indicators of attitudes toward vaccines, compromises the legitimacy of vaccine intervention. Based upon the definition of vaccine hesitancy, which has been stipulated as the reservation of a vaccination decision for a variety of reasons such as concerns about side effects, suspicion of vaccine efficacy, and inconsistent information on vaccines (MacDonald, 2015; Soares et al., 2021), this result may suggest that vaccine interventions can be interpreted as overregulation or reckless intrusion without taking into account the specific causes of vaccine hesitation for those who hesitate to vaccinate. Considering the characteristics of organizational policies, employees may consider not only their health but also various factors such as their reputation in the workplace as well as pressure from superiors and coworkers. In the circumstance in which employees are forced to behave in a certain direction (i.e., vaccinated), the vaccine hesitant would feel more pressure than the non-hesitant under the implementation of vaccine interventions.

What is noteworthy is the moderator role of RG and ATV in the relationship between vaccine hesitancy and the legitimacy of vaccine intervention. Even though it is probable to show opposite patterns to commonsense relationships among variables, this study found that there was not a shift in direction (e.g., positive to negative) but only an effect that intensified or alleviated the slope of the main variables. When those who are unfavorably rating employer intervention show higher vaccine hesitancy, they are more likely to believe that vaccine intervention is not legitimate. A possible explanation for this finding is that the tendency to protect personal autonomy may serve as an amplifier to concern about vaccination and thus result in a more harsh evaluation of vaccination intervention. Even though the vaccine hesitant already judge vaccine intervention as unjustifiable, the willingness to preserve their liberty from intervention would intensify their judgment. One unexpected result was that when those who support vaccine mandates indicate higher vaccine hesitancy, they are less likely to evaluate vaccine intervention as

legitimate. These relationships may be partially explained by two different approaches according to the continuum of vaccine hesitancy. Given that the vaccine hesitant is located in the middle of the acceptors and rejectors spectrum, the reaction to the vaccine intervention may differ depending on the position in this spectrum (Dubé et al., 2013). When positioned as late vaccinators who defer the vaccination because of concern about vaccines, the vaccine interventions may be considered to prompt a decision before directly observing vaccine safety and efficacy. Conversely, for those who are in close proximity to the rejectors, these results may stem from their selfishness. In other words, they are more likely to decide on free rides on herd immunity because vaccines can benefit from immunity not only for the vaccinated but also for the unvaccinated. Another possible explanation of this finding is the difference in the subject of measurement. The question of ATV (e.g., "Vaccination should be mandatory/voluntary") was asked for general opinion regarding vaccine policies, while the items measuring the legitimacy of vaccination intervention (e.g., "I believe that an organization has the right to tell employees to vaccinate") were asked for personal opinion on vaccination intervention.

Further research on perceived organization legitimacy was examined in Study 2 by illuminating the importance of characteristics of policies. Study 2 highlights the importance of the effects of the rigidity of policy (i.e., mandatory vs. voluntary) and procedural justice (i.e., fair vs. unfair) on organizational trust. Given that there were no interactions between rigidity and procedural fairness, it can be inferred that they may be perceived as completely separate realms. Moreover, this study found that even though vaccine policies are perceived as vital issues, both rigidity and procedural justice are still paramount considerations in vaccine policies. In simpler terms, despite novel and uncertain situations like the outbreak of the COVID-19 pandemic, there was no exception to the vaccine policy when evaluating organizations. Meanwhile, there is another possible interpretation of this result. As we enter the third year of the COVID-19 era, the perceived risk of infection has gradually waned. Although we created a hypothetical virus and vaccine policy in this study, it is possible that participants were impacted by real-world situations similar to the hypothetical scenario.

Practical Implications

The current findings have several practical implications. First, individual differences in attitudes (i.e., vaccine hesitancy, attitude toward vaccine policy, legitimacy of intervention) should be considered before implementation of vaccine policy. Given that compliance with vaccine interventions by employers may differ with respect to individual differences, it would be beneficial to identify each employee's attitude toward vaccines as well as the degree of acceptance of organizational intervention by collecting opinions (e.g., employee votes, employee interviews) before establishing a vaccine policy.

Second, these findings also provide important insight into the role of the characteristics of policies in evaluating organizational trust. Depending on the characteristics of the policy, the evaluation of the organization (i.e., organizational trust) may alter, which can also contribute to job satisfaction and organizational efficiency (Isik et al., 2015; Tan & Tan, 2000). Therefore, it is necessary to adopt a procedurally fair and voluntary vaccine policy to fully reflect the opinions of employees and reduce the burden of vaccination. Research in this field has the potential to promote effective vaccine policies and, as a result, improve public health.

Limitations

Despite several important findings, the current study has a few limitations. First, the sample size

in Study 2 was relatively small, with thirty-three participants in each of the four different versions of the survey. Hence, lack of statistical power due to sample size might have contributed to the nonsignificant interaction. But then, as a post hoc power analysis using G*Power version 3.1 (Faul et al., 2007) shows, Study 2 had the power of .06 for the extremely small and nonsignificant effect observed. It is possible that the manipulation materials in Study 2 were too weak to produce an interaction. Furthermore, since the study was conducted with a hypothetical scenario, there remains the possibility that the results would be different when extended to a real-life situation. In addition, because this study only tested the case in Korea, which is generally categorized as a collectivistic culture, the current findings may not generalize to other nations. In a collectivistic culture, group goals are prioritized over individual goals, whereas personal goals are prioritized over group goals in an individualistic culture (Markus & Kitayama, 1991). Specifically, it is possible that individuals in a collectivistic culture, in particular, are more likely to comply with vaccine mandates, and their organizational trust is greater than that of individuals in an individualistic culture. A future study may examine if the current findings could be replicated in other cultures. Lastly, Study 2 did not include variables regarding individual attitudes toward vaccines and interventions (e.g., VH), because Study 2 was mainly designed to examine the influence of policy. Future work needs to integrate these individual differences in order to provide a fuller picture of how individual as well as organizational factors influence responses to health-related interventions. Despite its limitations, the study contributes significantly to our understanding of individual perceptions of comprehensive vaccine policies in the workplace.

FOOTNOTES

[1] It was not our full intention to use a single-item only for measuring this variable, attitudes toward vaccine policies. But because this measurement gave us an insight to better understand how individuals' view on vaccination policy can be related to whether organizations can be justified to regulate employees' vaccination, we decided to keep this variable and report findings with it. Despite the negative reputation of using a single item due to its inability to measure reliability, multiple studies have suggested ways of establishing validation (e.g., face validity, criterion validity, and test-retest validity) of the single-item measurement (Allen et al., 2022). According to Connell et al. (2018), the face validity of a measurement can be established when it meets criteria such as item relevance, ease of response, item unambiguity, not being too sensitive, and non-judgmental. It is unfortunate that our single measure cannot provide reliability information, but the item seems to meet the five criteria to some extent.

[2] For more information, please contact the authors.

[3] To examine the influence of demographics, Analysis of Covariance (ANCOVA) with demographic information as a covariate to control demographics (i.e., sex, age, employment, and current vaccine status). The results showed that sex, $F(1, 127) = 0.47$, $p = .493$, $\eta^2 = .004$; age, $F(1, 127) = 0.01$, $p = .936$, $\eta^2 < .001$; and employment, $F(1, 127) = 1.19$, $p = .278$, $\eta^2 < .01$ were not statistically significant. In terms of current vaccination status, results showed that there is a significant effect of main IVs (i.e., rigidity of policies and procedural justice) on organizational trust after controlling for current vaccine status, $F(1, 127) = 7.17$, $p = .008$, $\eta^2 = .04$. Despite the significance, current vaccine status as a covariate was ruled out for two reasons. Firstly, current vaccination status did not affect the hypothesized relationship between main IVs (i.e., rigidity of policies and procedural justice) and DV (organization trust). Secondly, each cell size of current vaccination status was very unequal so that including the current

vaccination status in the main analyses produced cells with $n = 2$. See Table 5.

The analysis showed that the main effect for current vaccine status is not significant, $F(3, 128) = 0.84$, $p = .477$, $\eta^2 = .02$. The first vaccine only group ($M = 2.75$, $SD = 0.82$) showed lower organizational trust than the booster shot completed ($M = 3.91$, $SD = 1.38$), second vaccine completed ($M = 3.71$, $SD = 1.34$), and no vaccine received ($M = 3.44$, $SD = 1.31$).

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Appendix A
Measurement Items

Vaccine Hesitancy (VH) (M = 2.59, SD = 0.65)

1. Vaccination is important for my health.
2. Vaccines are effective.
3. Being vaccinated is important for the organization and society.
4. All routine vaccinations recommended by the KDCA are beneficial.
5. New vaccines carry more risks than older vaccines.
6. The information I receive about vaccines from the KDCA is reliable and trustworthy.
7. Getting vaccines is a good way to protect me from disease.
8. Generally, I do what my doctor or healthcare provider recommends about vaccines for me.
9. I am concerned about serious adverse effects of vaccines.
10. I do not need vaccines for diseases that are not common anymore.

Legitimacy of intervention for general topic (RG) (M = 2.31, SD = 0.87)

1. I believe that an organization has the right to instruct employees about personal matters other than work.
2. I believe that an organization has the right to be involved in the personal affairs of employees.
3. I believe that an organization can regulate the activities of employees outside the organization.
4. I believe that an organization can limit the activities of employees outside the organization.
5. I believe that an organization has the right to tell employees what to do or not to do outside of the organization.

Legitimacy of intervention for vaccination (RV) (M = 3.22, SD = 0.90)

1. I believe that an organization has the right to tell employees to vaccinate.
2. I believe that an organization has the power to tell employees to vaccinate.
3. I believe that an organization has control over employees' vaccinations.
4. I believe that an organization can regulate employees' vaccinations.

Perceived rigidity scale items (M = 4.44, SD = 1.28)

1. I believe the vaccination policy at S&Y Group is severe.
2. I believe the vaccination policy at S&Y Group is strictly enforced.
3. I believe that employees must follow the vaccination policy at S&Y Group in order to continue working with them.
4. I believe vaccination policy at S&Y Group might have a detrimental effect on employee retention.

Procedural justice scale items (M = 3.89, SD = 1.45)

1. As an employee of S&Y Group, I can express my opinions in the decision-making process.
2. As an employee of S&Y Group, I have the opportunity to participate in decision-making and impact the outcome.
3. The decision-making process at S&Y Group was unbiased.
4. The decision-making process at S&Y Group was based on accurate information.
5. As an S&Y Group employee, I was given the opportunity to participate in the decision-making process.
6. The decision-making process at S&Y Group is guided by ethical and moral principles.

Organizational trust (M = 3.93, SD = 1.31)

1. S&Y Group works diligently to satisfy my opinion.
2. If I got into difficulties at work I know S&Y Group would try and help me out.
3. I believe that S&Y Group can be trusted to make sensible decisions for the organization's future.
4. I believe that S&Y Group always tries to treat me fairly.
5. S&Y Group deceives me for the benefit of the organization.
6. I believe the information that S&Y Group provides me.

Appendix B
Scenarios Used in the Study

Acknowledgements for the success of the vaccination policy

While the world is in chaos as a result of the new virus SOLVER-25, several companies, including S&Y Group, have experienced operating difficulties. Fortunately, a vaccine was developed to prevent infection after a while, and S&Y Group implemented a vaccination policy for its employees. As a consequence, a positive outcome was obtained, which significantly increased the vaccination rate of all employees. By implementing the vaccination policy, S&Y Group was able to prevent its employees from infection and achieve a magnificent 120 % rise in sales through uninterrupted work. We owe a debt of gratitude to our employees.

Mandatory conditions of vaccine policy in the workplace

We at S&Y Group implemented a mandatory vaccine policy for employees on and off the job. This mandatory policy must be obeyed by all employees of S&Y Group. In addition, we will require workers to submit vaccination certificates to verify your vaccination status. Except for people with certain medical conditions, other reasons for exemption do not apply. Those who have not been vaccinated will be limited to using in-house locations such as meeting rooms, bathrooms, and restaurants. Employees who are not vaccinated within the notification period for no obvious reason will be fired.

Voluntary conditions of vaccine policy in the workplace

We at S&Y Group implemented a voluntary vaccine policy for employees on and off the job. Employees of S&Y Group have the option of getting vaccinated or not, depending on their personal preferences. In addition, we will not require any certificates that workers have been vaccinated. Unvaccinated workers will not face any penalties in S&Y Group. Workers are able to choose whether or not to be vaccinated during the notification period, taking into consideration their personal health conditions, among other things. We at S&Y Group give you the freedom to decide whether or not to be vaccinated.

Fair conditions of vaccine policy in the workplace

As a result of last month's all-workers vote, individual worker interviews with team leaders of each department, and operation of the vaccine policy complaint box, the proportion of all workers who favor vaccination was significantly high. Therefore, we have decided to implement a vaccination policy for all employees of S&Y Group. We conducted secret voting to ensure anonymity as well as a complaint box for individuals who disagreed with the policy to actively express their opinions, and placed a high value on fairness in the policy-making process. There was no debate among employees regarding how the policy was created during the process.

Unfair conditions of vaccine policy in the workplace

S&Y Group decided to implement a vaccination policy for all employees without a separate opinion gathering process. Given the gravity of the issue, we have decided to rely on the discretion of a few executives instead of going through the proper process for adopting the policy. By conducting all decision-making procedures in private, S&Y Group did not consider fairness in the policy-making process and did not gather feedback from workers who opposed the policy. We were aware that several employees were dissatisfied with how the policy was adopted, but S&Y Group decided to implement the policy regardless.