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Attitude toward a mandatory COVID-19 vaccination policy and its determinants: Evidence from serial cross-sectional surveys conducted throughout the pandemic in Germany

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ABSTRACT

Background: Mandating vaccination against COVID-19 is often discussed as a means to counter low vaccine uptake. Beyond the potential legal, ethical, and psychological concerns, a successful implementation also needs to consider citizens' support for such a policy. Public attitudes toward vaccination mandates and their determinants might differ over time and, hence, should be monitored.
Methods: Between April 2020 and April 2021, we investigated public support for mandatory vaccination policies in Germany and examined individual correlates, such as vaccination intentions, confidence in vaccine safety, and perceived collective responsibility, using a series of cross-sectional, quota-representative surveys (overall N = 27,509).
Results: Support for a vaccination mandate declined before the approval of the first vaccine against COVID-19 in December 2020 and increased afterwards. However, at the end of April 2021, only half of respondents were in favor of mandatory regulations. In general, mandates were endorsed by those who considered the vaccines to be safe, anticipated practical barriers, and felt responsible for the collective. On the contrary, perceiving vaccination as unnecessary and weighing the benefits and risks of vaccination was related to lower support. Older individuals and males more often endorsed vaccination mandates than did younger participants and females. Interestingly, there was a gap between vaccination intentions and support for mandates, showing that the attitude toward mandatory vaccination was not only determined by vaccination-related factors such as vaccine safety or prosocial considerations.
Conclusions: Because of low public support, mandatory vaccination against COVID-19 should be considered a measure of last resort in Germany. However, if removing barriers to vaccination and educational campaigns about vaccine safety and the societal benefits of high vaccination uptake are not sufficient for increasing vaccination uptake to the required levels, mandates could be introduced. In this case, measures to ensure and increase acceptance and adherence should be taken.
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1. Introduction

Rapid and large-scale uptake of vaccines against COVID-19 is required to control and eventually end the current pandemic. Although people's willingness to get vaccinated increased after the approval of the first vaccines at the end of 2020 [42], vaccine hesitancy still prevents a significant share of the population from getting vaccinated [2]. For instance, survey data from mid-April 2021 show that only 70% of the German and 65% of the US population respectively said they would get vaccinated or had already done so [41]. Previous research indicates that vaccination intentions are lower for people who have little confidence in vaccine

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safety, who are complacent (i.e., consider vaccination as rather unnecessary), who are calculative (i.e., extensively weigh the risks and benefits), who encounter barriers constraining vaccination, and who perceive low collective responsibility (i.e., are less willing to protect others by getting vaccinated) [7].

Various interventions for addressing these antecedents of vaccination have been considered, ranging from information campaigns and nudges to monetary incentives [20,26,28]. When such efforts are not successful [29], mandates are often discussed as a means of countering low vaccine uptake. In many countries, mandates have been implemented for other established vaccine-preventable diseases, such as measles and pertussis. For instance, Germany implemented the Measles Protection Act in March 2020. It requires children, asylum seekers, and staff in healthcare and childcare facilities to be vaccinated against measles twice. Parents who refuse to get their children vaccinated face fines of up to 2500 EUR and a ban from daycare. A study across 29 European countries found mixed effects of mandatory regulations on vaccination uptake, depending on local implementation details such as the acceptance of nonmedical exemptions [40]. However, examples from Italy and France show that the introduction of mandates can successfully increase childhood vaccination rates [14,24]. Mandatory vaccination could also be introduced for the new COVID-19 vaccine, introducing penalties for those who do not comply [19,32]. For instance, the Austrian government announced to make COVID-19 vaccination mandatory, from 1 February 2022 [36], and Greece plans to introduce a monthly fine for unvaccinated citizens above 60 years [21]. However, mandatory vaccination is subject to ethical and legal considerations, such as the right to bodily integrity and autonomy [17,27,31]. Therefore, it is often regarded as a measure of last resort [25,29].

Although vaccination intentions and support for mandatory vaccination are conceptually distinct, it is likely that more positive vaccination intentions would also increase the likelihood to support vaccination mandates. This relationship appears reasonable because there is evidence that people perceive vaccination as a "social contract," that is, vaccinated individuals treat vaccinated others more favorably than unvaccinated others [23]. Hence, vaccinated individuals should be more likely to support vaccination mandates in order to prevent unvaccinated others from violating this social contract. At the same time, experimental evidence indicates that mandating vaccination against COVID-19 can result in psychological reactance, which is a feeling of anger that elicits intentions to avoid mandated and other (still voluntary) vaccinations. Psychological reactance appears to be particularly pronounced among people with low vaccination intentions but can also affect people with high vaccination intentions (to a lower degree; [4]. As a result, when a mandatory policy is not well-accepted by the public, its introduction could hamper national vaccination programs and put public health at risk [38,39]. Thus, monitoring public acceptance of vaccine mandates is key to inform effective vaccination policy making.

Our aim in the present contribution is twofold. Drawing from cross-sectional online surveys conducted between April 2020 and April 2021, we (i) examined the public attitudes of German residents toward a vaccination mandate across the course of the COVID-19 pandemic and (ii) further explored its relation to vaccination intention and psychological variables such as the aforementioned antecedents of vaccination. Regarding the latter objective, we go beyond treating those who support vaccination as also supporting a vaccination mandate. Instead, we investigate when vaccination intentions and the support for mandates converge and when they do not. While recent data from Australia indicates that there is almost no disparity between the two variables [37], this may be different in Germany, where citizens are less accustomed to vaccine mandates. In fact, during the time of the study, the German government emphasized that there will be no mandatory vaccination against COVID-19 [3].

2. Methods

2.1. Participants

We report data from a serial cross-sectional online survey collected at 27 timepoints between April 14, 2020, and April 20, 2021, in Germany [9]. Between 957 and 1379 participants were recruited per timepoint (overall N = 27,509). The samples were nonprobabilistic and quota-representative for age × gender and federal state. The participants were 18–74 years old (M = 45.42, SD = 15.74); 49.7% were male and 50.3% female. Most participants (56.6%) had completed secondary education with university entrance qualifications (for more information on demographic characteristics, see online supplement).

2.2. Materials and measures

After assessing their demographic information, the participants were asked about COVID-19-related risk perceptions and their trust in various institutions. Before approval of the first vaccine by the European Medicines Agency on December 21, 2020, the participants were asked to imagine that there was a vaccine against the coronavirus available and recommended for all age groups. Finally, psychological antecedents of vaccination, vaccination intentions, and support for vaccination mandates were assessed (in this order).

2.2.1. Risk perceptions

Perceived risk was assessed on two dimensions. To measure cognitive risk, we asked: *How susceptible do you consider yourself to an infection of COVID-19?* The participants responded on a scale ranging from 1 (*not at all susceptible*) to 7 (*very susceptible*) [12]). Affective risk was assessed using three questions with 7-point scales [11]; the participants were asked how much they feared COVID-19, how worried they were about it, and how often they thought about it. Responses were mean-averaged (Cronbach's α = 0.81).

2.2.2. Trust

The participants were asked about their trust in various institutions for successfully handling the COVID-19 pandemic. This included the federal government, science, and the media. Furthermore, trust in various health institutions, including the Federal Center for Disease Control (RKI), the Federal Centre for Health Education (BZgA), and federal and state health ministries, was assessed and mean-averaged (Cronbach's α = 0.93).

2.2.3. 5C psychological antecedents of vaccination

An adapted version of the 5C short scale [7] was used to assess confidence (*I am completely confident that the COVID-19 vaccine is safe*), complacency (*Vaccination against COVID-19 is unnecessary because COVID-19 is not common anymore*), constraints (*Everyday stress prevents me from getting vaccinated against COVID-19),* calculation (*When I think about getting vaccinated against COVID-19, I weigh benefits and risks to make the best decision possible*), and collective responsibility (*When everyone is vaccinated against COVID-19, I don't have to get vaccinated, too*). Items were rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The score for collective responsibility was reversed before analyses.

2.2.4. Vaccination intention

Participants were asked what they would do if they had the opportunity to get vaccinated against COVID-19 in the next week. Answers were assessed on 7-point scales ranging from *I would not get vaccinated at all* to *I would definitely get vaccinated* and categorized for some analyses (1–3 = unwilling to vaccinate; 4 = undecided; 5–7 = willing to vaccinate). After the vaccination status of participants was assessed, starting on February 23, 2021, participants who had already been vaccinated against COVID-19 were considered as having maximum vaccination intentions.

2.2.5. Support for mandatory vaccination

Participants were asked whether vaccination against COVID-19 should be mandatory for everyone. Answers were collected using a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and categorized for some analyses (1–3 = not supporting mandate; 4 = undecided; 5–7 = supporting mandate).

3. Results

As shown in Fig. 1, both vaccination intentions and support for a vaccination mandate declined before the approval of the first vaccine by the European Medicine Agency on December 21, 2020, (dashed vertical line) and increased afterward. When Germany was under the first lockdown and no vaccine was in sight on April 14, 2020, about 73% of participants indicated support for a mandatory policy (mean support: M = 5.51, SD = 2.01). After restrictions were lifted on May 4, agreement levels dropped sharply before continuing to decrease more slowly. In the survey conducted on December 15, 2020, right before the approval of the first vaccine, only 36% of participants supported the introduction of a mandate (mean support: M = 3.38, SD = 2.34). A similar picture emerged for the share of participants willing to get vaccinated, dropping from 79% (M = 5.79, SD = 1.80) to 49% (M = 4.20, SD = 2.29) during the same period. With the beginning of the new year, vaccination intentions and the support for mandates increased. On April 20, 2021, 73% of participants were already vaccinated or willing to be so (M = 5.47, SD = 2.17). Public support for vaccination mandates did not recover as strongly as vaccination intentions; at the end of April, 51% of participants supported a mandate (M = 4.19, SD = 2.38).

Two regression analyses were performed to explore the predictors of the support for mandatory vaccination (Table 1). The first regression focused on the time before the approval of the first vaccine, and the second regression examined the time afterwards. In both regressions, the same set of predictors was used: time, age, gender, education, area of residence (Eastern vs. Western Germany), and the 5C. Because the 5C were not collected before May 5, 2020, data from April 2020 were not considered in the first regression. The results reveal that all variables were significant in predicting support for mandatory regulations. Confidence in the safety of COVID-19 vaccines showed the strongest relation, followed by other psychological antecedents. Both before and after approval of the first vaccine, the attitude toward mandates was more positive for participants who considered the vaccines safe, anticipated constraints and felt responsible for the collective. On the contrary, higher complacency and calculation were related to lower support. Demographic predictors played a minor role. Older individuals and males more often endorsed vaccination mandates than younger participants and females did. Although living in Western Germany was associated with stronger support for mandates before approval of the first vaccine, no significant differences between Eastern and Western Germany could be observed afterwards. A similar pattern emerged for education; those who had completed at least 10 years of school indicated lower support for a mandate but only before approval.

As confidence in the safety of vaccines was found to be the key predictor for the attitude toward a vaccination mandate, we explored its relation to risk perceptions and trust in various institutions. A linear regression focusing on the time after the approval of the first vaccines (Table 2) indicated that confidence increased with time and was stronger for older and male individuals and those with higher education that qualifies for university entrance. Higher confidence was further related to more trust in health institutions, the federal government, the media, and, most importantly, science. Stronger cognitive and affective risk perceptions were also associated with higher confidence.

Vaccination intentions and the support for mandates should not be considered interchangeable because after approval of the first vaccines, the slopes developed somewhat differently: the intention to vaccinate increased more steeply than the potential support for a mandate (Fig. 1). In fact, the correlation between both constructs significantly decreased across time, $r_{04/14/2020}$ = 0.78, $r_{12/22/2020}$ = 0.69, $r_{04/20/2021}$ = 0.63. As shown in Fig. 2, after approval of the first vaccine, most of the participants could be clustered into three groups: (A) those unwilling to get vaccinated and not supporting mandates (23% for the period after approval of the first vaccine), (B) those willing to get vaccinated and supporting mandates (40%), and (C) those willing to get vaccinated but not supporting mandates (34%).

A multinomial logistic regression was performed to predict group membership after approval of the first vaccines by using time, age, gender, education, residence, and the 5C as predictors (Table 3). Time, higher age, being male, and living in Western Germany, as well as low levels of complacency, predicted higher vaccination intentions but did not discriminate between individuals supporting versus not supporting vaccination mandates. As indicated by non-overlapping confidence intervals, being confident in vaccine safety, being less calculative, and feeling responsible for the collective increased the chances of being willing to get vaccinated and not supporting a mandate, but even more so to be willing to get vaccinated and supporting a mandate. Furthermore, those anticipating more constraints were more likely to get vaccinated and support a mandate.

4. Discussion

We could show that both vaccination intention and support for mandatory vaccination were lowest before the first vaccines against COVID-19 were introduced. This finding may be explained by previous research indicating that people are more likely to reject new vaccines than established ones [18]. While the share of people willing to be vaccinated increased strongly during the first months of 2021, support for mandatory regulations rose to a smaller extent.

Older people and males were more likely to support a vaccination mandate than younger and female individuals. In older people and males, the COVID-19 case fatality rates are also higher [15,30], which could relate to a greater preference for overarching protection through mandates. Alternatively, the stronger preference in male respondents may be related to a stronger general inclination toward coercive measures. While this was not tested in detail, previous research shows that men are more likely to support pandemic freedom restrictions than women in Germany [6]. Interestingly, participants living in Western Germany indicated stronger support for mandatory regulations in most analyses. Although the current place of residence may differ from participants' origins, internal migration statistics show that large parts of the Eastern population migrated to Western Germany after the

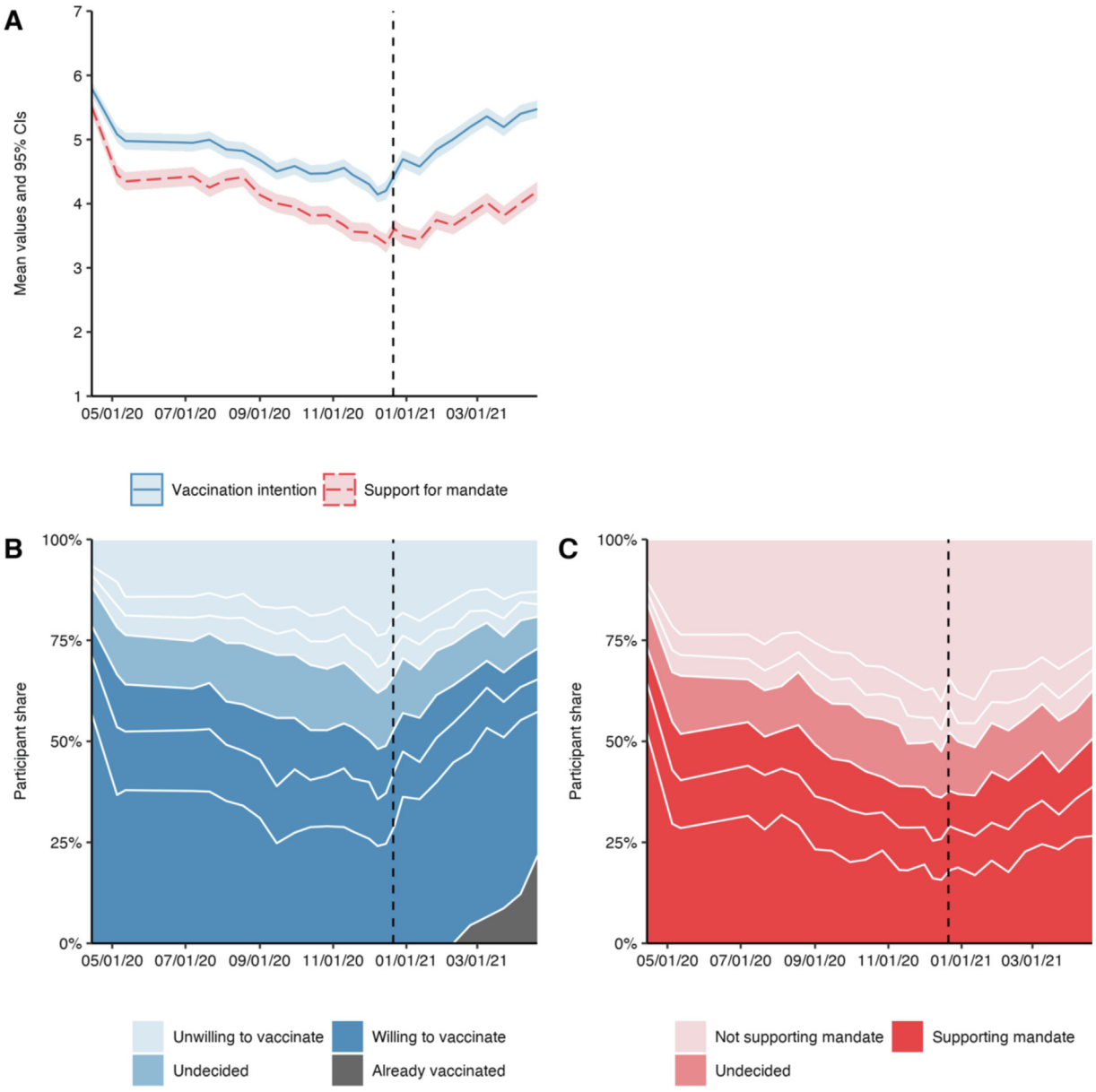

Fig. 1. Vaccination intentions and support for mandates across time. *Note:* Vaccination intentions and support for mandatory regulation were assessed on 7-point scales. Fig. 1A shows the mean values and 95% confidence intervals, while Fig. 1B and 1C visualize the distribution of answers. The dashed vertical line marks the European Medicine Agency's approval of the first vaccine against COVID-19 on December 21, 2020.

reunification of the country but not vice versa [13]. Consequently, large parts of the Eastern sample should be citizens of the former German Democratic Republic (GDR) and, therefore, had experienced mandatory vaccination policies. While these policies led to the quasi-eradication of childhood diseases such as measles and polio [22], the repressive nature of health policies in the GDR may have increased opposition to any kind of mandatory regulation, possibly explaining the lower support for a COVID-19 vaccination mandate in Eastern Germany. However, because other researchers have observed less control aversion toward pandemic measures in Eastern versus Western Germans [34], future work should focus on policy preferences and their antecedents in both regions.

Although demographic characteristics were related to support for a vaccination mandate, psychological variables were stronger predictors. The support especially increased with confidence in vaccine safety, which was linked to trust in the government, health institutions, science, and the media. However, complacency, calculation, and collective responsibility also played a role. Thus, when individuals perceived vaccination against COVID-19 as being necessary, when they did not engage in extensive risk assessments, and when they valued the protection of others, they were more likely to support mandatory regulations. While this result is in line with previous research indicating stronger vaccination intentions given higher scores on these antecedents [7], an interesting result emerged for constraints: the anticipation of barriers toward vaccination, such as everyday stress, is usually related to lower vaccination intentions [7] but was now related to more support for a vaccination mandate. Thus, people may anticipate that vaccination becomes easier or more likely when a mandate is in place, helping them overcome such potential barriers.

The present results show that support for vaccination mandates and vaccination intentions are positively related but certainly not the same. Establishing a positive link between vaccination inten-

Table 1
Predictors of support for mandates before and after approval of the first COVID-19 vaccine.

	Support for mandates before approval of the first vaccine					Support for mandates after approval of the first vaccine				
Predictors	β	*b*	*SE*	*CI–*	*CI+*	β	*b*	*SE*	*CI–*	*CI+*
(Constant)		**1.96**	0.13	1.71	2.21		−0.37	0.21	−0.78	0.05
Time	**−0.09**	**−0.00**	0.00	−0.00	−0.00	**0.06**	**0.00**	0.00	0.00	0.00
Age	**0.04**	**0.01**	0.00	0.00	0.01	**0.09**	**0.01**	0.00	0.01	0.02
Gender: female (baseline: male)	**−0.04**	**−0.20**	0.03	−0.26	−0.15	**−0.04**	**−0.18**	0.04	−0.26	−0.11
Education: 10 + years without university entrance qualification (Baseline: up to 9 years)	**−0.03**	**−0.15**	0.05	−0.25	−0.05	−0.01	−0.07	0.07	−0.20	0.06
Education: 10 + years with university entrance qualification (Baseline: up to 9 years)	**−0.05**	**−0.23**	0.05	−0.32	−0.13	−0.02	−0.08	0.07	−0.21	0.05
Residence: Western Germany (baseline: Eastern Germany)	**−0.01**	**−0.08**	0.04	−0.16	−0.01	0.01	0.04	0.05	−0.06	0.14
Confidence	**0.49**	**0.58**	0.01	0.56	0.59	**0.44**	**0.50**	0.01	0.48	0.52
Complacency	**−0.10**	**−0.13**	0.01	−0.15	−0.11	**−0.04**	**−0.06**	0.02	−0.09	−0.03
Calculation	**−0.11**	**−0.13**	0.01	−0.15	−0.12	**−0.12**	**−0.14**	0.01	−0.16	−0.12
Constraints	**0.05**	**0.07**	0.01	0.05	0.09	**0.08**	**0.12**	0.02	0.09	0.15
Collective Responsibility	**0.13**	**0.17**	0.01	0.15	0.19	**0.16**	**0.20**	0.01	0.17	0.23

Note. Results from linear regression analyses. The first regression includes data collected between May 5 and December 15, 2020 (N = 16,468, R^2 = 0.42, adj. R^2 = 0.42); the second regression refers to data collected between December 22, 2020, and April 20, 2021 (N = 10,009, R^2 = 0.36, adj. R^2 = 0.36). Time denotes the number of days since May 5, 2020. Bold predictors are statistically significant, with $p < .05$. *CI–* and *CI +* being the lower and upper bounds of the 95% confidence interval.

Table 2
Predictors of confidence in vaccine safety after approval of the first vaccines.

	Confidence in vaccine safety				
Predictors	β	*b*	*SE*	*CI–*	*CI+*
(Constant)		**−0.54**	0.12	−0.77	−0.31
Time	**0.11**	**0.01**	0.00	0.00	0.01
Age	**0.14**	**0.02**	0.00	0.02	0.02
Gender: female (baseline: male)	**−0.12**	**−0.48**	0.04	−0.55	−0.41
Education: 10 + years without university entrance qualification (Baseline: up to 9 years)	0.00	0.01	0.06	−0.11	0.14
Education: 10 + years with university entrance qualification (Baseline: up to 9 years)	**0.06**	**0.24**	0.06	0.12	0.36
Residence: Western Germany (baseline: Eastern Germany)	**0.02**	**0.11**	0.05	0.02	0.21
Trust in health institutions	**0.17**	**0.21**	0.02	0.17	0.26
Trust in federal government	**0.11**	**0.12**	0.02	0.08	0.15
Trust in science	**0.22**	**0.27**	0.01	0.24	0.29
Trust in media	**0.09**	**0.12**	0.01	0.09	0.14
Cognitive risk for COVID-19 infection	**0.03**	**0.04**	0.01	0.02	0.07
Affective risk for COVID-19 infection	**0.08**	**0.12**	0.01	0.09	0.15

Note. Results from linear regression analysis, including data collected between December 22, 2020, and April 20, 2021, excluding participants who did not indicate trust in health institutions, federal government, science, and/or media (N = 9,473, R^2 = 0.33, adj. R^2 = 0.33). Time denotes the number of days since December 22, 2020. Bold predictors are statistically significant, with $p < .05$. *CI–* and *CI +* being the lower and upper bounds of the 95% confidence interval.

tions and support for vaccination mandates is in line with the perspective that vaccination is perceived as a social contract [23]. Hence, people with positive vaccination intentions are more likely to support vaccination mandates to avoid others' violation of this social contract. Yet, the majority, but not all of those who wanted to be vaccinated against COVID-19, also endorsed a mandate. This suggests that there are two groups of reasons for not supporting vaccination mandates: factors related to specific vaccinations and ethical considerations. As shown in the current study, when people perceive vaccination as safe and necessary and feel a social obligation for vaccination, their vaccination intentions increase. However, stronger intentions may only translate into more support for mandates when mandatory regulations are in line with individual ethical perspectives. Although we did not assess participants' moral values, previous research indicates that libertarian morality (i.e., valuing individual freedom) can indeed decrease support for mandatory vaccination [1,39].

The interpretation and generalization of the findings has several limitations. While the samples were quota-representative for age × gender and federal state, they differed from the general population on other criteria. For instance, the share of individuals with secondary education was higher among respondents than in the German population and people with migration background were underrepresented [16]. Thus, results should be generalized with caution. Furthermore, results from other countries may differ depending on local disease dynamics, cultural background, and the history of vaccination mandates in a country. When incidence rates are high or people are used to mandatory regulations, the support for mandates may be stronger. For instance, Smith and colleagues (2021) showed that there is virtually no gap between COVID-19 vaccination intentions and support for mandatory regulations in Australia. In their study, 93% of those willing to get vaccinated also preferred a mandate, while 6% were not sure and only 1% opposed such a regulation; this may be because Australian citizens are accustomed to vaccination mandates for childhood immunizations. In Germany, there are no vaccination mandates but for children and professionals in kindergartens, schools, and refugee camps. The reasons for opposing mandates may differ between countries as well. While societies emphasizing individual freedom may refuse mandatory vaccination, more collective populations could endorse vaccination for prosocial reasons and support the introduction of a mandate [10]. We need to further highlight that support for a mandate can increase when the reasons for its introduction are explained to the public. Previous research sug-

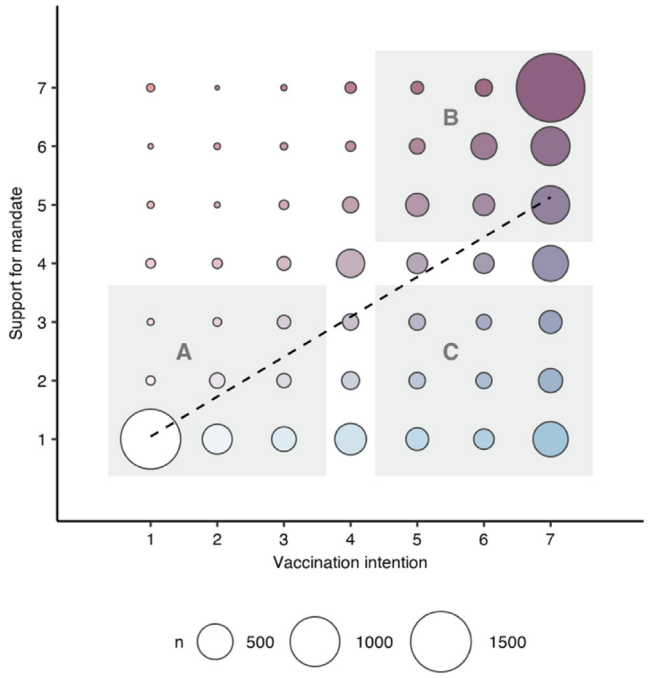

Fig. 2. Relationship between vaccination intention and support for mandatory vaccination. *Note:* The figure shows data collected after the approval of first vaccine against COVID-19 between December 22, 2020, and April 20, 2021 (N = 10,009). The dashed line visualizes the results of a linear regression of mandate support on vaccination intention (R^2 = 0.42). Most of the participants could be clustered into three groups: (A) those unwilling to get vaccinated and not supporting mandates (23%), (B) those willing to get vaccinated and supporting mandates (40%), and (C) those willing to get vaccinated but not supporting mandates (34%).

gests that educating people about the prosocial benefits of individual vaccinations (herd immunity) can reduce potential anger about a mandate [39]. Importantly, our study was conducted during a time when the government emphasized that there will be no mandatory vaccination against COVID-19. But as voluntary vaccination turned out to be insufficient to control the spread of the virus and end the pandemic, many politicians but also scientists changed their opinion in late 2021 and argued in favor of a vaccination mandate [8]. While we could not assess the impact of this reconsideration, it may have increased public support for a mandate.

Scholars agree that mandatory regulations should be considered as a last resort to increase vaccination uptake after careful ethical, medical, epidemiological, and social considerations [25,29,33]. Because the current study and previous research indicate that confidence in the new vaccines and other psychological variables such as complacency and collective responsibility are important antecedents of vaccination [7], they should be addressed in communication interventions. When people learn about the safety and efficacy of vaccines and understand that their immunization can prevent the severe consequences of COVID-19 infections for vulnerable individuals, vaccination intentions should increase [5]—as potentially observed after the approval of the first vaccine (Fig. 1). Furthermore, reducing the barriers toward vaccination by simplifying access or implementing opt-out vaccination appointments could help to translate vaccination intentions into higher uptake rates [35]. However, if less coercive measures are not effective enough, mandates may be introduced. When this is the case, communication measures to complement the mandate are key. First, it is of great importance to listen to doubts regarding the safety of the vaccine and to debunk misinformation. Trust in the safety is a key factor for the acceptance of the measure. People who do not trust in the safety will react with greater reactance (anger) and potential countermeasures (e.g., demonstrations, no mask wearing etc.) following the introduction of the mandate [39]. Second, we suggest explaining the rationale behind the measure to citizens and examining and addressing ethical objections to increase both support and adherence to the regulation. Though it requires extensive work to design educational measures with strong outreach, they could help people who support vaccinations to understand the reasoning behind a vaccination mandate (e.g., increasing collective efforts to eliminate the disease), potentially decreasing psychological reactance and fostering support for mandatory regulations [39].

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Table 3
Predictors of group membership.

	Willing to vaccinate but not supporting mandate			Willing to vaccinate and supporting mandate			
Predictors	*OR*	*CI–*	*CI+*	*OR*	*CI–*	*CI+*	Δ
(Constant)	**0.00**	0.00	0.01	**0.00**	0.00	0.00	–
Time	**1.01**	1.01	1.01	**1.01**	1.01	1.01	+
Age	**1.02**	1.01	1.02	**1.03**	1.03	1.04	+
Gender: female (baseline: male)	**0.76**	0.63	0.91	**0.66**	0.55	0.79	–
Education: 10+ years without university entrance qualification (Baseline: up to 9 years)	**1.48**	1.05	2.08	1.23	0.90	1.69	
Education: 10+ years with university entrance qualification (Baseline: up to 9 years)	**1.95**	1.40	2.72	**1.60**	1.18	2.18	
Residence: Western Germany (baseline: Eastern Germany)	**1.71**	1.33	2.21	**1.46**	1.15	1.85	
Confidence	**2.75**	2.58	2.92	**3.37**	3.17	3.59	+
Complacency	**0.74**	0.68	0.79	**0.80**	0.75	0.86	+
Calculation	**0.86**	0.82	0.91	**0.77**	0.73	0.80	–
Constraints	0.98	0.91	1.06	**1.15**	1.07	1.23	+
Collective Responsibility	**1.44**	1.35	1.53	**1.64**	1.54	1.75	+

Note. Results from multinomial logistic regression (reference group: individuals unwilling to vaccinate and not supporting a mandate), including data collected between December 22, 2020, and April 20, 2021 (excluding participants who were undecided about vaccination or mandates or indicated support for mandates but not intention to get vaccinated, N = 7847, Cox' & Snell's R^2 = 0.55, Nagelkerke's R^2 = 0.63). Time denotes the number of days since December 22, 2020. Bold predictors are statistically significant, with $p < .05$. *CI–* and *CI +* being the lower and upper bounds of the 95% confidence interval. Δ indicates differences in predictors for both outcomes, with + (–) referring to significantly more positive (negative) predictors for those supporting mandates compared with those opposing them but being willing to get vaccinated.

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CRediT authorship contribution statement

Philipp Sprengholz: Conceptualization, Methodology, Investigation, Formal analysis, Visualization, Writing – original draft. **Lars Korn:** Conceptualization, Methodology, Writing – review & editing. **Sarah Eitze:** Conceptualization, Methodology, Writing – review & editing. **Lisa Felgendreff:** Conceptualization, Methodology, Writing – review & editing. **Regina Siegers:** Conceptualization, Methodology, Writing – review & editing. **Laura Goldhahn:** Conceptualization, Methodology, Writing – review & editing. **Freia De Bock:** Conceptualization, Writing – review & editing. **Lena Huebl:** Conceptualization, Writing – review & editing. **Robert Böhm:** Conceptualization, Methodology, Writing – review & editing, Supervision. **Cornelia Betsch:** Conceptualization, Methodology, Writing – review & editing, Supervision, Funding acquisition.

Data availability statement

Data and the data analysis script are available at https://dx.doi.org/10.17605/OSF.IO/PE3RD.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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