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From delta to omicron: The role of individual factors and social context in self-reported compliance with pandemic regulations and recommendations

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ABSTRACT

As SARS-CoV-2 spreads especially when larger groups gather (e.g., at the workplace), it is crucial to understand compliance with regulations and recommendations in such settings. Using data from adults in Germany (N = 29,355) assessed between October 2021 and February 2022, we investigated factors associated with self-reported compliance in both private and working life and how these relate to each other. The results indicate that private compliance was stronger among older individuals and females; among those who worried more about the pandemic situation and assumed that infection was more severe; among those who trusted the government more; and among those who did not perceive public health measures as exaggerated. Private compliance was also associated with personality traits; in particular, individuals who followed regulations and recommendations were likely to be more introverted, conscientious, open, and agreeable. Compliance at work related to both private compliance and colleagues' behaviors. Individuals whose private compliance was high also complied at work. However, when private compliance was low, compliance at work aligned with colleagues' behaviors; that is, compliance at work was high when colleagues complied and low when they did not. The observed effects were stable over time. In summary, they suggest that compliance with regulations and recommendations depends on individual risk perception, trust in government, perception of required or recommended measures, and social norms. To promote protective behaviors in contexts where larger groups gather (including workplaces), making positive social norms more salient (e.g., by supporting role models) may prove especially useful.

1. Introduction

Beyond vaccination, non-pharmaceutical interventions (NPIs) to reduce contacts can help to prevent infection with SARS-CoV-2. In mitigating the COVID-19 pandemic, school closures, banning of public events, and mask mandates have been shown to reduce virus transmission (Mendez-Brito et al., 2021), and most governments and private companies introduced regulations and recommendations for private and work-related contacts (Ritchie et al., 2022). For instance, between April 2020 and April 2022, German residents were obliged to wear face masks when shopping or using public transport, and everyone was recommended to wash their hands frequently and to keep rooms ventilated. During the same period, in the workplace, wearing a mask was mandatory for employees who could not maintain a distance of at least 1.5 m from others (Bundesministerium für Arbeit und Soziales, 2022).

While regulations and recommendations are important for guiding individual behavior, actual compliance also depends on multiple other factors. First, psychological theories such as the Health Belief Model (Becker, 1974), the Protection Motivation Theory (Brugger et al., 2018), and the Health Action Process Approach (Rogers, 1975) posit that health behaviors are influenced by perceptions of risk, including deliberative appraisal of the probability and severity of specific behavioral outcomes (e.g., infection with SARS-CoV-2) and affective perceptions such as feeling worried or helpless regarding a specific risk (Ferrer and Klein, 2015). Accordingly, protective behaviors such as mask wearing and avoiding social gatherings were associated with stronger cognitive and affective perceptions of risk during the first year of the COVID-19 pandemic in Germany (Korn et al., 2021). Second, protective

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behaviors are more likely when perceived as feasible and practicable (Jørgensen et al., 2021) and when individuals trust the recommending body (Wright et al., 2021). Third, previous research suggests that personality relates to differences in preventive behaviors. For instance, higher levels of agreeableness and conscientiousness were found to relate to more preventive behaviors, possibly because individuals with such traits prioritize the protection of others for prosocial reasons or because they valorize compliance itself (Aschwanden et al., 2021; Blagov, 2021; Zettler et al., 2022). Finally, social factors influence protective behaviors (Neville et al., 2021). According to Social Norms Theory (Perkins and Berkowitz, 1986), peer influences and normative beliefs shape individual behavior. Thus, people may engage in protective behaviors not because they expect to benefit from the behavior itself but in order to preserve their social reputation. As such, social norms are likely to be especially important when people gather in larger groups that make transmission of infectious pathogens more likely. In the workplace, for example, employees should be more likely to follow regulations and recommendations when their colleagues do so too. What happens, then, if group norms and private behaviors conflict? Kittel et al. (2021) reported that the influence of social norms on protective behaviors increased as perceived risk decreased. On that basis, colleagues' protective behaviors can be expected to influence compliance with regulations and recommendations when private compliance is low. Conversely, non-compliant colleagues may have little influence on individual protective behaviors when private compliance is high. These assumptions are in line with health-psychological theories such as the Health Belief Model (Janz and Becker, 1984) in which individual behavior depends not only on risk perceptions but also cues to action. Therefore, compliance with pandemic regulations and recommendations can be high in work contexts even when individual risk perceptions (and private compliance) are low as long as the majority of colleagues adheres to current measures, thereby providing a cue to action by setting a standard of high compliance for all employees.

To explore the relationship between risk perception, trust, social norms, and compliance with protective regulations and recommendations in private and work contexts, we analyzed data from a large German sample collected during two pandemic waves between late 2021 (when the dominant strain of SARS-CoV-2 was the B.1.617.2/Delta variant) and early 2022 (when the dominant strain was the B.1.1.529/Omicron variant). This period is of interest because it enables us to compare behavioral responses as the virus mutated and infection risks changed. While Omicron was considered less severe than Delta in terms of risk of hospitalization and death, it was also more contagious (Dyer, 2021), and thus we could explore whether and how these changes are related to risk perception and behavior and whether certain social norms became more or less important in guiding individual behavior. Importantly, pandemic regulations and recommendations barely changed during the two waves. For instance, the aforementioned mask mandates, handwashing and airing recommendations were in place during the observation period. This stability is also reflected by negligible changes of the Oxford COVID-19 Government Response Stringency Index for Germany between November 2021 and February 2022 (Hale et al., 2021). We further investigated correlates of private compliance and examined potential interactions between private compliance and colleagues' behavior (i.e., social norms) on compliance in workplace settings. By clarifying the influence of social norms on protective behaviors, our findings can help decision-makers to develop effective strategies for increasing adherence to health-related regulations and recommendations in private and workplace contexts.

2. Methods

In April 2020, the Robert Koch Institute (Germany's center for disease control) released the Corona Data Donation (Corona-Datenspende, https://corona-datenspende.de) smartphone application, which allows users to submit basic vital data (e.g., resting heart rate, physical activity, sleep patterns) measured with fitness trackers and smartwatches. The app can be used by German residents above 16 years and was updated in mid-October 2021 to incorporate survey modules capturing, among others, users' feelings, attitudes, and behaviors during the pandemic. As of March 2022, the app had more than 185,000 monthly active users that submitted vital data, approximately 38,000 of which also participated in at least one of the survey modules. Users participate in a self-recruited manner and are made aware of the app mostly through public announcements, a dedicated scientific blog, and social media outreach. The large sample size and high measurement frequency of the data allows continuous tracking of attitudes and behaviors with respect to pandemic response, thereby enabling a fine-grained analysis of potential changes due to, for instance, the emergence of novel virus variants of concern, or specific policy measures.

The content of the module discussed here is based on items from the COVID-19 Snapshot Monitoring (COSMO), a large serial cross-sectional survey (Betsch et al., 2022). When a new user enrolls in the Corona Data Donation, a baseline questionnaire records demographic information and personality traits. Subsequent weekly and monthly questionnaires capture different sets of variables (Wiedermann et al., 2022). Most of the data used in the present study were collected in the monthly questionnaires. As participants could answer the questionnaires at any time during the given week or month, data were registered continuously rather than for specific days. Participation was voluntary and unpaid and all participants provided informed consent for the anonymized use and sharing of their data for scientific purposes.

2.1. Participants

Between October 21, 2021, and February 28, 2022, $N = 29{,}355$ participants completed at least one of the weekly or monthly questionnaires. In total, they answered 72,606 monthly questionnaires ($M = 2.74$, $SD = 1.41$) and 235,754 weekly questionnaires ($M = 8.62$, $SD = 5.93$). The large dataset provided sufficient power to detect small effects in the conducted analyses. Overall, the sample was younger (76% born between 1960 and 1990) and included fewer females (64% male) than the general German population; for further information, see the online supplement.

2.2. Baseline questionnaire measures

Questions in the baseline questionnaire included the following and were assessed only once.

Demographic information. Participants were asked about their gender (male or female) and their birth cohort (five-year increments from 1930 onward).

Big Five. The personality traits extraversion, neuroticism, conscientiousness, openness, and agreeableness were assessed using the 5-point items developed by Rammstedt et al. (2004); for example, in relation to extraversion: *Please assess yourself: I am (1) extrovert (talkative, sociable, full of energy, outgoing) … (5) introvert (quiet, taciturn, withdrawn, rather a loner)*. Scores were recoded to align with the direction indicated by each trait.

2.3. Weekly questionnaire measures

Trust in federal government. Participants were asked how much they trusted the federal government to handle the coronavirus appropriately. Answers were recorded on a 5-point scale ranging from *not at all* to *completely*.

Perception of policies. Participants were asked how much they agreed with the statement *I think the measures currently being taken to combat the pandemic are greatly exaggerated*. Answers were recorded on a 5-point scale ranging from *not at all* to *very much*.

2.4. Monthly questionnaire measures

Risk perception. Three items were used to measure different dimensions of risk perception. Participants were asked to assess their own chances of infection by COVID-19 (on a 5-point scale from *extremely unlikely* to *extremely likely*) and how severe they would expect that infection to be (on a 5-point scale from *completely harmless* to *extremely dangerous*). To further assess affective risk perception, participants were asked to rate the ongoing pandemic on a 5-point scale from *not worrisome* to *worrisome* (Bradley and Lang, 1994).

Compliance with pandemic regulations and recommendations. Participants were asked: *During the past week, how closely did you comply with pandemic regulations and recommendations in private?* And … *at work?* Answers to both items were recorded on a 5-point scale from *not at all* to *very much*. Participants were also asked to rate their work colleagues' compliance on the same scale. The work-related questions were only asked when participants worked at least partly outside their own home.

2.5. Ethics and consent

Ethical clearance for the study was obtained from the University of Erfurt's IRB (#20220414), and all participants provided informed consent prior to data collection.

3. Results

3.1. Changes over time in risk perception, trust, and compliance

Fig. 1 shows how risk perception, trust, and compliance changed over time, and Table 1 reports how daily averages for these variables correlated with the number of new infections (7-day average) during the Delta and Omicron waves. In both periods, variations in self-assessed probability of infection are closely linked to the number of new infections (Fig. 1A). While perceived severity was relatively stable and decreased only slightly during the Omicron wave, affective risk increased with infection numbers during the Delta wave but decreased when Omicron became dominant in 2022. This visible trend is corroborated by a negative correlation between cases and affective risk perception during the respective period (Table 1).

Trust in the federal government (Fig. 1B) was negatively correlated with the number of new infections. It decreased when infections increased during the Delta period and recovered when case numbers fell. Notably, the turning point coincided with the change of German federal government on December 8, 2021, when trust increased considerably (Betsch et al., 2022). When infections rose in November 2021, pandemic measures were perceived as less exaggerated, but the change was small, and perceptions returned to previous levels at the end of the year. Importantly, during the Omicron wave that followed, people reported an increasing feeling that measures were exaggerated despite the sharply rising case numbers.

As shown in Fig. 1C, reported compliance with regulations and recommendations was high and relatively stable over time. Overall, individuals rated work colleagues' compliance ($M = 4.13$, $SD = 0.85$) as slightly lower than their own at work ($M = 4.48$, $SD = 0.68$, Welch's t (115,249) $= -78.09$, $p < .001$, $d = 0.45$), and in private ($M = 4.37$, $SD = 0.72$, Welch's t (118,850) $= -53.63$, $p < .001$, $d = 0.22$).

3.2. Correlates of private compliance

To investigate correlates of compliance with pandemic regulations and recommendations, we performed a linear mixed effects regression, controlling for participation in multiple questionnaires (modelled as a random intercept). Predictors included risk perception (based on monthly questionnaires), baseline information (birth cohort, gender, and Big Five personality variables), and information from individual weekly questionnaires closest to each individual monthly questionnaire

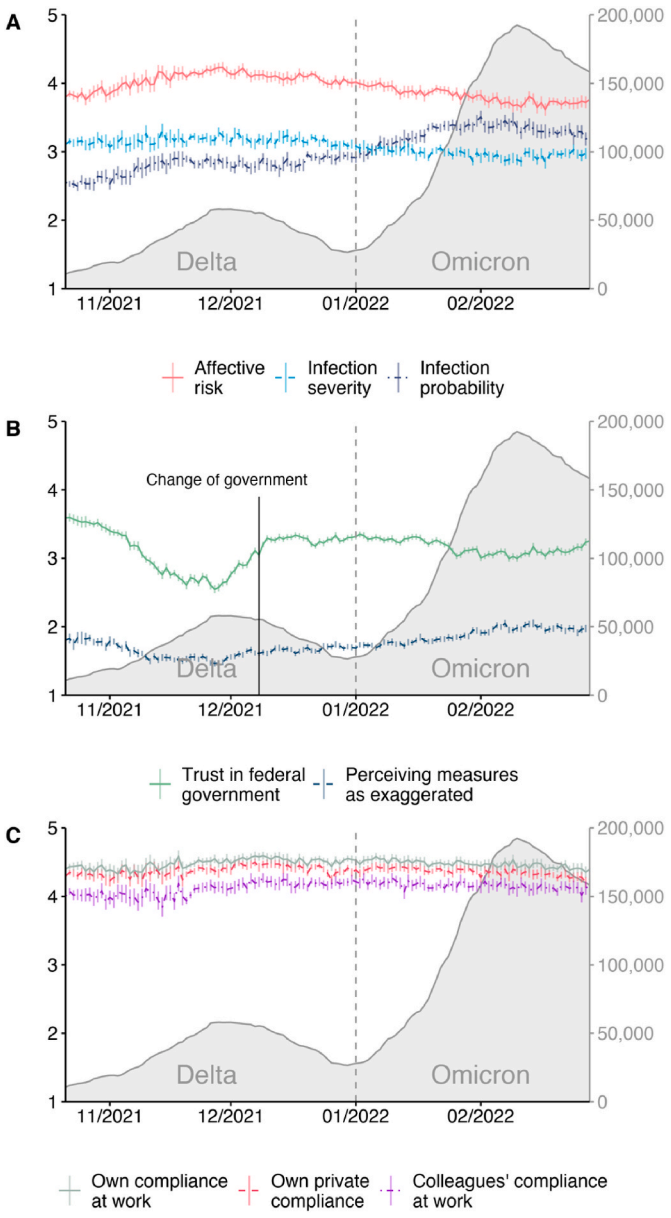

Fig. 1. Changes over time in risk perception, trust, and compliance with NPIs. *Note:* Data collected between October 21, 2021, and February 28, 2022, show that perceived infection probability (A) and trust in federal government (B) relate to the number of new infections (7-day average, grey area, right-hand scale) during the Delta and Omicron waves (variant change indicated by vertical dashed line). Other variables including severity, affective risk perception, and compliance (C) align with new infections in 2021 (Delta wave) but decrease in 2022 (Omicron wave). All variables were measured on 5-point scales; translucent vertical bars indicate 95% confidence intervals.

(if available and completed up to seven days before or after the monthly questionnaire, as this was not the case for 21% of the monthly questionnaires, these were dropped from the analysis). As shown in Table 2, all predictors other than neuroticism were statistically significant, although the effects were small. Private compliance with regulations and recommendations was higher among older and female participants. It was also related to specific personality traits; specifically, compliance was higher among individuals who are more introverted, conscientious, open, and agreeable. While greater affective risk and perceived severity were associated with greater compliance, higher perceived probability of infection was associated with lower compliance. Trust in federal government was positively related to compliance, and compliance was

Table 1
Correlations between survey variables and daily new infections.

	Delta period 21/10–31/12/2021			Omicron period 01/01–28/02/2022		
	r	CI–	CI+	r	CI–	CI+
Infection probability	.61	.45	.74	.74	.59	.84
Infection severity	.46	.25	.62	−.70	−.81	−.54
Affective risk	.89	.82	.93	−.90	−.94	−.84
Trust in federal government	−.72	−.82	−.59	−.87	−.92	−.79
Perceived exaggeration of measures	−.73	−.83	−.61	.96	.93	.97
Own private compliance	.66	.50	.77	−.61	−.75	−.43
Own compliance at work	.68	.53	.79	−.67	−.79	−.49
Colleagues' compliance at work	.50	.31	.66	−.52	−.69	−.31

Note: Correlations are based on daily averages of survey variables and new infections from the last 7 days. All correlations differ significantly from zero ($p < .001$). With the exception of infection probability and trust in federal government, observed correlations during the Delta wave reversed during the Omicron wave. *CI–* and *CI +* refer to the lower and upper bounds of the 95% confidence interval.

Table 2
Correlates of private compliance.

Predictor	β	*b*	*SE*	*CI–*	*CI+*
(Constant)		16.92	0.62	15.72	18.13
Demographics					
Birth cohort	−0.12	−0.01	0.00	−0.01	−0.01
Gender: male (baseline: female)	−0.12	−0.09	0.01	−0.10	−0.07
Big Five					
Extraversion	−0.06	−0.04	0.00	−0.05	−0.03
Neuroticism	−0.00	−0.00	0.00	−0.01	0.01
Conscientiousness	0.09	0.07	0.00	0.07	0.08
Openness	0.05	0.04	0.00	0.03	0.05
Agreeableness	0.02	0.02	0.00	0.01	0.03
Risk perception					
Infection probability	−0.02	−0.01	0.00	−0.02	−0.01
Infection severity	0.04	0.03	0.00	0.02	0.04
Affective risk	0.13	0.11	0.00	0.10	0.11
Trust and support					
Trust in federal government	0.04	0.03	0.00	0.02	0.03
Perceiving measures as exaggerated	−0.12	−0.09	0.00	−0.09	−0.08

Note: Fixed effects from a linear mixed effects regression controlling for multiple participation modelled as a random intercept ($n = 57{,}691$ observations of $N = 22{,}308$ participants, $\sigma^2 = 0.25$, $ICC = 0.43$, marginal $R^2 = 0.10$, conditional $R^2 = 0.49$, using total SD of coefficients for standardization). β denotes standardized, *b* unstandardized regression coefficients. All predictors other than neuroticism were significant with $p < .001$. *CI–* and *CI +* refer to lower and upper bounds of the 95% confidence interval.

also greater among those who did not perceive pandemic measures as exaggerated. Based on Table 2, the strongest predictors of private compliance are age, stronger affective risk perception, and perceiving pandemic measures as not exaggerated. There was no qualitative change when results were analyzed separately for the Delta and Omicron waves (see online supplement).

3.3. Compliance at work

Assuming that compliance with pandemic regulations and recommendations at work is likely to be influenced both by private compliance and the perceived compliance of colleagues, we performed another mixed effects regression, again controlling for multiple participation. We regressed own compliance at work on main and interaction effects of own compliance in private and colleagues' compliance at work ($n = 60{,}374$ observations of $N = 22{,}575$ participants, $\sigma^2 = 0.19$, $ICC = 0.30$, marginal $R^2 = 0.38$, conditional $R^2 = 0.57$). All effects were statistically significant; own compliance at work was higher among participants who reported stronger private compliance (β = 0.30, $b = 0.77$, $SE = 0.01$, *95% CI* = [0.75; 0.79]) and indicated that colleagues complied (β = 0.39, $b = 0.83$, $SE = 0.01$, *95% CI* = [0.81; 0.86]). Fig. 2 shows a significant interaction effect (β = −0.11, $b = -0.12$, $SE = 0.00$, *95% CI* = [−0.13; −0.12]); when own private compliance was high, participants also complied at work. However, when private compliance was low, compliance at work aligned strongly with colleagues' behavior. In this case, compliance was high when colleagues complied and low when they did not comply. Importantly, there was no qualitative change in these effects when the Delta and Omicron waves were analyzed separately or when the Christmas holiday period was excluded (see online supplement).

4. Discussion

About two years after the first SARS-CoV-2 infections were reported, we investigated risk perception, trust, and compliance with pandemic regulations and recommendations during two pandemic waves caused by the B.1.617.2 variant (Delta; late 2021) and by the B.1.1.529 variant (Omicron; early 2022). During both periods, perceived infection probability was linked to infection numbers. Following the emergence of Omicron at the end of 2021, participants likely assumed that the sharp increase in case numbers escalated their likelihood of being infected. However, perceived severity and affective risk perception only increased with the rise in infections during the Delta wave and subsequently decreased during the Omicron wave. Despite unprecedented case numbers in early 2022, worries about SARS-CoV-2 declined, possibly because media reports framed Omicron as more infectious but less

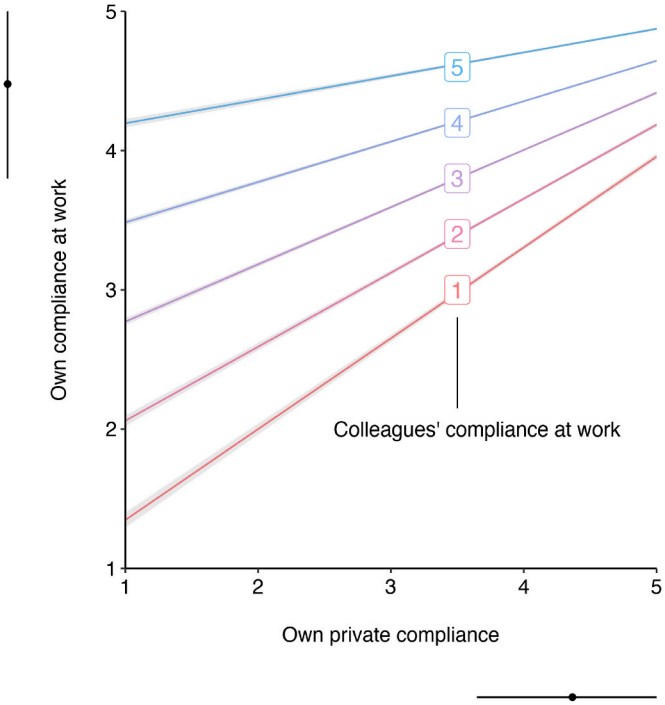

Fig. 2. Compliance with pandemic regulations and recommendations. *Note:* Results from a mixed effects regression with own private compliance and colleagues' compliance at work, as well as their interaction predicting own compliance at work (controlling for multiple participation). All variables were measured on scales ranging from 1 (*not at all*) to 5 (*very much*). All main and interaction effects were significant with $p < .001$, with no considerable variation between Delta and Omicron waves (see online supplement). Grey ribbons represent 95% confidence intervals. Results remained qualitatively unchanged when controlling for demographic variables, risk perceptions, trust, and the big five (adding the same predictors shown in Table 2). Dots and whiskers denote variable means and standard deviations.

severe than Delta (Dyer, 2021). While trust in the federal government declined sharply when infections rose during the Delta wave, this was not the case in the Omicron wave that followed. While this may also relate to a reduction in perceived risk, these results must be viewed with caution, as the change of government and factors unrelated to the pandemic may have impacted trust.

It is interesting that self-reported compliance with pandemic regulations and recommendations was quite stable over time. This suggests a ceiling effect caused by a selection bias in our sample; as many or most of the survey respondents may have participated to improve the government response to the pandemic, they may be more compliant than the general population. This could also explain the higher ratings of own compliance as compared to colleagues.

Participants who perceived infection probability as high tended to exhibit a little less compliance, possibly because they assumed that infection with SARS-CoV-2 was inevitable. Extroverted people were also less likely to be compliant; as they described themselves as more outgoing and sociable, they may have violated regulations by engaging in higher levels of social contact. While some recent studies have reported similar negative links between extraversion and protective behavior (Blagov, 2021; Carvalho et al., 2020; Chan et al., 2021), others found a positive relationship (Aschwanden et al., 2021; Rammstedt et al., 2022; Zettler et al., 2022). This conflicting evidence warrants further investigation to identify potential moderators of the relationship between extraversion and compliance. In line with previous research (Aschwanden et al., 2021; Blagov, 2021; Zettler et al., 2022), more agreeable or conscientious individuals exhibited greater compliance, possibly because they are more likely to prioritize the protection of others or because they valorize compliance itself. Our results also indicate that compliance is associated with higher levels of openness. This aligns with other research (Aschwanden et al., 2021; Clark et al., 2020; Zettler et al., 2022), open-minded individuals may be more likely to accept (reasonable) restrictions. In line with previous research, we found that trust in the federal government's ability to handle the pandemic relates to increased compliance, as did the perception that protective measures are not exaggerated (Korn et al., 2021; Wright et al., 2021). While not investigated here, the identified predictors of private compliance may interact with each other. For instance, previous research suggests that trust moderates the effect of threat perceptions on protective behaviors (Jørgensen et al., 2021). Furthermore, there may be confounding variables influencing compliance and its predictors. For example, political partisanship may influence risk patterns, trust, social norms, and adherence to pandemic measures. Future research should have a closer look at such confounders.

The data on work-related compliance suggest that social norms influence the individual behavior. Low private compliance was linked to low compliance at work only if colleagues were also non-compliant; when colleagues were perceived as adhering to regulations and recommendations, respondents did so too. Importantly, participants who claimed to be compliant in private were also compliant at work, even if colleagues were not. As the observed effects were stable over time and did not change during the Omicron wave, it seems that social norms sustain protective behaviors when perceived severity and affective risk decrease. Alternatively, it can be argued that protective behaviors become a matter of routine when practiced over time (Rebar et al., 2021) and do not change quickly. While we cannot entirely rule this out, colleagues' behavior seems to carry significant weight, indicating that social norms play an important role in guiding individual behavior. Consequently, companies should seek to establish conditions that facilitate the development of social norms—for instance, by incentivizing role models or issuing written warnings to anyone who violates agreed norms (Balliet et al., 2011). Conversely, employees who comply with recommendations and engage in protective behaviors can set a standard for others, linking non-compliance to loss of reputation (Bottemanne and Friston, 2021; Teraji, 2013). This could prevent the transfer of private noncompliance to the workplace, which is important as larger group contexts are potential super-spreader locations.

The present study has some limitations. First, the data were collected via the *Datenspende* app and most of the users were less than 60 years old; thus, the sample cannot be considered representative of the German population as a whole. Additionally, as the app was rolled out by a government agency, people who deny the existence or severity of SARS-CoV-2 and those who do not trust the government are probably underrepresented; indeed, more than 99% of the sample reported being vaccinated against COVID-19. However, while our sample differs from the general public, qualitative changes of some variables including risk perceptions and trust resembled those observed in more representative studies such as the COSMO project (Betsch et al., 2022), a series of cross-sectional quota-representative surveys (for a comparison, see the online supplement). A second limitation of the present study is that it does not support causal interpretation, as all of the analyses were correlational. For instance, we cannot conclude that private compliance is transferred to the workplace, as the relationship may also work in the other direction or may even be bidirectional. Future research should therefore investigate the relationship between own and colleague compliance in experimental studies. Third, all of the variables were self-reported and may differ from actual behavior. For instance, some participants may have exaggerated their compliance for reasons of social desirability or the *better than average effect*, as own compliance with workplace regulations was rated higher than that of colleagues (Zell et al., 2020). Unfortunately, additional variables for examining the accuracy of compliance ratings such as the frequency of informing oneself about current regulations were not assessed in the Corona Data Donation app. Fourth, the results refer to a specific time and context and may change as the pandemic progresses. As in the observed differences between the Delta and Omicron periods, attitudes and behaviors may change with the emergence of new virus variants. Furthermore, people's risk perceptions and protective behaviors may decline when the disease becomes endemic. Therefore, continued monitoring of psychological and behavioral variables beyond the period reported here remains important. For example, investigating more recent data from the persisting Omicron wave may reveal weaker relationships between infection rates and attitudes and behaviors than observed for early 2022. Furthermore, stringency of regulations may change over time (although it did not during the observed period) and it is possible that compliance decreases when regulations become stricter. To that end, data from the app could prove useful for detecting early shifts in behavior (e.g., leniency or declining compliance; greater protection behavior due to sudden changes in infection dynamics) to improve future forecasting. Finally, we need to emphasize that the presented analyses focused on differences between individuals. Collecting more data from the same participants can help to investigate within-individual variation of attitudes and behaviors.

In summary, the evidence presented here confirms that compliance with regulations and recommendations relates to individual risk perception, trust in federal government, perception of required and recommended measures, and social norms. Hence, interventions may be more effective when they do not only focus on risk perceptions but also on social influence. Empowering (intrinsically) compliant individuals to exhibit compliance with pandemic rules and recommendations in everyday social interactions may help to increase compliance among those who care less about protective behaviors. In short, encouraging individuals to act as a role model for friends, family members, neighbors, colleagues, and even strangers, may help to mitigate the pandemic.

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Credit Author Statement

Philipp Sprengholz: Conceptualization, Methodology, Investigation, Formal analysis, Visualization, Writing – original draft. Robert Bruckmann: Formal analysis, Writing – review & editing. Marc Wiedermann: Conceptualization, Methodology, Writing – review & editing. Dirk Brockmann: Conceptualization, Methodology, Writing – review & editing, Funding acquisition. Cornelia Betsch: Conceptualization, Methodology, Writing – review & editing, Supervision, Funding acquisition.

Ethical declaration

The study received ethical clearance from the University of Erfurt's IRB (#20220414). All participants provided informed consent for the anonymized use and sharing of their data for scientific purposes.

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.

Data availability

Data are available at https://doi.org/10.5281/zenodo.7185199 and materials and the data analysis script are stored at https://dx.doi.org/10.17605/OSF.IO/2XNSV

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