



How political orientation, economic precarity, and participant demographics impact compliance with COVID-19 prevention measures in a Dutch representative sample

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Abstract

We examine the relationship between individuals' political orientations and their compliance with and attitudes towards COVID-19 prevention measures using a Dutch nationally representative online sample. Due to ideological differences, we predict that people with left-wing and progressive orientations will comply more with and have more favourable attitudes towards COVID-19 prevention measures than people with right-wing, populist, and conservative orientations, while right-wing extremists will have lowest levels of compliance and least favourable attitudes towards prevention measures. Our results support these predictions. Furthermore, we test the effect of individuals' economic precarity and demographic characteristics on compliance and attitudes towards prevention measures. Results show that people experiencing economic difficulties do comply yet have less favourable attitudes towards the measures, while fear of economic loss is related to both lower compliance and less favourable attitudes towards measures. Older citizens have higher levels of compliance and more positive attitudes, whereas gender and education are not consistently related to compliance and attitudes. We further explore how these three sets of factors (political orientation, economic precarity, and demographics) are related to policy preferences for either reducing infection rates or reducing the economic impact of the pandemic. Our results suggest that all three sets of predictors are important in shaping measure compliance as well as attitudes and policy support and should all be considered for a comprehensive understanding of individuals' responses to COVID-19 measures.

Keywords Political orientation · Economic precarity · COVID-19 norm compliance · Coronavirus

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Introduction

When the world faced the COVID-pandemic in 2020, government responses introducing public health measures to curb the virus spread varied both in content and speed (Hale et al. 2020). Public responses also diverged substantially across and within countries. Particularly mask-wearing and social distancing measures—including closure of bars, shops, restaurants, educational institutions and public services—quickly became heavily contested social and political issues. For example, violent protests broke out in several Dutch cities in January 2021, after the government implemented a strict curfew.

The success of pandemic control measures, in particular mask-wearing and social distancing, heavily depends on citizens' voluntary compliance and their willingness to give up freedom of movement and social activities (Van Bavel et al. 2020). For authorities, particularly in democracies, it is problematic to curb freedom of movement and gathering, making compliance with new measures dependent on convincing individuals and societal groups of the necessity of these restrictions to reduce the spread of the virus.

However, some groups will less rigorously follow government measures, which entails a public health risk and can overburden health services. Such disparities in compliance between sections of the population are well-known, as shown in, for example, belief in conspiracy theories and rejection of scientific evidence regarding the pandemic (Eberl et al. 2021). Because COVID-19 is an airborne infectious disease, ignoring the guidelines puts fellow citizens at risk and endangers public health, security, and the economy. Our investigation focuses on responses to health measures taken by authorities in the Netherlands. We currently know little about what drives the compliance behaviours and the attitudes towards COVID-19 prevention measures of people in the Netherlands. This study focuses on the Netherlands as a crucial case, as a number of characteristics set it apart. First, the country's infection rates have frequently outpaced those of surrounding countries, requiring stricter measures. Second, the nature of policy formation in the Dutch consensus-democracy, in which policies are developed in extensive consultation with many stakeholders, does not facilitate rapid and strict rule enforcement. Third, due to a proportional electoral system, a wide variety of political orientations remain salient in designing policies, potentially leading to accentuated discontent with some novel measures among those supporting populist and/or anti-establishment parties not represented in government (Geurkink et al. 2020). Therefore, we aim to investigate how different types of predictors will influence responses to the prevention measures in the Netherlands.

First, we focus on political orientation to explain compliance with measures to curb the spread of the Coronavirus (Van Bavel et al. 2022). Second, because the pandemic asymmetrically impacts on individuals in society, with disproportionately detrimental effects on those in economically precarious situations (Engbersen et al. 2021), economic factors are also likely to play an important role. Therefore, we also investigate how economic precarity impacts compliance with health measures. Lastly, considering social and demographic differences in infection



rates (RIVM 2020), we assess diverging levels of support and compliance with COVID-19 measures across different groups in the population.

In short, we assess differences in compliance to official prevention measures and attitudes towards these with three sets of predictors (1) political orientation, (2) economic precarity and (3) demographics. As such, we integrate different but inherently connected research areas to establish an integrative view of predictors that are relevant for compliance. Furthermore, we investigate how individuals respond to the prevention measures in different ways. Specifically, we assess responses in terms of behavioural compliance, attitudes towards the measures, and policy preferences. These outcomes tap into different types of responses, and can provide a comprehensive overview of how people respond to the government measures.

Theoretical background

Political orientation and compliance

Political orientation is an important part of one's values and identity that provide an interpretational framework that guides responses and behaviour during impactful events like a pandemic. People's economic considerations (e.g., taxation, government spending) are often aggregated into a left–right dimension, while moral and cultural issues are often aggregated into a progressive versus conservative dimension.

These political orientations are likely to shape individuals' response to the measures. People with a more left-leaning and progressive political orientation, on the one hand, show higher compliance with official COVID guidelines (Allcott et al. 2020; Grossman et al. 2020; Gualda et al. 2021), likely because they value the common good and trust governmental institutions and science more. On the other hand, studies show that a more conservative outlook results in lower perceptions of vulnerability to COVID-19 (Calvillo et al. 2020), and that social distancing measures were respected more in Democratic-leaning compared to Republican-leaning areas in the US (Allcott et al. 2020; Grossman et al. 2020), likely because they are reluctant towards state interventions that restrict individual freedom or affect economic success.

Additionally, political orientations influence individuals' openness to receiving politically relevant information. When people distrust and ignore evidential information and advice from government and health authorities or mainstream media during a pandemic, they may risk their own life and that of others (Engbersen et al. 2020). As such, we expect political orientations to influence compliance with COVID-19 measures.¹

¹ The hypotheses were pre-registered at <https://osf.io/fgudz>.



H1 People with an (a) economic right-wing and (b) culturally conservative orientation are less likely to comply with government guidelines and have less favourable attitudes towards measures to contain infections than people with an economic left-wing and culturally progressive orientation.

Next to diverging directions in ideological outlook, we also zoom in on the impact of ideological extremism on compliance because strength of political beliefs received less attention so far. Extremists—on both the left and right—are more distrustful of fellow citizens, political institutions, and actors compared to political moderates. Politically trustful people evaluate political institutions and performance of political actors more positively than distrustful citizens. Consequently, trust is strongly related to accepting political decisions—such as COVID-19 measures—as legitimate and beneficial to society or economy (Krouwel et al. 2021).

While people on the political left and right extremes may endorse diametrically different societal and economic policies, they share important psychological similarities that distinguish them from political moderates. More precisely, political extremists display overconfidence in their political judgement, more often hold unfounded and rigid beliefs that are often impervious to opinion-adverse information, and are more intolerant towards people or groups with different opinions, outlooks in life, or socio-cultural backgrounds (van Prooijen and Krouwel 2019). Political extremists are also more likely to distrust official information and reject opinion-adverse information. They are also more gullible, showing higher receptivity and credulity in obscure news items or even supernatural beliefs. Such high gullibility combined with distrust of official information from power holders and institutions is strongly related to conspiracy belief (Zwicker et al. 2020), which is more prevalent among both left and right extremists (Imhoff et al. 2022). As shown by previous research, conspiracy beliefs predict COVID-19 health behaviours (van Prooijen et al. 2021). Individuals process and systematise information that they deem relevant, including misconceptions, falsities and conspiracy theories, to orient themselves in the political realm and to reduce the world's complexity (Morgan and Wisneski 2017). This could be disastrous during a pandemic, when relying on government communication and advice is crucial for managing the effects of the pandemic (Calvillo et al. 2020). These considerations lead to the following hypotheses:

H2 Political extremists on both the left and right are less likely than moderates to comply with measures, have less favourable attitudes towards government measures, and are less likely to prefer policies to contain infections; right-wing extremists are the least likely to comply and have the least favourable attitudes.

H3 Supporters of (a) government parties are more likely to comply with measures, have more favourable attitudes towards measures, and are more likely to prefer policies that aim to contain infections, whereas (b) supporters of (populist) anti-system



parties are less likely to comply and have less favourable attitudes towards government measures.

Economic precarity and compliance

Favourable or unfavourable attitudes towards COVID-19 prevention measures and compliance with these measures may depend on the precariousness of individuals' personal economic position and work situation. People with low income may face constraints in their capacity to respond to novel social distancing and hygiene measures, for different reasons. For example, they may have lower access to information (Norris 2001), lower ability to process information effectively and make decisions (Xie et al. 2020), and a history of engaging in high risk behaviours like smoking, drinking, and unhealthy dietary behaviour (Fukuda et al. 2005). Furthermore, low income often constrains people's capacity to work from home, their ability to afford taking a prolonged leave of absence or unpaid time off work. Moreover, low-income people are more likely to lose their job or some portion of their income during times of economic uncertainty. This occurred around the globe during the COVID-19 crisis (Kartseva and Kuznetsova 2020). Lower income groups are also less likely to have savings that they can rely on to meet their basic needs for extended periods of time (Orhun and Palazzolo 2019). Lastly, people with low income are less likely to have large homes or access to open space where they reside (Astell-Burt et al. 2014).

Recent studies confirmed this pattern. In poor areas of the US there was higher mobility during the pandemic, whereas people in higher-income areas reduced their mobility compared to pre-pandemic levels, indicating that low-income communities engaged in less social distancing in the first months of the pandemic (Weill et al. 2020). Another study, found that higher-income individuals were more likely to work from home and to adopt practices of social distancing, more frequent hand washing, and mask-wearing (Papageorge et al. 2020). Higher shares of working from home were found in high-income groups already before the pandemic (15% vs. 11% for low-income people), and this gap only increased during the first months of the pandemic (64% vs 40%; von Gaudecker et al. 2020). This suggests that compliance with and having favourable attitudes towards COVID measures is more likely among those with higher income. Contrarily, gig economy workers (e.g., self-employed delivery workers) with lower income were more likely to work outside their homes even after lockdown measures, and less likely to believe government support would apply to them because they did not have traditional work contracts (Stabile et al. 2020).

Interestingly, in the first months of the pandemic people with higher income were more likely to be diagnosed with COVID-19, possibly due to more testing among wealthier people (Schmitt-Grohe et al. 2020), yet more severe acute respiratory infection cases with unknown sources were more frequent among those with lower income (de Souza et al. 2020), who were less likely to conform to prevention measures. These considerations lead to the following hypothesis:



H4 Individuals' economic precarity is related with lower compliance, less favourable attitudes towards prevention measures, and a preference for limiting the economic impact of measures over limiting infection rates.

Demographic characteristics and compliance

In addition to political orientation and economic precarity, structural background characteristics also play an important role in compliance with measures to slow the spread of COVID-19. First, younger people (i.e., teens and young adults) were responsible for growing COVID-19 infection rates, which was visible in data on confirmed infections with COVID-19 in the Netherlands (RIVM 2020) and other countries (e.g., Goldstein and Lipsitch 2020). This suggests that younger people are less compliant with prevention measures than older people. However, literature on COVID-19 measure compliance does not show consistent age effects. While some studies find no age effects on compliance (e.g., Dryhurst et al. 2020), other studies indicate that younger adults comply less with prevention measures and take less health precautions (Clark et al. 2020; Masters et al. 2020). Moreover, it has been demonstrated that younger people miss social contact more, which could explain their lower compliance with social distancing and higher infection rates (Engbersen et al. 2020).

Second, gender differences in infection rates have not caught public attention. Some studies show no major differences in infection rates among men and women, yet in the Netherlands men have been infected less than women (Gebhard et al. 2020; RIVM 2020). However, since women are overrepresented in the health sector and often have more care duties, this does not mean women comply less than men. In fact, previous studies indicate that women actually perceive higher risks of COVID-19, and report more compliance to measures to prevent the spread of COVID-19, such as social distancing and mask-wearing (e.g., Clark et al. 2020; Dryhurst et al. 2020; Nivette et al. 2021; Galasso et al. 2020; Masters et al. 2020). It is well possible that men are less compliant with the COVID-19 prevention measures and still have lower infection rates.

Finally, educational differences may play an important role, particularly as risks of infection are elevated in communities characterised by low educational attainment (Gray et al. 2020). Evidence for an impact of educational level on compliance is mixed, with some studies finding differences per measure or no effects at all (Dryhurst et al. 2020). What research does unearth is that lower educational attainment is related to lower knowledge of COVID-19 and poorer working memory capacity, both of which relate to lower compliance (Xie et al. 2020; Nivette et al. 2021). Moreover, higher educated people perceive higher infection risk than lower educated people, which can also lead to differences in compliance (Ciancio et al. 2020). Lastly, jobs related to higher educational attainment are more likely to allow people to follow guidelines such as working from home (e.g., office jobs moving to teleworking), compared to other jobs requiring physical presence and human contact (e.g., healthcare workers, supermarket employees). The above leads to the following



hypothesis (see also Table 1 in the Supplementary materials for an overview of hypotheses):

H5 Participants that are (a) older, (b) female and (c) higher educated will have higher levels of compliance, have more favourable attitudes towards prevention measures, and prefer limiting infection rates over limiting the economic impact of measures.

Method

Design and sample

The study was conducted between May 8–15, 2020 (see Fig. 1) among Dutch participants who volunteered to fill in a survey after being recruited through a combined stratified and random sample developed by Kieskompas, a Dutch research institution that acts in line with the Dutch Data Protection Authority (Autoriteit Persoonsgegevens) and within the ethical norms of Vrije Universiteit Amsterdam. Email invitations with an online link to participate were sent to 46.657 panel members between May 8 and 11, 2020. Reminder emails were sent on May 12th and 14th, 2020. We received 16.945 responses providing sufficient information that allow for data weighting.² The survey was completed by 10.317 men and 6.628 women; Average age was 56 ($SD = 15.9$); 5608 (33.1%) had a bachelor degree, and 4225 (24.9%) had completed master or doctoral studies.

Data weighting

To account for demographic imbalances and differential participation rates, the data was weighted by post-stratification and iterative proportional fitting (see Valliant 1993; Rao et al. 2002) based on the Dutch National Golden Standard, accounting for respondents' age, gender, education level, ethnicity and region (Nielsen). Next to this, we adjusted for partisan bias by weighting on vote recall in the 2017 Parliamentary election. To improve the coverage of all political parties, weighting on vote recall was implemented on the provincial, rather than the national level. The final product is a dataset representative of the Dutch population on these benchmarks.

² 19.848 respondents started the survey, but 2.903 of those did not provide sufficient information to be included in the weighting procedure, for which data is needed on all weighting benchmarks (i.e., age, gender, education, region, ethnicity, and vote recall).



Measures

All variables described below are reported by participants. Table 2 in the Supplementary materials presents an overview study of variables.

Political orientation

Participants were asked to place themselves on an 11-point scale representing the economic left–right dimension, as well as a separate scale representing the political progressive-conservative dimension. We coded these scales from -5 to $+5$, with -5 indicating economic left or political progressive and $+5$ indicating economic right or political conservative. Because some analyses required the left–right political orientation variable to be in a categorical format, we re-coded it into 5 categories (-5 , -4 =extreme left; -3 , -2 , -1 =moderate left; 0 =moderates/centrists; 1 , 2 , 3 =moderate right; 4 , 5 =extreme right).

Participants indicated their propensity to vote for each of 13 parliamentary parties using a scale from 0 (very unlikely) to 10 (very likely). At the time of data collection, coalition partners were the liberal VVD, the Christian democratic CDA, progressive-liberal D66, and the orthodox Christian conservative CU). Propensity to vote for anti-system parties was calculated as the average preference for PVV, FvD, PvdD, 50+ and SP.

Economic precarity

Participants indicated on a scale from 1 to 6 the ease (1) or difficulty (6) with which they cope with the income of their household. Furthermore, fear of economic loss / income loss was measured by asking people whether they fear losing their job (employed participants) or fear not being able to find a job (unemployed participants), and fear that their own business would go bankrupt (self-employed participants). These items were averaged if participants had multiple sources of income. A second item asked participants whether they fear losing the majority of their income. Both items were rated on a scale from 1 (*not at all afraid*) to 4 (*the described event happened*) and were averaged to form a single fear of economic loss indicator.

Measure compliance

Participants reported the extent to which they had changed their level of compliance with measures since the beginning of the lockdown, on March 15th, using a bipolar scale from -2 (a lot worse) to 2 (a lot better). Furthermore, they indicated on two binary variables (coded 0 =no; 1 =yes) whether they keep a social distance of 1.5 m with people outside their household, and whether they wash their hands often.



Attitudes towards measures

Participants indicated on two binary variables (coded 0=no; 1=yes) whether they take the government measures seriously, and whether they agree with the measures. Next, participants indicated on a 9-item scale how effective the measures were in reducing the spread of the COVID-19, using a response format from 1 (not at all effective) to 5 (very effective), for example, “washing hands often”, “not shaking hands”, “avoiding crowds”, which resulted in a reliable measure ($\alpha=0.84$).

Preferred policy trade-off

Participants indicated on a bipolar item the extent to which they preferred policies that prevent infections (0) or prevent income and job loss (100).

Analytical procedure

To test our hypotheses, we conducted 3 hierarchical linear regressions and 4 hierarchical logistic regressions, in which participants' age, gender and education level were entered as predictors in step 1. In step 2 we entered the economic precarity indicators (difficulty of coping with current income and fear of economic loss), and in step 3 we entered political orientation variables (left–right orientation, progressive-conservative orientation, propensity to vote for current government, and propensity to vote for anti-system parties).

Results

Below we report regression results from the third step of the hierarchical regressions, in which all predictors were entered; respective coefficients are presented in Table 1. Tables presenting all three regression steps can be found in the online supplementary materials.

Political orientation, measure compliance and attitudes towards measures

Left–right orientation

As predicted by H1a, right-wing orientation was related negatively to measure compliance in terms of changes in measure adherence, respecting social distancing, and frequent hand washing. Furthermore, right-wing orientation was related to less favourable attitudes towards measures, in terms of taking measures seriously, agreeing with measures, and seeing measures as effective.





Table 1 Multiple regression results (third step in hierarchical regression analysis)

	Measure compliance			Attitudes towards measures				Policy trade-off	
	Change compliance			Take meas- ures seriously		Agree measures		Effectiveness of measures	
	β		<i>OR</i>	<i>OR</i>		<i>OR</i>		β	β
Age	.19***		1.04***	1.03***		1.05***		.17***	.004
Sex	0		1.12*	1.18*		1.34***		.17***	.004
Education level	-.05***		.93***	.97		1.12***		.02*	.08***
Difficulty coping on current income	.05***		1.08**	1.12**		1.13***		-.06***	-.03**
Fear of economic loss	-.03**		.87***	.89*		.80***		.008	.09***
Left-right orientation	-.03**		.96***	.93***		.95***		-.09***	.25***
Progressive-conservative orientation	0		.98	.95**		.95***		-.09***	.02*
Vote propensity government coalition	.01		1.04*	1.05**		1.06***		.22***	-.04***
Vote propensity anti-system parties	-.05***		.93***	.93***		.97		-.08***	-.002
<i>R</i> ²	.05		.09‡	.05‡		.05‡		.13	.07

N = 16,954; ‡Nagelkerke *R*²

OR odds ratio

Dummy variables coded with 0 = no, and 1 = yes; ****p* < .001; ***p* < .01; **p* < .05

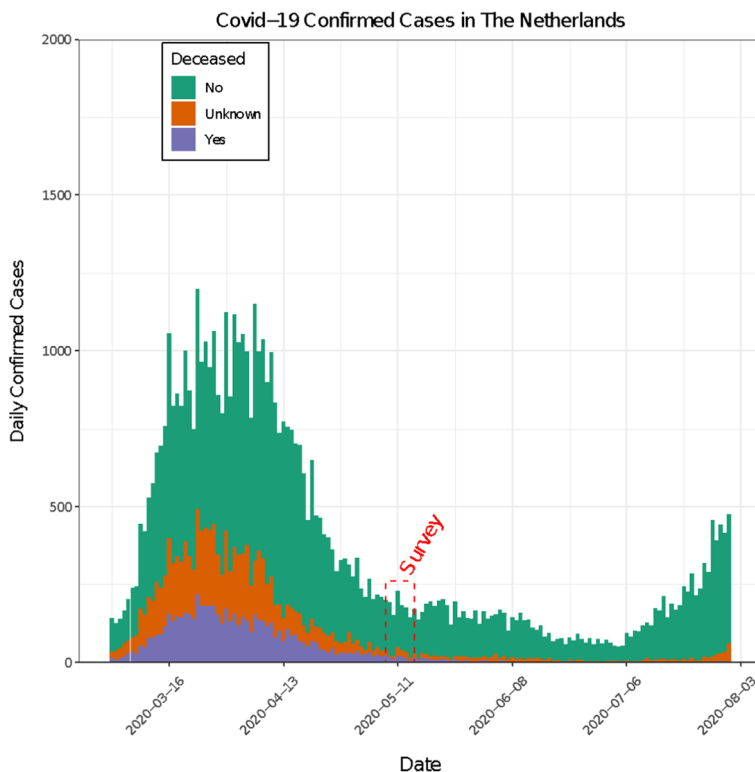


Fig. 1 Confirmed COVID-19 cases in the Netherlands until August 2020

Progressive-conservative orientation

Although H1b predicted that having a conservative orientation is related to lower measure compliance, conservatism was unrelated with compliance in terms of changes in measure adherence and respecting social distancing but was related to a lower likelihood of washing hands. As expected, conservative orientation was related to less favourable attitudes towards measures, in terms of taking measures seriously, agreeing with measures, and seeing measures as effective.

(Left-right) extremism

To test H2, we regressed changes in adherence on left-right orientation, and estimated linear, quadratic and cubic effects. As expected, results showed a negative cubic effect, $\beta = -0.04$, $p = 0.002$, which suggests that people with a moderate political orientation reported more positive change in adherence than those with extreme orientations; those with an extreme-right orientation reported a negative change in adherence, whereas those with an extreme left-wing orientation reported a positive change in adherence (see Fig. 2A). The linear effect



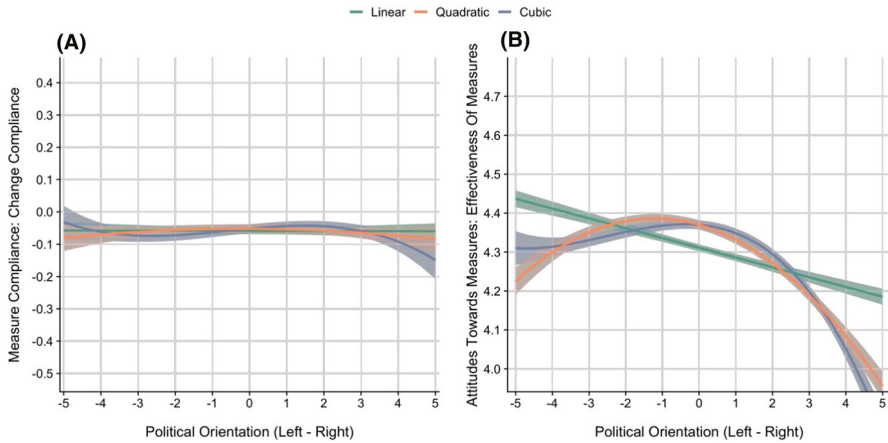


Fig. 2 Linear, quadratic, and cubic effects for change in adherence and measure effectiveness, as a function of left–right political orientation. The y-axes are centred at the mean and extend $\pm 0.75SD$ (Witt 2019). Graphs per effect in the full range of the dependent variables can be found in Supplementary Materials

was $\beta = 0.03$, $p = 0.014$, and the quadratic effect was $\beta = -0.02$, $p = 0.077$. These results support our hypothesis.

Next, we regressed measure effectiveness on left–right-wing orientation. Results showed a negative cubic effect, $\beta = -0.09$, $p < 0.001$, indicating that people with an extreme-right orientation rated the measures as least effective, whereas those with an extreme left-wing orientation rated the measures as less effective than moderates (see Fig. 2B). The linear effect was $\beta = -0.03$, $p = 0.023$, and the quadratic effect was $\beta = -0.12$, $p < 0.001$. This also shows that extremists were less convinced about the utility of infection prevention measures compared to political moderates.

To further test H2 for the binary outcome variables, we used a categorical format of the left–right orientation. Results summarised in Table 2 showed that fewer right-wing extremists engaged in social distancing (84.1%) than left-wing extremists (87.3%), and moderates (90.7%), $\chi^2(4) = 31.64$, $p < 0.001$. Frequent hand washing was less prevalent among right-wing extremists (86.2%) than left-wing extremists (93.1%), and moderates (94.7%), $\chi^2(4) = 58.13$, $p < 0.001$. Fewer right-wing extremists took regulations seriously, (83.7%) than left-wing extremists (90.2%), and moderates (90.4%), $\chi^2(4) = 58.22$, $p < 0.001$. Lastly, fewer right-wing extremists agreed with the government measures, (93.5%) than left-wing extremists (98.5%), and moderates (97.4%), $\chi^2(4) = 66.88$, $p < 0.001$.

Overall, these results suggest that right-wing extremists complied the least and had the least favourable attitudes towards the measures, while differences between left-wing extremists and moderates were smaller.



Table 2 Compliance and agreement with government measures by political orientation category (left–right)

		Extreme left		Moderate left		Moderate		Moderate right		Extreme right		Total		χ^2 (4)
		n	%	n	%	n	%	n	%	n	%	n	%	
Social distancing	No	121	12.7	595	11.2	216	9.3	858	12.7	106	15.9	1896	11.8	31.64 ***
	Yes	835	87.3	4701	88.8	2105	90.7	5911	87.3	562	84.1	14,114	88.2	
Hand washing	No	66	6.9	358	6.8	123	5.3	475	7.0	92	13.8	1114	7.0	58.14 ***
	Yes	890	93.1	4938	93.2	2198	94.7	6294	93.0	576	86.2	14,896	93.0	
Take measures seriously	No	94	9.8	469	8.9	222	9.6	818	12.1	109	16.3	1712	10.7	58.22 ***
	Yes	862	90.2	4827	91.1	2098	90.4	5951	87.9	560	83.7	14,298	89.3	
Agree measures	No	14	1.5	106	2.0	60	2.6	122	1.8	43	6.4	345	2.2	66.88 ***
	Yes	942	98.5	5189	98.0	2260	97.4	6648	98.2	625	93.6	15,664	97.8	

Propensity to vote for government coalition parties

Although we expected people with high vote propensities for coalition parties to report high measure compliance, propensity to vote for one of the ruling coalition parties at the time was unrelated to compliance in terms of changes in measure adherence but was related with respecting social distancing and frequent hand washing. In line with H3a, higher propensity to vote for the coalition parties was related to favourable attitudes towards measures, in terms of taking measures seriously, agreeing with measures, and seeing measures as effective.

Propensity to vote for anti-system parties

As predicted by H3b, propensity to vote for anti-system parties was related with low measure compliance in terms of changes in measure adherence, respecting social distancing measures, and frequent hand washing. Despite our predictions, propensity to vote for anti-system parties was unrelated to attitudes towards measures, in terms of taking measures seriously, agreeing with measures, but, as hypothesised, was negatively related to evaluations of current measures as effective.

Thus, the pattern of results suggests that people with unfavourable attitudes towards measures, who think these are ineffective and could damage the economy, still comply with measures as they may want to avoid personal and collective risks to health.

Economic precarity, measure compliance and attitudes towards measures

Difficulty of coping with current income

Contrary to our expectations formulated in H4, difficulty of coping with current income was associated with higher compliance in terms of changes in adherence to measures, as well as respecting social distancing and frequent hand washing. Furthermore, contrary to our predictions, difficulty of coping with current income was associated with more favourable attitudes in terms of taking government measures seriously, yet financial difficulties predicted lower agreement with current government measures, and, as expected, were related with perceiving the current measures as effective. Therefore, those facing economic hardship reported taking regulations seriously, but also perceived these as less effective.

Therefore, people manifest an attitude-behaviour inconsistency, with 'reluctant' compliance in behavioural terms, but disagreement and discontent at the evaluative level. In the supplementary information materials, we present exploratory analyses of interactions between difficulty of coping with income and education level. These show that for lower educated people, as predicted, difficulty of coping with current income was associated with negative change in measure adherence and lower perceived measure effectiveness. However, these patterns are in the opposite direction (positive change in adherence) or weaker (measure effectiveness) for highly educated participants. Possibly, higher educated people who experienced economic difficulties did not show the predicted low measure compliance and unfavourable attitudes because they may



be more able to understand the importance of the measures, or they may have more resources they can rely on (e.g., career prospects, social network, optimism).

Fear of economic loss

However, as expected (H4), fear of economic loss was related negatively to measure compliance in terms of changes in measure adherence, respecting social distancing, and frequent hand washing. Furthermore, as expected, fear of economic loss was related to less favourable attitudes towards measures, in terms of taking measures seriously, but was unrelated with both agreement with measures and seeing measures as effective. Therefore, we find limited evidence that fear of economic loss is related with less favourable attitudes towards measures.

Demographics, measure compliance and attitudes towards measures

Age

As predicted by H5a, participants' age was related positively to measure compliance in terms of changes in measure adherence, respecting social distancing, and frequent hand washing. These results show that older people were more likely to comply with the prevention measures, probably due to facing disproportionately higher health risks. Furthermore, age was related to favourable attitudes towards measures, in terms of taking measures seriously, agreement with measures, and seeing measures as effective. Therefore, older participants showed more favourable attitudes towards measures.

Gender

Although we expected women to comply with measures more than men, gender was unrelated to changes in measure adherence. However, as predicted, women reported respecting social distancing and more frequent hand washing. Overall, women reported higher compliance to the COVID-19 prevention measures. Furthermore, in line with H5b, women had more favourable attitudes than men in terms of taking government regulations seriously but did not agree more with current government measures. However, women rated the current measures as more effective than men. Overall, women had more favourable attitudes towards measures than men.

Education level

Contrary to H5c, higher educated participants reported lower compliance with measures in terms of changes in measure adherence and respecting social distancing. Education level was not related to frequent hand washing. These findings indicate that higher educated people complied less, and not more with the prevention measures. However, as expected, participants' education level was related favourable



attitudes in terms of taking measures seriously, but education was unrelated with agreement with measurers. However, as predicted, education was positively related with perceived effectiveness of current measures. Overall, this indicates that people with higher education had more favourable attitudes towards measures.

Preferred policy trade-off: reduce infection or reduce economic impact

As expected, right-wing and conservative orientations were related to preferences for reducing the economic impact of COVID-19. Furthermore, the propensity to vote for the current government coalition was related to a preference for reducing infections, which is also what the current government prioritised. Importantly, higher vote propensities for anti-system parties were not related to policy preferences.

Furthermore, contrary to expectations, but consistent with patterns observed on other variables, difficulty of coping with current income was related with a preference for reducing infection rates. However, as predicted, fear of economic loss was related to a preference for reducing the economic impact of COVID-19.

Although we predicted that women and older people would favour policies aimed at reducing infections, age and gender were unrelated to policy preferences. However, although this was not hypothesised, education was related to a preference for reducing the economic impact of COVID-19. Therefore, political orientation had the expected impact on preferred policies, whereas demographics were unrelated to this. We further discuss these effects below.

Discussion

This study showed that during pandemics, political orientation affects compliance with preventive measures to curb infection rates, which is a crucial finding given that individuals' compliance can be a matter of life and death. Results showed surprising relationships between individuals' compliance with and attitudes towards the preventive measures and the economic precariousness and social background of respondents.

As predicted, people with a right-wing orientation reported lower compliance with and less favourable attitudes towards government measures to reduce infections, which was partly driven by their concern about the economic impact of reduced social interaction. Right-wing citizens prefer measures that reduce the economic impact over those that reduce infection rates. Like earlier studies, we find that political extremists are less likely than political moderates to comply and to have favourable attitudes towards preventive measures, with right-wing extremists even less inclined to do so than left-wing extremists. As was evidenced in late January 2021, some were even willing to take to the streets in defiance of a curfew in the Netherlands. In particular supporters of right-wing populist parties perceived the preventive measures not only as economically destructive, but also as violating their core freedoms. Similar to what could be witnessed in the USA, populists in the



Netherlands also fiercely fulminated against mask-wearing, social distancing, and particularly the curfew, and portrayed such measures as unwanted state repression. On the political left, concern with economic damage was also present, but a left-wing political orientation was related to perceiving state intervention as more desirable as these restrictions aim to reduce infections.

On the cultural progressive-conservative dimension, we found less clear political sorting. Conservatism was unrelated to compliance, yet conservatives were less likely to have favourable attitudes towards preventive measures and clearly favoured prioritising the economy over reducing infections. As predicted, higher vote propensities for government parties were related with higher compliance and favourable attitudes towards measures, whereas those more likely to vote for anti-system parties had lower levels of compliance. Yet, anti-system support was unrelated to attitudes towards measures. This weak relation may be caused by the fact that we aggregated various strands of system rejection from widely differing political orientations and policy preferences. Anti-system politics in the Netherlands pull in different directions.

Most surprising were our findings of the impact of economic hardship and precarity. People in dire economic situations report high measure compliance and take the measures seriously, yet we found no clear relation with attitudes towards measures. Specifically, the economically precarious comply with, but do not necessarily agree with preventive policies and strategies of the authorities. Contrary to our logic, people having difficulty coping with their income prefer policies that reduce infections over measures that limit economic damage. Exploratory analyses showed that education is key to understanding this. Economic hardship combined with lower educational attainment related to lower measure adherence and more negative perceptions of the effectiveness of preventive measures. For higher educated participants, the effect of financial difficulties pointed in the opposite direction, with more measure adherence and more positive perceptions of the effectiveness of measures. As predicted, fear of economic loss was related to both low compliance and preferences for reducing the economic impact of the COVID-19, yet no consistent effect was found for attitudes towards measures.

Together, these findings show the complex choices the precarious face. People in difficult economic situations do comply with measures, possibly driven by a need for health preservation and reducing the risk of more income loss, as well as a hope that stricter measure adherence will keep more economic activities possible, which could help them regain lost income. However, the more people fear economic loss, the more measure compliance declines. This suggests that the dilemma of self-preservation versus income loss is less important for those with higher income and/or jobs that can be done from home but poses a difficult choice for people with more practical education in contact professions.

Finally, as predicted, older participants reported higher compliance and more favourable attitudes towards preventive measures, but age was not related to a specific policy preference. The elderly perceive high health risks, and benefit directly from measure adherence, as this reduces the chance of infection, regardless of which parties implemented them. Younger people, however, perceive lower health risk and are thus less inclined to adhere to measures so that they can increase the social



contacts they crave. Thus, age determines behaviour, but not a policy preference on whether to reduce infections or protect the economy (for similar findings see Clark et al. 2020).

Women reported higher compliance and more favourable attitudes, although not consistently on all measures. This is in line with other studies that also find that women place higher importance on collective and public arrangements and have more communitarian orientations. Higher levels of precautions in contact professions may also contribute to this gender gap (Clark et al. 2020; Dryhurst et al. 2020; Galasso et al. 2020; Nivette et al. 2021). Similar to age, gender determined behaviour, but was unrelated to policy preference on whether to reduce infections or protect the economy.

Education level had mixed effects: higher education was related with low compliance and—contradictory—with favourable attitudes towards measures, as well as a preference for reducing the economic impact of the pandemic. One potential explanation for this apparent contradiction could be that higher educated people understood the importance of the measures and strictly adhered to them at the start of the pandemic but lowered their compliance as the pandemic lasted. Another mechanism might explain why people with higher educational levels prefer limiting the economic impact over infection prevention: they may own businesses and wish to protect their financial assets.

Implications

Our study shows that political orientation is strongly predictive of people's compliance and attitudes towards COVID-19 measures, above and beyond the effect of economic precarity and demographics. Political orientations are therefore crucial in understanding how people perceive and react to government measures during a pandemic. Authorities should take this into account when implementing policies. Moreover, the curvilinear effects of left–right orientation on compliance and attitudes regarding the measures provide insight into the political polarisation over COVID-19 measures and the ensuing violence in the Netherlands. While it is impossible to design measures and policies that are acceptable and likely to be followed by all, reactions are fairly predictably related to political outlook.

Equally relevant was our finding that economic precarity creates a devil's dilemma during a pandemic. People in dire economic conditions and those who suffered or feared economic losses during this pandemic manifest a “split mind”: they need to conform to prevention measures as they would suffer disproportionately negative effects if they become ill (weak protection on the labour market and no financial buffers), yet they perceive that the measures and policies are not in their own direct economic interest. Such profound inconsistencies between (forced) behaviour and actual beliefs and preferences may not be sustainable over a longer period. Similar dilemmas occur from a life cycle perspective: older people strictly adhere to social distancing measures, even if they do not



politically agree or face severe social and economic costs, the health risks are simply too high. The dilemma of the young is that they need social contact, yet official restrictions are real obstacles. They may agree with the policies, but they break them out of social, psychological and physical needs.

Such complex patterns could be better understood by including the three models, showing the need for interdisciplinary perspectives on the pandemic. To understand why and when people comply it is crucial to mitigate the threats posed by COVID-19. Insights that fail to consider demographical, economic, *and* political variables could lead to actions that are not fully effective, or worse, counterproductive. In particular, our results indicate the need to build bridges between political psychology, economic policy, and sociology. Integrating theories and methods across these fields promises a fruitful avenue to further understanding behaviour in the current crisis, and inform policy that can contribute to effectively curbing the COVID-19 pandemic.

Limitations and future research

Our work has a few limitations. First, our cross-sectional data collection cannot capture transformation in attitudes and behaviours during the evolution of the pandemic. Thus, these effects should be examined in longitudinal designs. Second, our sample was from the Netherlands, which limits generalizability of the results. Third, our measures of compliance were self-reported by participants, and may not be as objective as hard measures of behaviour, for example due to memory biases or social desirability. However, these arguments could be used to make the case that we conducted a relatively conservative test of the hypotheses (for example, finding the hypothesised effects despite potential memory biases). Overall, we are confident that this data, from a large nationally representative sample, has yielded reliable and valid results, which we hope will inform further research and policy on managing the pandemic.

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Author contributions ME and TDC: conceptualisation, manuscript drafting, and data analysis. TE and AK: survey design, sampling, data collection, and weighting. All authors contributed to the writing of the manuscript and approved the final version of the manuscript for submission.

Declarations

Conflict of interest The last author André Krouwel is founder and stockholder of Kieskompas (data collection service), but has not financially benefited from this data collection or study.



References

- Allcott, H., L. Boxell, J. Conway, M. Gentzkow, M. Thaler, and D.Y. Yang. 2020. Polarization and public health: Partisan differences in social distancing during the COVID-19 pandemic. *Journal of Public Economics* 191: 104254.
- Astell-Burt, T., X. Feng, S. Mavoa, H.M. Badland, and B. Giles-Corti. 2014. Do low-income neighbourhoods have the least green space? A cross-sectional study of Australia's most populous cities. *BMC Public Health* 14: 292.
- Calvillo, D.P., B.J. Ross, R.J.B. Garcia, T.J. Smelter, and A.M. Rutchick. 2020. Political ideology predicts perceptions of the threat of COVID-19 (and susceptibility to fake news about it). *Social Psychological and Personality Science* 11: 1119–1128.
- Ciancio, A., F. Kampfen, I.V. Kohler, D. Bennett, W. Bruine de Bruin, J. Darling, et al. 2020. Know your epidemic, know your response: Early perceptions of COVID-19 and self-reported social distancing in the United States. *PLoS ONE* 15 (9): e0238341. <https://doi.org/10.1371/journal.pone.0238341>.
- Clark, C., A. Davila, M. Regis, and S. Kraus. 2020. Predictors of COVID-19 voluntary compliance behaviors: An international investigation. *Global Transitions* 2: 76–82. <https://doi.org/10.1016/j.glt.2020.06.003>.
- De Souza, W.M., L.F. Buss, D. Candido, et al. 2020. Epidemiological and clinical characteristics of the COVID-19 epidemic in Brazil. *Nature Human Behavior* 4: 856–865.
- Dryhurst, S., C.R. Schneider, J. Kerr, A.L.J. Freeman, G. Recchia, A.M. van der Bles, D. Spiegelhalter, and S. van der Linden. 2020. Risk perceptions of COVID-19 around the world. *Journal of Risk Research* 23 (7–8): 994–1006. <https://doi.org/10.1080/13669877.2020.1758193>.
- Eberl, J.M., E. Greussing, and R. Huber. 2021. From Populism to the “Plandemic”: Why populists believe in COVID-19 conspiracies. *Journal of Elections, Public Opinion & Parties* 31 (S1): 272–284.
- Engbersen, G., de Boom, J., Snel, E., & van Wensveen, P. 2021. Gevolgen van de coronapandemie raken kwetsbare gebieden extra hard: De maatschappelijke impact van COVID-19 in de Leefbaarheid & Veiligheidsgebieden in 15 gemeenten. (Working Papers Maatschappelijke Impact COVID-18 #09). https://www.impactcorona.nl/wp-content/uploads/2021/11/Covid_WP977.pdf
- Engbersen, G., van Bochove, M., de Boom, J., Burgers, J., Etienne, T., Krouwel, A., van Lindert, J., Rusinovic, K., Snel, E., van Wensveen, P., & Wentink, T. 2020. *De verdeelde samenleving: De maatschappelijke impact van COVID-19 in Amsterdam, Den Haag, Rotterdam & Nederland*. Kenniswerkplaats Leefbare Wijken.
- Fukuda, Y., K. Nakamura, and T. Takano. 2005. Accumulation of health risk behaviours is associated with lower socioeconomic status and women's urban residence: A multilevel analysis in Japan. *BMC Public Health* 5: 53.
- Galasso, V., V. Pons, P. Profeta, M. Becher, S. Brouard, and M. Foucault. 2020. Gender differences in COVID-19 attitudes and behavior: Panel evidence from eight countries. *PNAS* 117 (44): 27285–27291. <https://doi.org/10.1073/pnas.2012520117>.
- Gebhard, C., V. Regitz-Zagrosek, H.K. Neuhauser, R. Morgan, and S.L. Klein. 2020. Impact of sex and gender on COVID-19 outcomes in Europe. *Biology of Sex Differences*. <https://doi.org/10.1186/s13293-020-00304-9>.
- Geurkink, B., A.S. Zaslove, R. Sluiter, and K.T.E. Jacobs. 2020. Populist attitudes, political trust, and external political efficacy: Old wine in new bottles? *Political Studies* 68: 247–267. <https://doi.org/10.1177/0032321719842768>.
- Goldstein, E., and M. Lipsitch. 2020. Temporal rise in the proportion of younger adults and older adolescents among COVID-19 disease (COVID-19) cases following the introduction of physical distancing measures, Germany, March to April 2020. *Eurosurveillance*. <https://doi.org/10.2807/1560-7917.es.2020.25.17.2000596>.
- Gray, D.M., A. Anyane-Yeboah, S. Balzora, R.B. Issaka, and F.P. May. 2020. COVID-19 and the other pandemic: Populations made vulnerable by systemic inequity. *Nature Reviews Gastroenterology & Hepatology* 17 (9): 520–522. <https://doi.org/10.1038/s41575-020-0330-8>.
- Grossman, Guy, Soojong Kim, Jonah Rexer, and Harsha Thirumurthy. 2020. Political partisanship influences behavioral responses to governors' recommendations for COVID-19 prevention in the United States. *PNAS* 117 (39): 24144–24153.
- Gualda, E., A. Krouwel, M. Palacios-Gálvez, E. Morales-Marente, I. Rodríguez-Pascual, and E.B. García-Navarro. 2021. Social distancing and COVID-19: Factors associated with compliance with



- social distancing norms in Spain. *Frontiers in Psychology* 12: 1–15. <https://doi.org/10.3389/fpsyg.2021.727225>.
- Hale, T., Webster, S., Petherick, A., Phillips, T., & Kira, B. 2020. *Oxford COVID-19 Government Response Tracker*. Blavatnik School of Government.
- Imhoff, R., F. Zimmer, O. Klein, J.H.C. António, M. Babinska, A. Bangerter, M. Bilewicz, N. Blanuša, K. Bovan, R. Bužarovska, et al. 2022. Conspiracy mentality and political orientation across 26 countries. *Nature Human Behaviour*. <https://doi.org/10.1038/s41562-021-01258-7>.
- Kartseva, M.A., and P.O. Kuznetsova. 2020. The economic consequences of the COVID-19 pandemic: Which groups will suffer more in terms of loss of employment and income? *Population and Economics* 4: 26–33.
- Krouwel, A., O. de Vries, L. van Heck, Y. Kutiyski, and T. Etienne. 2021. *COVID-19 en Institutioneel Vertrouwen. Impact Corona: Working Paper #8*. https://www.impactcorona.nl/wp-content/uploads/2021/10/Institutioneelvertrouwen_KL01.pdf
- Masters, N.B., S.-F. Shih, A. Bukoff, K.B. Akel, L.C. Kobayashi, A.L. Miller, H. Harapan, Y. Lu, and A.L. Wagner. 2020. Social distancing in response to the novel COVID-19 (COVID-19) in the United States. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0239025>.
- Miller, A.H. 1974. Political issues and trust in government: 1964–1970. *The American Political Science Review* 68 (3): 951–972.
- Morgan, G.S., and D.C. Wisneski. 2017. The structure of political ideology varies between and within people: Implications for theories about ideology's causes. *Social Cognition* 35 (4): 395–414.
- Nivette, A., D. Ribeaud, A. Murray, A. Steinhoff, L. Bechtiger, U. Hepp, L. Shanahan, and M. Eisner. 2021. Non-compliance with COVID-19-related public health measures among young adults in Switzerland: Insights from a longitudinal cohort study. *Social Science & Medicine* 268: 113370. <https://doi.org/10.1016/j.socscimed.2020.113370>.
- Norris, P. 2001. *Digital divide: Civic engagement, information poverty, and the internet worldwide*. Communication: Society and Politics, Cambridge University Press.
- Orhun, A.Y., and M. Palazzolo. 2019. Frugality is hard to afford. *Journal of Marketing Research* 56: 1–17.
- Papageorge, N.W., Zahn, M. V., Belot, M., van den Broek-Altenburg, E., Choi, S., Jamison, J.C., & Tripodi, E. 2020. Socio-demographic factors associated with self-protecting behavior during the COVID-19 pandemic. *IZA Institute of Labor Economics*.
- Rao, J.N.K., W. Yung, and M.A. Hidirolou. 2002. Estimating equations for the analysis of survey data using poststratification information. *Sankhya 64 Series A Part 2*: 364–378.
- RIVM. 2020. *COVID-19 karakteristieken per casus landelijk*. Retrieved December 15, 2020, from <https://data.rivm.nl/geonetwork/srv/dut/catalog.search#/metadata/2c4357c8-76e4-4662-9574-1deb8a73f724?tab=contact>
- Schmitt-Grohé, S., Teoh, K., Uribe, M. 2020. COVID-19: testing inequality in New York City. National Bureau of Economic Research Working Paper Series. No. 27019.
- Stabile, M., Apouey, B., & Solai, I. (2020). COVID-19, inequality, and gig economy workers. *Vox EU*. Retrieved October 21st, 2020 from <https://voxeu.org/article/COVID-19-inequality-and-gig-economy-workers>
- Valliant, R. 1993. Post-stratification and conditional variance estimation. *JASA* 88: 89–96.
- Van Bavel, J.J., K. Baicker, P.S. Boggio, V. Capraro, A. Cichocka, M. Cikara, and ...Willer, R. 2020. Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour* 4: 460–471.
- Van Bavel, J.J., A. Cichocka, V. Capraro, H. Sjästad, J.B. Nezlek, T. Pavlović, et al. 2022. National identity predicts public health support during a global pandemic. *Nature Communications* 13 (1): 1–14.
- van Prooijen, J.-W., T.W. Etienne, Y. Kutiyski, and A.P.M. Krouwel. 2021. Conspiracybeliefs prospectively predict health behavior and well-being during a pandemic. *Psychological Medicine*. <https://doi.org/10.1017/S0033291721004438>.
- van Prooijen, J.-W., and A. Krouwel. 2019. Psychological features of extreme political ideologies. *Current Directions in Psychological Science* 28 (2): 159–163.
- von Gaudecker, H.-M., Holler, R., Janyas, L., Siflinger, B., & Zimpelmann, C. (2020). *Labour supply in the early stages of the COVID-19 pandemic: Empirical evidence on hours, home office, and expectations* (Discussion paper 13158). IZA Institute of Labor Economics.



- Weill, J.A., M. Stigler, O. Deschenes, and M.R. Springborn. 2020. Social distancing responses to COVID-19 emergency declarations strongly differentiated by income. *PNAS* 11: 19658–19660.
- Witt, J.K. 2019. Graph construction. *Meta-Psychology*. <https://doi.org/10.15626/mp.2018.895>.
- Xie, W., S. Campbell, and W. Zhang. 2020. Working memory capacity predicts individual differences in social-distancing compliance during the COVID-19 pandemic in the United States. *PNAS* 117 (30): 17667–17674. <https://doi.org/10.1073/pnas.2008868117>.
- Zwicker, M.V., J.W. van Prooijen, and A. Krouwel. 2020. Persistent beliefs: Political extremism predicts ideological stability over time. *Group Processes and Intergroup Relations* 23 (8): 1137–1149. <https://doi.org/10.1177/1368430220917753>.

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