International Journal Of Public Opinion Research, **37**, edaf054
https://doi.org/10.1093/ijpor/edaf054
Advance access publication 30 September 2025
Research Note

Populism, Community-Based Inequalities, and Public Health Policies: How Did Populist Attitudes Determine the COVID-19 Preventive Policy Support in Different Local Socioeconomic and Health Contexts?

Tomoko Okada,[1] Liwei Shen,[2] Porismita Borah,[3] and Sijia Yang[4]

[1]WZB Berlin Social Science Center, Berlin, Germany
[2]Department of Communication Arts, University of Wisconsin-Madison, USA
[3]Edward R. Murrow College of Communication, Washington State University, USA
[4]School of Journalism and Mass Communication, University of Wisconsin-Madison, USA

All correspondence concerning this article should be addressed to Tomoko Okada, WZB Berlin Social Science Center, Reichpietschufer 50, Berlin 10785, Germany.
E-mail: tomoko.okada@wzb.eu

Abstract

Regardless of country, populist attitudes can better explain voting behavior and attitude formation toward social issues than party identification and political ideology. Nonetheless, despite the increased attention to rural/urban divides and diverse living experiences in each community, it has not been sufficiently uncovered how contextual factors, including local socioeconomic and health disparities, can moderate the roles of populist attitudes. Based on these findings, we explore (1) the roles of red and blue media use and populist attitudes in predicting support for preventive policies and (2) the moderation effects of local socioeconomic and health disparities in such associations. By analyzing online survey data from US adults ($N = 1{,}700$) conducted amid the COVID-19 pandemic, we demonstrate that blue media use was significantly associated with preventive policy support but not moderated by any socioeconomic and health disparities examined in this research. Meanwhile, red media use was significantly moderated by the Democrat vote share. Moreover, the 2 subdimensions of populist attitudes—anti-elitism and Manichaean outlook—were significantly moderated by community-based socioeconomic disparities, namely the cumulative COVID-19 infection rates and population size change in 2016–2020. We discuss these results and highlight the significance of exploring local and international contextual factors in studying populism.

The global rise of populism has spurred scholarly debates over the roles and implications of populist attitudes for democratic institutions, trust in science, and policy. Specifically, studies in public health show that populist attitudes play a notable role, even after controlling for political ideology and partisanship. Evidence shows a significant link between populist attitudes/votes and lower adherence to scientific advice regarding pandemic-era vaccine uptake (Kennedy, 2019), mask-wearing (Merkley & Loewen, 2021), and compliance-related attitudes and behaviors (Ehrke, Grommisch, Busch, & Kaczmarek, 2023). To promote public health, we must deepen our understanding of populist attitudes beyond the traditional right/left political spectrum.

For this reason, it is particularly crucial to examine how the roles of populist attitudes can be simultaneously determined by local health and socioeconomic conditions, as well as individuals' red/blue media use. Like populist attitudes, red media use correlated with lower compliance with health guidelines during the pandemic (Gollwitzer et al., 2020). As these factors are often concurrent and interwoven, they must be disentangled for effective and targeted interventions. Nonetheless, a key research gap remains regarding how community-level socioeconomic and health disparities shape the influence of red/blue media use and populist attitudes.

Due to the increased relevance of place-based identity (Munis, 2022), contextual factors in the place of residence—such as local socioeconomic and health conditions—can structure perceptions as the basis of "lived experience," moderate media effects, and influence political attitudes (Suk et al., 2020; Wells et al., 2021). We conducted an online survey with an approximately nationally representative sample of U.S. adults during the COVID-19 crisis. Using Hierarchical Linear Modeling (HLM), we examine how county-level variables—political leaning, population size change, bachelor's degree holders share, and health conditions (COVID-19 infection rates)—interacted with individual red/blue media use and populist attitudes in shaping public health policy support. Also, based on the inconsistent cross-level interactions of the subdimensions of populist attitudes (people-centrism, anti-elitism, and Manichaean outlook) and local contextual factors, we discuss the complexities of conceptualizing and operationalizing populist attitudes.

Populist Attitudes, Red/Blue Media use, and Public Health

Increased economic, cultural, and identity insecurities have fueled populism worldwide and made it unignorable

(Noury & Roland, 2020; Rodrik, 2021). Populist attitudes are often defined as a "thin-centered ideology" (Wirth et al., 2016)—a set of views on a moral conflict between a virtuous "people" and a corrupt political elite (Geurkink, Zaslove, Sluiter, & Jacobs, 2020). The impact of populist attitudes has been growing as they geographically spread, affecting attitude formation and behavior and even transcending traditional left–right political ideology (Uscinski et al., 2021).

Public health is no exception. Even after considering political ideology or partisanship, populist attitudes have been linked to lower acceptance of pandemic-era scientific advice and preventive health behaviors, such as vaccine uptake (Kennedy, 2019), mask-wearing (Merkley & Loewen, 2021), and compliance-related attitudes and behaviors (Ehrke et al., 2023). These findings point to the broader role of populist attitudes in shaping how individuals respond to collective health crises.

However, some challenges exist due to conceptual overlap between populism and other orientations such as conservatism or authoritarianism (Hunger & Paxton, 2022). Notably, U.S. populism has become increasingly entangled with support for Trump, anti-intellectualism (Inglehart & Norris, 2016), and red media use, making it difficult to disentangle populist attitudes as the independent driver of public health policy support. To address this, we model populist attitudes as a latent construct with three components: anti-elitism, support for popular sovereignty, and belief in the moral unity of the people (Schulz et al., 2018; Wirth et al., 2016). This multidimensional approach enables us to identify the nuanced implications of populist attitudes on public health attitudes.

In the highly polarized USA, partisan media use adds another layer of complexity when examining the role of populist attitudes in the realm of public health. Partisanship strongly links with media exposure and therefore influences political cognition and behavior (Stroud, 2011). Like populist attitudes, red media use was negatively associated with compliance-related preventive attitudes and science-based behaviors during the pandemic (Gollwitzer et al., 2020) because virus-related risks were downplayed in red media (Borah, Ghosh, Hwang, Shah, & Brauer, 2023). In contrast, blue media use was associated with greater trust in public health institutions and stronger adherence to preventive behaviors (Chung & Jones-Jang, 2022). Given these concurrent impacts of populism and partisan media use on preventive attitudes and behaviors, we must disentangle the roles of these intertwined but distinct factors to tackle them separately and strategically.

Local socioeconomic and health disparities as the contextual moderators

Besides individual-level factors, we cannot overlook local socioeconomic and health conditions—contextual factors that define the "lived experience" and thereby shape the sense of "imagined community" (Suk et al., 2020). Today, place-based social identity has become increasingly salient (Munis, 2022), with rural identity now serving as a decisive factor in shaping voting behavior and values (Cramer, 2016; Lunz Trujillo, 2022). Furthermore, local socioeconomic and health conditions influence how individuals interpret political messages and media cues as moderators.

In counties experiencing economic and health disadvantages—such as population decline and poor health status, residents evaluated politicians less consistently with their party identification (Suk et al., 2020). Likewise, Okada and Shen (2023) found that red media use was significantly associated with lower trust toward scientists in rural areas during the pandemic but not in 2016, suggesting that contextual vulnerabilities can intensify the effects of media use. These findings warrant an examination of why and which aspects of place-based disparities moderate the roles of political predispositions (i.e., populist attitudes) and media use in shaping public health attitudes.

Therefore, we examine the following four variables at the county level as the objective measures of local socioeconomic and health conditions. First, the *Democrat vote share* serves as a proxy for local political leanings, which define the administrative community and affect the actual practice of preventive behaviors (Borah et al., 2023) and public health policies. Second, the *share of residents with a bachelor's degree* captures the community's access to higher education, which is linked to the collective public understanding of science and trust in expert knowledge. Third, *population change* reflects socioeconomic vitality or decline, which has been found to significantly moderate the roles of partisanship (Suk et al., 2020) and populist attitudes (Arzheimer et al., 2024). Unlike the unemployment rate, whose impact was distorted by pandemic-era subsidies, population trends offer a rigorous and longer-term indicator of structural stability or decline (Spadafora, 2023). Finally, *cumulative COVID-19 infection rates* capture community-level exposure to public health threats, which may alter collective risk perception and responsiveness to policy (Rattay et al., 2021) as well as perceived collective health status, the driver of populism (Oude Groeniger, Gugushvili, de Koster, & van der Waal, 2022).

Together, these contextual variables reflect local social, cultural, economic, and health threats, respectively. Exploring these variables can illuminate how community-level "lived experiences" moderate the distinct roles of media use and populist attitudes in public health policy support in detail. Given the role of spatiality in infectious diseases, including COVID-19, it is crucial to examine such moderation effects based on the place of residence. Drawing on these previous findings and needs, we address the following RQs.

RQ1: How was red/blue media use associated with preventive COVID-19 policies?
RQ2: How did local socioeconomic and health disparities moderate the association between red/blue media use and preventive COVID-19 policies?
RQ3: How were populist attitudes associated with preventive COVID-19 policies?
RQ4: How did local socioeconomic and health disparities moderate the association of populist attitudes and preventive COVID-19 policies?

Methods

Data

Using Qualtrics' online survey panel, which approximates the U.S. national demographic distribution, we contacted 3,575 U.S. adults from February to March 2022. Except for the rural residents (32.4%), which we oversampled due to the impacts of COVID-19 on rural America, the 1,700 respondents who completed the survey and included in the following analyses

were similar to the nationally representative samples (Appendix A).

Measurements

First-level (individual-level) variables

Support for the COVID-19 prevention policies. This variable served as the dependent variable for this study. Respondents indicated to what extent they supported the seven items of government measures to limit the spread of COVID-19 using 5-point scales (1 = *Totally do not support* to 5 = *Totally support*; see Appendix B). After checking the reliability (α = 0.88), we averaged these items to create an overall measure of support for the COVID-19 prevention policies ($M = 3.15$, $SD = 1.08$).

Red/blue media use. Respondents answered about their media use on the 5-point scales (1 = *never* to 5 = *multiple times a day*). In particular, we measured *Red Media Use* by averaging respondents' use of "The FOX News cable news channel, website or app from the Fox News cable news organization," "Conservative Talk Radio website or app from conservative talk radio (e.g., The Rush Limbaugh Show)," and "Conservative online sources (including The American Spectator, Breitbart, The Daily Caller, or The Daily Mail)" ($\omega = 0.80$, $M = 1.90$, $SD = 1.09$).

Blue Media Use was assessed by averaging respondents' use of "The CNN news channel, website, or app from the CNN cable news channel," "The MSNBC cable news channel, website or app from the MSNBC cable news organization," and "Liberal online sources (e.g., Democracy Now, The Intercept, Mother Jones, or Vox)" ($\omega = 0.79$, $M = 1.99$, SD = 1.12, see also Appendix E for the confirmatory factor analysis [CFA] results).

Populist attitudes. Following the conceptualization and measurements proposed by Castanho Silva et al. (2018), we assessed populist attitudes (i.e., people-centrism, anti-elitism, and Manichaean outlook) and kept these subdimensions separate, given the role of each component uniquely contributed to the public discourse toward politicians (e.g., Jungherr, Posegga, & An, 2022). Each subdimension of populist attitudes was measured by three items with the 5-point scales (1 = *Strongly Disagree* to 5 = *Strongly Agree*), respectively.

Based on the results of the CFA, we dropped the items with factor loadings lower than 0.4 and created the measures for people-centrism ($M = 4.22$, $SD = 0.77$), anti-elitism (M = 3.80, $SD = 0.90$), and Manichaean outlook ($M = 2.77$, $SD = 0.90$) by averaging the two question items for each and included them in our analysis (see Appendix C and D for the CFA results and the question items).

Control variables. Demographic variables, such as *gender*, *age*, *education*, and *family income*, were used for control purposes. Also, we included the level of rurality measured using the 2013 Rural-Urban Continuum Codes (U.S. Department of Agriculture, Economic Research Service, 2013).

Second-level (county-level) variables

County-level political leaning (Democrat vote shares for the 2020 presidential election). Given that acceptance of recommended COVID-19 preventive behaviors was significantly associated with greater support for Trump (Gonzalez, James, Bjorklund, & Hill, 2021), we employed *Democrat vote shares for the 2020 presidential election* (MIT Election Data and Science Lab, 2018) as one of the contextual factors in this study, serving as an indicator of county-level political leaning ($M = 49.51$, $SD = 9.12$).

Socioeconomic inequalities between counties: population size change 2016–2020 and share of bachelor's degree holders. Following Suk et al. (2020), we assessed the social and economic inequalities as an index of relative deprivation between counties. Specifically, *population size change* (M = 5706.43, $SD = 51075.2$) in 2016–2020 and *the share of bachelor's degree holders* in 2020 were included in the following models of this study. These statistics were derived from the 5-year estimates provided by the 2016 and 2020 American Community Survey (U.S. Census Bureau, 2021, 2022). *Population size change* demonstrates the growth of each county, and the percentage of bachelor's degree holders can capture psychological distance from higher education and elites in general: the feasibility to obtain and access to higher education. This variable was measured by the percentage of population whose age is 25 years and over 25 years holding bachelor's degree in each county ($M = 20.34$, $SD = 9.08$).

Health disparities between counties (cumulative COVID-19 infection rates [%]). By using the data collected by the Johns Hopkins University Coronavirus Resource Center (Dong, Du, & Gardner, 2020), we calculated the cumulative COVID-19 infection rate until the date of completion of data collection. In particular, we summed the confirmed cases and divided them by the county-level population size ($M = 8.71$, $SD = 2.71$).

Data analysis

To examine our RQs, we conducted a series of HLMs.[1] When employing the empty model, the model fit improved significantly compared to the counterpart model at a single level ($\overline{\chi^2} = 16.37$, $p < .001$). The value of the intraclass correlation, the degree of association among observations within the same county, of overall support toward preventive measures against COVID-19 was 0.09 (95% CI [0.05, 0.17]). Approximately 9.36% of overall COVID-19 preventive policy attitudes were attributable to county-level differences, which supports the decision to use HLM. Therefore, starting from this simple random intercept model with only fixed effects, we tested HLM with more complex components (i.e., cross-level interactions) in our final model.

Results

First, we looked at the associations between red/blue media use and the support for the COVID-19 prevention policies (RQ1), and potential moderation effects by local political and socioeconomic health contexts in each county (RQ2), such as county-level political leaning (i.e., the Democrat vote share in the 2020 presidential election), population size

[1] Supplementary materials include additional analyses incorporating interaction terms between party ID and red/blue media use, and between party ID and populist attitudes, as suggested by reviewers.

Table 1. Multi-Level Analysis Predicting COVID-19 Preventive Policy Support

Predictors		
Gender (1 = *Female*)	0.09	(0.07)
Age	0.0001	(0.002)
Family income	0.002	(0.01)
Education	0.04	(0.03)
Party ID (5 = *Strong Democrat*)	0.20***	(0.03)
Red media use	−0.17***	(0.03)
Blue media use	0.28***	(0.03)
People centrism	0.05	(0.03)
Anti-elitism	−0.03	(0.03)
Manichaean outlook	0.03	(0.03)
Explained variances	11.56% (**fixed effects** only), 33.30% (fixed & random effects)	
County-level variables		
Rurality	−0.09**	(0.04)
Democrat vote share (%)	0.18***	(0.05)
Bachelor's degree holders share (%)	−0.01	(0.04)
Population size change	0.03	(0.04)
Cumulative COVID-19 infection rates (%)	0.05	(0.03)
Explained variances	16.55% (**fixed effects** only), 30.75% (fixed and random effects)	
Two-way cross-level interactions		
Red Media Use * Democrat Vote Share	0.08*	(0.04)
Red Media Use * Bachelor's Degree Holders Share	0.0003	(0.04)
Red Media Use * Population Size Change	0.01	(0.02)
Red Media Use * Cumulative COVID-19 Infection Rates	0.03	(0.03)
Blue Media Use * Democrat Vote Share	−0.03	(0.05)
Blue Media Use * Bachelor's Degree Holders Share	−0.02	(0.04)
Blue Media Use * Population Size Change	−0.01	(0.02)
Blue Media Use * Cumulative COVID-19 Infection Rates	−0.03	(0.03)
People-Centrism * Democrat Vote Share	−0.02	(0.04)
People-Centrism * Bachelor's Degree Holders Share	−0.02	(0.04)
People-Centrism * Population Size Change	−0.002	(0.02)
People Centrism * Cumulative COVID-19 Infection Rates	−0.03	(0.03)
Anti-Elitism * Democrat Vote Share	−0.02	(0.04)
Anti-Elitism * Bachelor's Degree Holders Share	0.04	(0.04)
Anti-Elitism * Population Size Change	0.02	(0.02)
Anti-Elitism * Cumulative COVID-19 Infection Rates	0.07**	(0.03)
Manichaean Outlook * Democrat Vote Share	0.01	(0.04)
Manichaean Outlook * Bachelor's Degree Holders Share	−0.01	(0.04)
Manichaean Outlook * Population Size Change	−0.04**	(0.02)
Manichaean Outlook * Cumulative COVID-19 Infection Rates	0.02	(0.02)
Total explained variances	17.75% (**fixed effects** only), 34.12% (fixed and random effects)	
N	1,622	

Note. Standard errors in parentheses. *$p < .05$, **$p < .01$, ***$p < .001$. N(county) = 952.

change in 2016–2020, public health status regarding COVID-19 (cumulative COVID-19 infection rates, and the share of bachelors' degree holders.) As we can see in Table 1, in RQ2, only the interaction of red media use and Democrat vote share was significant ($b = 0.09$, 95% CI [0.0004, 0.17], $p = .049$); meanwhile, in RQ1, blue media use was significant in predicting overall support for the COVID-19 prevention policies ($b = 0.28$, 95% CI [0.21, 0.35], $p < .001$.) Hence, as Figure 1 indicates, a higher Democrat vote share was associated with higher predicted values of COVID-19 policy support, and the increase was more pronounced among those with high red media use.

Next, RQ3 examines the associations of populist attitudes (i.e., people-centrism, anti-elitism, and the Manichaean

outlook) and the overall support toward the COVID-19 prevention policies, as well as the moderation effects (RQ4) of the aforementioned contextual factors. Two significant cross-level interactions were found in testing RQ4; the interaction of anti-elitism and the cumulative COVID-19 infection case rate ($b = 0.07$, 95% CI [0.02, 0.12], $p = .012$) and the one of the Manichaean outlook and the population size change in 2016–2020 ($b = -0.04$, 95% CI [−0.08, −0.01], $p = .025$). In RQ3, people centrism was not significant both as a main effect and as an interaction term.

Figure 2 indicates the values of the overall support for the COVID-19 prevention policies predicted by these significant cross-level interaction terms. As shown in Figure 2 (left), in the counties with higher cumulative COVID-19 infection rates, people with higher anti-elitism attitude scores supported the COVID-19 prevention policies more strongly than their counterparts in the counties with lower cumulative COVID-19 infection rates. Meanwhile, among people with low anti-elitism scores, overall support for the COVID-19 prevention policies remains nearly unchanged regardless of the county-level cumulative COVID-19 infection rates. Generally, the increase in the cumulative COVID-19 infection rates was linked to reduced differences between citizens with high and low anti-elitism.

Such a convergence was also seen in Figure 2 (right), which shows the predicted values of the overall support for the COVID-19 prevention policies by the cross-level interaction term of Manichaean outlook and population size change in 2016–2020. Nonetheless, their implications drawn from Figure 2 (right) were dissimilar from the interaction plots we showed in Figure 2 (left) for the values of the support for the COVID-19 prevention policies predicted by the cross-level interaction of anti-elitism and the cumulative COVID-19 infection rate. In the counties where their socioeconomic situations improved (i.e., population size change in 2016–2020), lower populist attitudes (i.e., low Manichaean outlook group) showed a higher level of overall support for the COVID-19 prevention policies than those in counties that experienced decreased population size change in 2016–2020. On the other hand, among those whose Manichaean outlook scores were high, the overall support for the COVID-19 prevention policies did not change significantly, regardless of the population size change in 2016–2020.

In sum, the cross-level interactions of the two subdimensions of populist attitudes and county-level socioeconomic (i.e., population size change in 2016–2020) and health disparities (i.e., the cumulative COVID-19 infection rate) led to smaller differences between those who have high and low populist attitudes in predicting the overall support for the COVID-19 prevention policies. In addition to the cross-level interactions and main effects explored in our RQs, rurality ($b = -0.09$, 95% CI [−0.16, −0.02], $p = .011$) and partisanship ($b = 0.20$, 95% CI [0.14, 0.27], $p < .001$) were significant, even after controlling for the county-level socioeconomic and health disparities examined in this study.

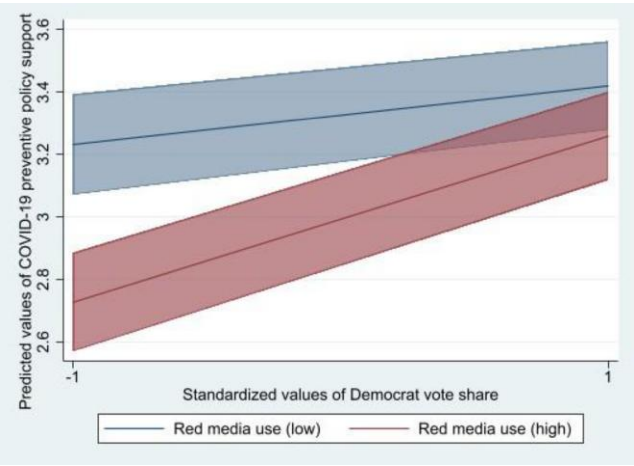

Figure 1. Predicted Values of the Overall COVID-19 Prevention Policy Support by Interaction Terms of Red Media Use and County-Level Democrat Vote Share. *Note*: County-level Democrat vote share was centered at its mean (grand-mean centered), and red media use was centered at the county-level mean (group-mean centered).

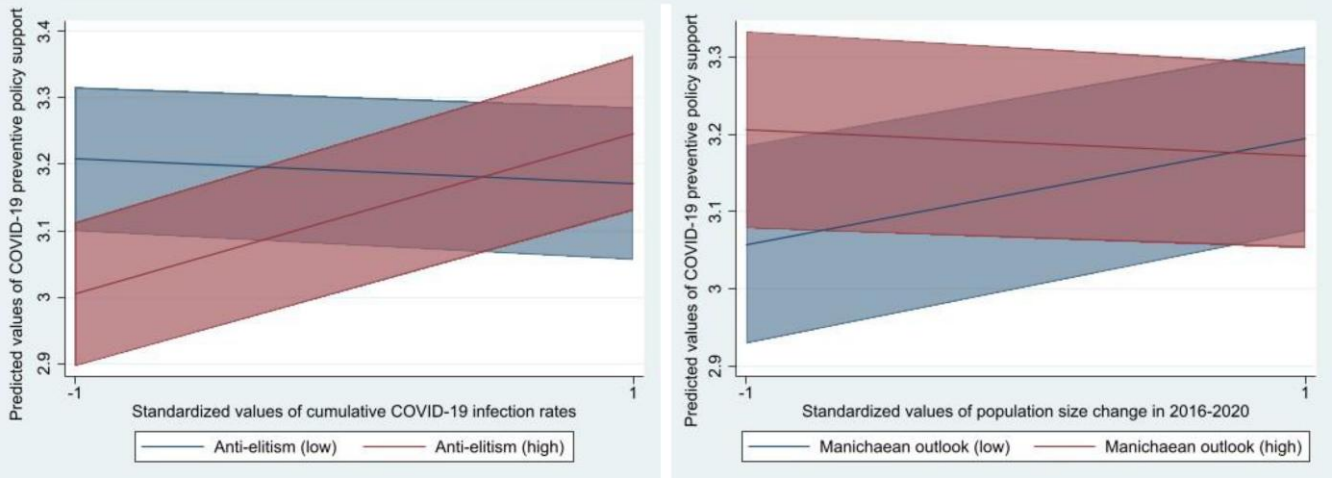

Figure 2. Predicted values of the overall COVID-19 prevention policy support by interaction terms of 1) Manichaean outlook and population change in 2016–2020 (right) and 2) Anti-Elitism and the County-Level Cumulative COVID-19 Infection Rates (%) (left). *Note.* Population size change was centered at its mean (grand-mean centered) and Manichaean outlook was centered at county-level mean (group-mean centered). Also, the County-level Cumulative COVID-19 Infection Rates were centered at its mean (grand-mean centered) and anti-elitism was centered at county-level mean (group-mean centered).

Discussion

Considering the global rise of populism and rural-urban divides in values, this study explored the roles of red/blue media use and populist attitudes in predicting support for public health policies under the COVID-19 pandemic, focusing on the following county-level local socioeconomic and health disparities as the moderators of these associations: (1) political leaning, (2) population size change, (3) the share of bachelor's degree holders, and (4) cumulative COVID-19 infection rates.

Regarding RQs 1 and 2, we found significant main effects of blue media use and the interaction of red media use and the county-level Democrat vote share in predicting COVID-19 prevention policy support. Individuals exposed to more blue media exhibited increased support for COVID-19 prevention policies. Meanwhile, a higher Democrat vote share was positively correlated with COVID-19 prevention policy support, regardless of red media use. This effect was most prominent among high-red media users. Given that we live in a media environment characterized by extensive choice over the information we are exposed to, it is noteworthy that only red media use was significantly moderated by a local contextual effect.

In examining RQs 3 and 4, we found that only two of the subdimensions of populist attitudes—anti-elitism and Manichaean outlook—were significantly moderated by community-based socioeconomic disparities, namely the cumulative COVID-19 infection rates and population size change in 2016–2020, respectively. People-centrism yielded no significant associations in predicting overall support for the COVID-19 prevention policies. When anti-elitism intersected with higher COVID-19 infection rates, it was associated with increased policy support. Manichaean outlook, coupled with population-size change, negatively influenced policy support. Moreover, rurality and party ID were significant predictors.

These results highlight the critical roles of the local contextual factors that can direct the roles of populist attitudes. Interestingly, higher populist attitudes and worse local conditions were not necessarily correlated with lower COVID-19 prevention policy support. Furthermore, we found very dissimilar cross-level interactions for the three subdimensions of populist attitudes by interacting them with different community-based contextual factors (in the case of anti-elitism and Manichaean outlook) and nonsignificant results for people-centrism. Such discrepancies warrant more systematic and comprehensive understanding of populist attitudes to improve the conceptualization and operationalization (Hunger & Paxton, 2022).

Overlaps and interactions exist with host ideologies such as conservatism and authoritarianism, as well as with dissimilar expressions of populism across geographies (Paxton, 2022). We show that the associations between the subdimensions of populist attitudes and public health policy support are contingent on geographical factors, even after controlling for partisanship and red/blue media use, which meant that we could largely control for liberal and conservative ideologies. Research focusing on the moderation effects of local socioeconomic factors can indicate why and how the consequences of populism may differ across regions and countries.

It is also crucial to scrutinize whether and to what extent our findings drawn from studying American adults can apply to other contexts. Especially since the Great Recession in 2008, populism has grown in power globally, driven by globalization-induced economic, cultural, and identity insecurities (Noury & Roland, 2020; Rodrik, 2021). Despite varied responses to the pandemic among populist leaders, they all tended to undermine scientific legitimacy (Zulianello & Guasti, 2023). Considering this commonly observed denial of science, comparative analyses are necessary to further test the generalizability of our findings.

Next, it is worth noting some limitations of this study. There is no consensus on how to conceptualize and operationalize populist attitudes, and different measures of populist attitudes may yield different outcomes. Specifically, given the limited number of items we used to measure populist attitudes with marginal fit in the CFA, relatively low power (Appendix F), and explained variances in our HLM, future research should examine the RQs with more items and respondents to capture populist attitudes and interactions more accurately and comprehensively. Finally, causal inferences in this study are limited by the cross-sectional survey data.

Despite these limitations, this study provides the following implications for practitioners. Blue media use is consistently linked to greater COVID-19 prevention policy support, suggesting that communication strategies should address political polarization by media use to receive widespread support for public health policies, regardless of the political leaning of counties. Meanwhile, the impacts of populist attitudes and red media use on public-health policy support are dependent on community-based socioeconomic factors. Nuanced, geographically based approaches are crucial for boosting support for public health policies at a time of polarization driven by populist attitudes and media use.

Acknowledgments

I thank the anonymous reviewers for their valuable feedback, which greatly improved this manuscript. I am also grateful to Dr Sharon Dunwoody for inspiring the idea behind this research and to our funders for their generous support.

Supplementary data

Supplementary data is available at *IJPOR* online

Funding

Support for this research was provided by the University of Wisconsin-Madison Office of the Vice Chancellor for Research and Graduate Education, with funding from the Wisconsin Alumni Research Foundation (#MSN231886). Additional support was provided by Poynter, the International Fact-Checking Network, and the CoronaVirusFacts Alliance (#MSN242007).

Biographical Notes

Tomoko Okada (Ph.D., University of Wisconsin-Madison) is a postdoctoral researcher at the WZB (Berlin Social Science Center). Her research interests are located at the intersection of science communication and political communication. In particular, her research focuses on the public opinion, public discourse on (social) media, and information dissemination, and on the application and integration of large-scale digital trace data and survey data using methods in computational social sciences.

Liwei Shen (M.A.) is a Ph.D. student at the University of Wisconsin-Madison, having received her undergraduate degree at the University of Michigan, Ann Arbor, and her Master's degree at the University of Wisconsin-Madison. Her research has been focused on the socio-political and cognitive accounts of belief in misinformation and conspiracy theories, and on developing relevant interventions.

Porismita Borah (Ph.D., University of Wisconsin-Madison) is a Professor at the Edward R. Murrow College of Communication. Borah primarily studies discourses on digital platforms as well as message effects in the context of both politics and health. Twitter: @borah. Web: http://porismitaborah.com/.

Sijia Yang (Ph.D., University of Pennsylvania) is an assistant professor in the School of Journalism and Mass Communication at the University of Wisconsin-Madison. He studies message effects, health communication, persuasion on digital media, and computational social science.

Appendix

A. Descriptive statistics of the samples in our study

As shown in the descriptive statistics below, our samples did not significantly differ from nationally representative samples from the American National Election Studies (ANES) 2020 regarding their basic demographics, except that we oversampled from rural areas. Maybe due to this oversampled population, the samples of our respondents were a bit older and had lower family income, with a larger proportion of male populations.

ANES 2020		Our survey (2021)	
Gender		**Gender**	
Male 45.82%, female 54.18%		Male 49.15%, female 50.85%	
Age		**Age**	
Mean = 51.59, SD = 17.20		Mean = 55.66 SD = 16.76	
Medium family income		**Median family income**	
$60,000–64,999		$50,000 to $59,999	
Education		**Education**	
Less than high school credential	4.61%	Less than high school credential	2.59%
High school credential	16.39%	High school graduate credential	22.06%
Some post-high school, no bachelor's	34.24%	Some college but no degree	22.35%
Bachelor's degree	25.22%	Associate degree in college	12.53%
Graduate degree	19.54%	Bachelor's degree	24.18%
		Graduate degree	16.29%

B. Support for the COVID-19 prevention policies

We used the following seven items to assess the support for government measures to limit the spread of COVID-19 with the following 5-point scales (1 = *Totally do not support* to 5 = *Totally support*)

1. Calling in the military to build a field hospital for COVID-19 patients
2. Using empty hotels to house the homeless
3. Stricter physical-distancing measures enforced by legislation
4. Large fines for people breaking physical-distancing laws or regulations
5. Running whatever size federal deficit the president says is necessary to get the U.S. through this crisis
6. Limits on my personal movement (e.g., laws restricting who can leave their home)
7. The federal government using cellphones to monitor the movement of Americans who are supposed to be quarantined in mandatory self-isolation.

C. Populist attitudes

Below, we list the question items used to measure populist attitudes in this study. These questions were drawn from Castanho Silva et al. (2018).

To what extent do you agree or disagree with the following statement?

People centrism

P-1, Politicians should always listen closely to the problems of the people.
P-2, Politicians don't have to spend time among ordinary people to do a good job. (reverse-coded)
P-3, The will of the people should be the highest principle in this country's politics.

Anti-elitism

A-1, The government is pretty much run by a few big interests looking out for themselves.
A-2, Government officials use their power to try to improve people's lives. (reverse-coded)
A-3, Quite a few of the people running the government are crooked.

Manichaean outlook

M-1, You can tell if a person is good or bad if you know their politics.
M-2, The people I disagree with politically are not evil. (reverse-coded)
M-3, The people I disagree with politically are just misinformed.

Note: reverse-coded questions from each subdimension of populist attitudes were removed to create the variables used in the HLM due to the low fitness of CFA below.

D. Results of the CFAs and Omega coefficients for the subdimensions of populist attitudes

First, we employed the scales in Castanho Silva et al. (2018) to measure the three dimensions of populist attitudes (people-centrism, anti-elitism, and Manichaean outlook). However,

these scales relied on a small number of items to measure these attitudes. Hence, we conducted a CFA using all nine items and verified the reliability of these populist-attitude items instead of employing Cronbach's alpha and omega (Flora, 2020). In Castanho Silva et al. (2018), populist attitudes were modeled as a second-order factor, with three proposed distinct subdimensions, and items were only permitted to load on the factors they were expected to load on. However, the outcomes of this CFA in Table D1 show that the model did not fit at the acceptable level (Chi-squared = 678.684, $df = 24$, $p < .001$; comparative fit index [CFI] = 0.723; root mean squared error of approximation [RMSEA] = 0.127; SRMR = 0.096). Moreover, some items did not reach factor loadings of 0.4 (see Table D2, i.e., P-2, A-2, and M-3 described in Table D2, Populist Attitudes in the previous section). These items demonstrate significant skewness and deviate from normal distributions, causing low fit of the CFA and factor loadings that were not consistent with the hypothesized structures in Castanho Silva et al. (2018).

Therefore, we dropped the items with factor loadings less than 0.4 and fit another CFA with the remaining items. The results of this second CFA model with the remaining items indicated an acceptable model fit (Table D1, Chi-squared = 38.98, $df = 6$, $p < .001$; CFI = 0.978; RMSEA = 0.057; SRMR = 0.031). They also provide evidence supporting the expected three subdimension structures and using the remaining six items to assess each subdimension of populist attitudes.

Consistent with the CFA results, the McDonald's Omega coefficient—a reliability measure that relaxes the tau-equivalence assumption of Cronbach's alpha—failed to converge for the people-centrism and Manichaean outlook subdimensions when all three items for these subdimensions of populist attitudes were included. For anti-elitism, the Omega coefficient was 0.64, thus falling below the commonly accepted threshold for adequate reliability (i.e., 0.70). These findings support our decision to drop the three items (P-2, A-2, and M-2) and to construct each subdimension of populist attitudes by summing the remaining two items.

E. Results of the CFA for checking the reliability of the red/blue media use variables

Follow-up analyses using CFA to assess the reliability of Red and Blue Media Use support the decision to treat them as distinct single-factor constructs, as shown in Table E2. However, the relatively marginal fit of the CFA model represents a limitation of this study, and although the omega coefficients reported in the main manuscript were sufficiently high, we recommend caution in interpreting these results and suggest that future studies further examine the reliability of these measures.

F. Results of power analyses for the cross-level interaction terms

In this study, we explored several cross-level interactions that may not be apparent because the analysis has low statistical

Table D1. Confirmatory Factor Analysis (CFA) Results of the Nine- and the Six-Item Populist Attitude Models

Fit statistics		
	9-item model	6-item model
Chi-squared	678.684	38.98
df	24	6
CFI	0.723	0.978
RMSEA	0.127	0.057
SRMR	0.096	0.031

Table E1. Confirmatory Factor Analysis (CFA) Results of Red/Blue Media Use: Fit Statistics

	Indices
Chi-squared	427.899
df	8
CFI	0.891
RMSEA	0.176

Table E2. Confirmatory Factor Analysis (CFA) Results for Red/Blue Media Use: Standardized Factor Loadings

Variables	Red media use	Blue media use
Fox News	0.62	
Conservative Radio	0.84	
Conservative Online Sources	0.80	
CNN		0.76
MSNBC		0.84
Liberal Online Sources		0.64

Table D2. Confirmatory Factor Analysis (CFA) Results of the Nine- and the Six-Item Populist Attitude Models: Standardized Factor Loadings

	9-item model			6-item model		
Items	People-centrism	Anti-elitism	Manichaean outlook	People-centrism	Anti-elitism	Manichaean outlook
P-1	0.71			0.64		
P-2	0.26					
P-3	0.61			0.70		
A-1		0.79			0.78	
A-2		0.31				
A-3		0.68			0.69	
M-1			0.77			0.46
M-2			0.32			
M-3			0.41			0.70

Table F1. Power Analysis for Interaction Terms in the Hierarchical Linear Model

Interaction terms	Effect size	Power (%)	95% CI for power	Remarks
Red Media Use * Democrat Vote Share	0.002*	51.64	(50.24, 53.03)	Moderate power but significant
Blue Media Use * Democrat Vote Share	0.0002	11.40	(10.53, 12.31)	Low power and not significant
People-Centrism * Democrat Vote Share	0.0001	8.48	(7.72, 9.29)	Low power and not significant
Anti-Elitism * Democrat Vote Share	0.0001	7.96	(7.22, 8.75)	Low power and not significant,
Manichaean Outlook * Democrat Vote Share	0.0001	6.94	(6.25, 7.68)	Low power and not significant,
Red Media Use * Bachelor's Degree Holders Share	0.0000001	5.16	(4.56, 5.81)	Low power and not significant
Blue Media Use * Bachelor's Degree Holders Share	0.0001	8.26	(7.51, 9.06)	Low power and not significant
People-Centrism * Bachelor's Degree Holders Share	0.0002	11.78	(10.90, 12.71)	Low power and not significant
Anti-Elitism * Bachelor's Degree Holders Share	0.0005	18.22	(17.16, 19.32)	Low power and not significant
Manichaean Outlook * Bachelor's Degree Holders Share	0.00004	6.30	(5.64, 7.01)	Low power and not significant
Red Media Use * Population Size Change	0.0001	7.46	(6.75, 8.22)	Low power but not significant
Blue Media Use * Population Size Change	0.00003	6.34	(5.68, 7.05)	Low power and not significant
People-Centrism * Population Size Change	0.00001	5.68	(5.05, 6.36)	Low power and not significant
Anti-Elitism * Population Size Change	0.0004	12.86	(11.94, 13.82)	Low power and not significant,
Manichaean Outlook * Population Size Change	0.002*	62.00	(60.64, 63.35)	Moderate power but significant, underscoring its robustness under challenging conditions.
Red Media Use * Cumulative COVID-19 Infection Rates	0.0004	16.20	(15.19, 17.25)	Moderate power but not significant
Blue Media Use * Cumulative COVID-19 Infection Rates		16.26	(15.25, 17.31)	Moderate power and not significant
People Centrism * Cumulative COVID-19 Infection Rates		2.84	(27.15, 29.67)	Low power and not significant
Anti-Elitism * Cumulative COVID-19 Infection Rates	*	71.94	(70.67, 73.18)	High power and significant, underscoring its importance in the observed data
Manichaean Outlook * Cumulative COVID-19 Infection Rates		9.98	(9.16, 10.84)	Low power and not significant

power to detect their significance. Hence, we conducted a series of power analyses.

The power analyses described below revealed relatively low statistical power for most interaction terms in the model, with many estimates well below the conventional threshold of 80%. This indicates the need for caution when interpreting the significance of these effects, as low power increases the likelihood of false negatives (Type II errors).

Given the complexity of the multilevel model and the relatively small number of respondents per cluster—1,622 individuals nested within 920 counties (an average of approximately 1.8 respondents per cluster)—we follow the guidance of Gelman and Hill (2006)and McNeish and Stapleton (2016) in interpreting power levels relative to model context. Specifically, we consider power estimates between 40% and 49% as indicative of moderate power, and those below 40% as low power. This approach reflects realistic expectations in applied social science research involving cross-level interactions, where effect sizes are often small and design-based constraints limit statistical power.

Despite these limitations, we detected several interaction terms as statistically significant. These noteworthy results include the following interaction terms: *Red Media Use* × *Democrat Vote Share*, *Anti-Elitism* × *Cumulative COVID Cases*, and *Manichaean Outlook* × *Population Size Change*. The fact that these interactions reached significance despite limited statistical power highlights the robustness of these effects and lends further support to their substantive relevance within the model.

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