



Regular Article

Media framing and trust: A randomized survey experiment on attitudes towards the unvaccinated during the COVID-19 pandemic

Aki Koivula ^{a,*}, Eetu Marttila ^{b,1}, Ilkka Koiranen ^b

^a INVEST Research Flagship Center, University of Turku, Finland

^b Department of Social Research, University of Turku, Finland

ARTICLE INFO

Keywords:

News media framing
 COVID-19 vaccination
 Survey experiment
 Trust in institutions
 Finland

ABSTRACT

This research examines the influence of news media and trust in institutions on how vaccinated individuals in Finland perceived the unvaccinated during the COVID-19 pandemic. The study employed a randomized survey experiment involving 455 participants and incorporated episodic and thematic news framings on vaccine side effects alongside a non-treatment control group. Episodic framing, which presented personal stories, was found to significantly reduce the inclination to impose additional restrictions on the unvaccinated and lessen the perception of them as an outgroup. The converse effect was shown in thematic framing, which focused on statistics and expert opinions. The study also underscored the pivotal role of trust in institutions: lower trust increases the influence of episodic framing, while strong political trust can mitigate the effects of news framing. This investigation provides vital insights into the interplay between media framing and trust levels in shaping public attitudes towards health risks and non-adherence during a health emergency.

1. Introduction

This study examines the complex balance faced by liberal democracies during the COVID-19 pandemic, in particular, the harmonization of public health demands and the preservation of civil liberties (Engler et al., 2021). A key issue in this balancing act involved the rights of the unvaccinated, an issue that quickly became a social divide, escalating inter-group tensions and societal polarization (Graso et al., 2023). Research has confirmed a growing trend of moral condemnation towards those who opted out of vaccination and a public inclination towards accepting unequal treatment of the unvaccinated (Bor et al., 2022; 2023; Schuessler et al., 2022).

We complement this discourse by examining the role of news media in shaping public perception, a widely studied phenomenon in the academic literature (Bolsen & Shapiro, 2018; Boukes, 2022; Han & Federico, 2018; Valkenburg et al., 2016). News framing, in particular, has been shown to significantly influence public attitudes, perceived trust and behaviours (Chong & Druckman, 2007; de Vreese, 2005; Iyengar, 1996; Pan & Meng, 2016). In the context of societal disruptions, such as the COVID-19 crisis, the impact of communication dynamics has become even more pronounced (An & Gower, 2009; Vettenranta, 2015; Vigsø &

Odén, 2016).

Our study focuses on two types of news frames—episodic and thematic—and their influence on public attitudes towards the unvaccinated during the pandemic (Boyer et al., 2022; D'Angelo, 2017). Furthermore, we examine how individual differences, especially in relation to trust in institutions, moderate the impact of news framing (Devine et al., 2023; Nabi, 2003; Slothuus & De Vreese, 2010). The study focuses on moral condemnation towards citizens who refused vaccination with the aim of providing new theoretical insights into how trust in institutions can moderate the influence of media framing on public attitudes towards policies that affect civil liberties during health crises. In addition to the moderating effect of news framing, trust in institutions is crucial because of its prominent role during COVID-19 in shaping opinions and support for public policies as well as its correlation with better crisis management (Devine et al., 2023; Hetherington & Rudolph, 2022; Keskilä-Kekkonen et al., 2022).

* Corresponding author.

E-mail address: akjeko@utu.fi (A. Koivula).

¹ Koivula and Marttila contributed equally to this work.

2. Literature review

2.1. News framing and attitudes towards the unvaccinated

In the study of public attitudes during the COVID-19 pandemic, a notable focus has been the division of people into vaccinated and unvaccinated groups, fostering inter-group tensions and polarized views (Allington et al., 2023; Bor et al., 2023; Prosser et al., 2020; Schuessler et al., 2022; Ye et al., 2023). Research from Denmark and the United States shows the vaccinated often favoured stricter measures against the unvaccinated (Bor et al., 2023; Schuessler et al., 2022). This trend aligns with social tendencies to disapprove of those who do not adhere to collective norms during times of crisis (Bor et al., 2022; Fehr & Fischbacher, 2004; Hensel et al., 2022). We focus here on how news framing can influence such attitudes. News framing, that is, the way in which news media select, emphasize and present certain aspects of issues, impacts audience opinions and policy views by influencing the salience, relevance and the interpretation of information (Chong & Druckman, 2007; Lecheler & De Vreese, 2019; Nelson & Kinder, 1997; Scheufele, 1999; Scheufele & Tewksbury, 2007), highlighting its role in moulding public attitudes during health crises.

Previous studies have examined the relationship between news framing and different political attitudes (Entman & Rojecki, 1993; Iyengar, 1996; Nelson et al., 1997; Price et al., 1997). For example, Nelson et al. (1997) demonstrated the direct effect of the media framing of a civil liberties conflict involving individuals' tolerance of controversial policies. Similarly, Price et al. (1997) showed that different news frames elicited distinct cognitive responses from readers. Moreover, the media's framing of political issues shapes public deliberation and curbs elite influence (Druckman & Nelson, 2003). This rich body of research encompasses various domains, including attitudes about immigration (Bos et al., 2016), climate change (Nisbet, Hart et al., 2013), policy preferences (Boukes & Boomgaarden, 2015), political polarization (Bolsen & Shapiro, 2018; Han & Federico, 2018), etc. Thus, as in other crises, we can assume that the consumption of news content also shaped attitudes towards the unvaccinated during the pandemic (see Vigso & Odén, 2016).

Research on framing effects has identified various news framing techniques, often distinguishing between *issue-specific* and *general frames* (e.g. Lecheler & De Vreese, 2019). Issue-specific frames are utilized for a specific issue, whereas generic frames are commonly applied in news writing on a wide range of topics (D'Aangelo, 2017; de Vreese, 2005). Further, research has identified *episodic* and *thematic frames* as the most frequently used forms of general frames (D'Angelo, 2017). The episodic news frame entails presenting issues through specific incidents (Iyengar, 1996), allowing individualized examples, such as recounting the personal experience of a single vaccine refuser. Conversely, the thematic news frame portrays issues more abstractly by embedding them within a broader societal context, often with statistical background information supporting them (Iyengar, 1996), such as statistical data about the rationale for refusing vaccination. Consequently, exposure to thematic frames causes individuals to perceive social issues in collective terms, whereas episodic frames encourage and stimulate individual-level blame (Iyengar, 1991).

Research has provided some evidence to support these claims. First, episodic frames create more intense negative emotional reactions relative to thematic frames (e.g. Ciuk & Rottman, 2020), and they cause recipients to feel less empathy towards sufferers of mental illness (Chung & Kim, 2019). Another well-known effect of episodic framing is its association with fostering more unfavourable attitudes towards minorities (Feezell et al., 2021). However, some studies have indicated that episodic framing might also have favourable outcomes on public attitudes. Depending on the context, episodic framing might generate empathy towards the individuals and groups portrayed in the frame (e.g. Aarøe, 2011; Gross, 2008). This effect appears to be influenced by the direction of the arguments and the content of the frame (Aarøe, 2011).

Similarly, in a recent survey experiment, Boyer et al. (2022) discovered that episodic framing may occasionally reduce identity-driven thinking and lead to less polarized attitudes towards outgroups.

2.2. Trust as a moderator of news framing effects

Research has shown that framing effects on political attitudes and views are not uniform and may be moderated by individual characteristics, such as prior beliefs, values and political ideology (Boukes, 2022; Nabi, 2003; Slothuus & De Vreese, 2010). More generally, trust has also emerged as a key moderating factor around framing effects, encompassing both trust in news media (Miller & Krosnick, 2000) and the credibility of framing sources (Druckman, 2001) as influential factors. However, the role of trust in institutions as a potential moderator has remained unclear, which is the focus of this paper.

We define trust in institutions as the general trust placed in key public institutions, such as parliament, the police and the legal system. This enables the capturing of citizens' assurance in vital establishments that symbolize the domains of politics, societal order and protection (Schneider, 2017). Overall, trust in public and political institutions stands as a foundational pillar of democratic society, reflecting individuals' confidence in the capabilities of political institutions and leaders (Levi & Stoker, 2000). Our approach to exploring the ways in which trust influences news framing effects is in line with an idea presented by Lecheler and De Vreese (2019), who argued that the factors modifying framing effects could fall into three categories: long-lasting traits, flexible political views and temporary psychological states. The relevance of trust is notable within these categories. It is a mixture of something that sticks around over time, is influenced by the social environment and deep-seated beliefs, represents political ideology and remains subject to change based on the immediate circumstances and citizens' responses to institutional performance (see Citrin & Stoker, 2018).

We expect the importance of trust to be highlighted in exceptional circumstances, such as the COVID-19 pandemic, where it was found to acutely affect responses to key policy interventions (Allington et al., 2023; Hetherington & Rudolph, 2022; Kestilä-Kekkonen et al., 2022; Ye et al., 2023). Studies of vaccines have highlighted how high trust in government predicts vaccine uptake (Ye et al., 2023) and how low trust is associated with negative attitudes toward vaccines (Allington et al., 2023).

Previous studies have not sufficiently explored how trust in institutions functions as a moderator of framing effects, particularly in contexts of episodic and thematic framing. Nevertheless, insights from extensive examinations of dispositional moderators in health communication offer a broad perspective that we can apply here. These insights show that factors associated with overall trust, such as being optimistic and having confidence in overcoming diseases, play a significant role in influencing how people respond to health-related messages (Covey, 2014). Consequently, it is reasonable to expect that the importance of trust in institutions also extends to the domain of news framing.

Anchored within the framework of cognitive dissonance theory (Festinger, 1957), individuals whose pre-existing attitudes align with specific content tend to be more susceptible to the effects of this content, whereas those holding oppositional views might resist or counterbalance the information presented (Knobloch-Westerwick et al., 2020; Lecheler & De Vreese, 2019). This dynamic interlinks with the inclination of individuals with high political trust in placing greater reliance on credible political information sources (Lupia & McCubbins, 1998). Relatedly, recent research has shown the elemental role of citizens' trust in government decision-making about whether to take COVID-19 vaccines (Allington et al., 2023; Ye et al., 2023). Consequently, individuals characterized by high levels of trust display greater receptiveness to information disseminated by widely respected political institutions, perceiving it as both credible and accurate. Conversely, those harbouring lower levels of trust might approach news content from official

sources with a sense of scepticism, seeing it as potentially manipulative or biased.

However, previous research has also supported the opposite perspective, suggesting that an experimental scenario could lead to contradictory results when respondents are exposed to information that is antithetical to their prior beliefs. In line with the political trust-as-heuristic model (Hetherington, 2005), high political trust can serve as a cognitive shortcut for making specific decisions that align with the dominant political consensus. Insights from studies in health communication suggest that individuals with a high level of trust tend to be less receptive to information that challenges mainstream viewpoints, particularly information that criticizes those holding positions of authority (Wu et al., 2023). Additionally, it seems that high trust can act as a defence mechanism against endorsing conspiracy theories. This mechanism seems to function even when individuals possess limited political knowledge and, consequently, are susceptible to various external influences (Miller et al., 2016). Overall, therefore, trust assumes a multifaceted role in influencing how individuals assimilate information and engage with news content.

3. The study

3.1. Hypotheses

First, we compared two treatment groups—one group was exposed to an episodic news frame, while the other was exposed to a thematic news frame—with a control group. The reactions evoked by these frames depended on how the subject was presented, that is, the content of the frame (Chong & Druckman, 2007). Our study focuses on vaccination, and in this context, it is important to note that individuals' adherence to health measures evolved into a moral issue during the pandemic (Kasper, 2022; Prosser et al., 2020), with vaccination emerging as a particularly contentious subject (Claudy et al., 2022; Rosenfeld & Tomiyama, 2022; Ye et al., 2023). In our experiment, the participants were exposed to frames discussing why individuals with chronic illnesses might refuse the COVID-19 vaccine (see Appendix A). Given this context, we can assume that the content of the frame may reduce the intensity of attitudes towards those who choose to remain unvaccinated, which is in line with recent findings (Boyer et al., 2022). Based on this premise, we hypothesize the following.

H1. Compared to the control group, exposure to an episodic frame reduces support for additional restrictions on the unvaccinated.

H2. Compared to the control group, exposure to a thematic frame reduces support for additional restrictions on the unvaccinated.

Research evidence also suggests that the use of episodic frames can occasionally lead to a reduction in the strength of the attitudes towards outgroups, especially in comparison to thematic frames (Boyer et al., 2022). By focusing on individual stories and anecdotes, episodic frames may evoke a more empathetic and nuanced understanding of situations, potentially softening initial rigorous attitudes towards minority groups that might otherwise be regarded with scepticism. Accordingly, we hypothesize as follows.

H3. Compared to a thematic frame, an episodic frame results in a greater reduction of support for additional restrictions on the unvaccinated.

In the final stage of the analysis section, we introduce a novel perspective to the literature by evaluating the moderating effects of trust in institutions on both episodic and thematic framing effects. We contend that trust encompasses several elements that have been suggested to hold significance as moderators of framing effects (Lecheler & De Vreese, 2019). It can be conceptualized as a component of personality traits (Mondak et al., 2017), a facet of political ideology (Hetherington, 1998) and even a transient emotion (Lahno, 2020, p.

147). However, because of the multidimensionality of trust, it is difficult to anticipate the direction of its moderating effects; thus, it remains a matter of speculation. Additionally, it is important to note that both the context and frame matter. Therefore, we consider the following research question.

RQ1. How does trust in institutions moderate framing effects?

3.2. Participants

The study follows the latest recommendations on survey designing and reporting (e.g. Zimba & Gasparyan, 2023). The data were collected from the fourth wave of the Digital Age in Finland longitudinal survey, which began in December 2017 and has been conducted approximately every 15–18 months since. This follow-up survey asked about the general population's use of digital media, political opinions and well-being. The third and fourth waves of the survey also included a separate section on COVID-19-related questions. The fourth survey was used in this study and was conducted from 10 December 2021 to 10 January 2022 during the fourth wave of the COVID-19 outbreak. This wave also included a separate survey experiment, which was used in this study. All questions posed in the experiment are presented in Appendix A. The whole questionnaire and more details on data collection procedures are presented in a data report (Koivula et al., 2020).

The study focused on the Finnish-speaking adult population born between 1943 and 1999. A total of 543 respondents participated in the fourth wave, 482 of whom completed the experimental part of the study. The sample is representative of the Finnish population in terms of age, gender and region, with slightly more highly educated respondents (see Table A1, Appendix A).

As our survey aimed to understand the respondents' opinions regarding unvaccinated people, we filtered out all the unvaccinated respondents ($n = 27$) to avoid in-group biases. Therefore, the final sample included 455 respondents who had received at least one COVID-19 vaccine. The survey did not enquire about the specific vaccine received; however, in Finland, most respondents had received the Pfizer–Biontech or Moderna mRNA vaccines by the end of 2021, although some had also received AstraZeneca's Vaxzevria vaccine, for example, older people. It is important to note that the data were collected during the COVID-19 period when the Omicron variant began to spread in Finland, which should be considered when interpreting the results. Further details on the pandemic situation during the data collection are provided in Appendix B.

3.3. Experiment

To investigate the effects of vaccination-related news on people's attitudes towards the unvaccinated, we developed three frames based on our analysis of Finnish news media from October to November 2022. The two most common framing types found in the news were episodic and thematic in nature, which we used to construct our frames. Additionally, we included a control group that received only basic information about the issue and no framing. All three versions were based on real news stories, and we provide both the original Finnish and English-translated texts in Appendix A.

We designed the frames based on real news stories featured in the media. The central focus within both the episodic and thematic frames was to spotlight the risks associated with vaccine side effects. In each frame, there was a brief clarification that severe side effects were extremely rare. Following this, the frames presented varying content concerning the types of side effects and the specific groups that might be more susceptible to be affected by them. While the thematic frame accentuated risks through references to scientific research, the episodic frame centered on an individual citizen's personal experiences and apprehensions about potential side effects.

To ensure that all the participants had as similar a basis of

understanding as possible before encountering the different frames, we provided a similar initial prompt within each frame, including for the control group. This approach reflects everyday situations where people tend to have some basic awareness of a topic. The original frames were written in Finnish, and for the sake of clarity, we included both the original Finnish texts and their English translations in an appendix to the article.

Our study employed a between-person analysis method, wherein participants were subjected to different experimental treatments but underwent a uniform assessment thereafter, an approach following that of Charness et al. (2017). The sample was randomly divided into three distinct groups, each assigned a unique experimental treatment (referred to as news framing). These treatments were administered at the conclusion of the survey after acquiring informed consent from each participant.

To verify the success of the randomization process, we cross-tabulated the participants' responses with questions pertaining to various background variables, including age, gender, education and geographic distribution. A comparative analysis of these variables is presented in [Appendix Table A1](#). As shown in the table, the treatment groups did not exhibit significant differences regarding demographic factors.

3.4. Measurements

Our main outcome variable was *support for additional restrictions on the unvaccinated*, which measured individuals' attitudes regarding policies enacting stricter COVID-19 measures on unvaccinated individuals. The original survey questions (see [Table 1](#)) were presented after the experimental news frames. While the episodic and thematic news frames focused on individuals with underlying medical conditions, which increased their vaccination-related risks, the original survey questions concerned the broader category of unvaccinated citizens. We chose this broader scope because the control group's news frame did not emphasize specific population groups within the unvaccinated category, and we were especially interested in whether additional information presented in the thematic and episodic news frames could broadly mitigate restrictive attitudes among respondents.

In the original questionnaire, we asked the respondents to rate four items on a scale from 1 (strongly disagree) to 5 (strongly agree). The original items were "The participation of unvaccinated individuals in public events (concerts, sports events, etc.) should not be restricted" (reversed), "Employers should have the option to terminate the contract of an unvaccinated employee," "In the event of a worsening COVID-situation, stricter restrictions should not be solely targeted at the unvaccinated" (reversed), and "Taking the COVID-19 vaccine should be made mandatory." In previous research, the effect of framing on policy views has been examined in various contexts (e.g. [Clifford & Piston, 2017](#); [Feldman & Hart, 2018](#); [Gross, 2008](#)). As we were not aware of research focusing on the effect of framing on COVID-19-related policies, we created our items based on the public debate at the time of the data collection in Finland regarding possible additional restrictions on unvaccinated citizens. Based on these four items, we formed an additive index variable on a scale from 1 to 5, with higher values indicating positive attitudes towards additional measures on the unvaccinated. Cronbach's alpha for the variables was 0.73, indicating a relatively high correlation among the original items.

For the moderating variable, we employed a measure of trust in institutions that combined elements measuring the participants' trust in parliament and the legal system and police (for the utilization of the corresponding measures, see [Oksanen et al., 2020](#); [Schuessler et al., 2023](#)). For the original questions, the participants rated their level of trust using a 5-point scale ranging from 1 (*not trustworthy at all*) to 5 (*very trustworthy*). This was used as a continuous variable in the analysis. Cronbach's alpha for the variables was 0.75, indicating sufficient correlation among the items.

Table 1

Descriptive statistics (means, standard deviations, frequencies and distributions) by framing treatment.

	framing			
	control	episodic	thematic	Total
N	162 (35.6%)	152 (33.4%)	141 (31.0%)	455 (100.0%)
<i>Support for additional restrictions on the unvaccinated (index variable)</i>	3.673 (0.867)	3.436 (0.860)	3.656 (0.885)	3.588 (0.875)
a) The participation of unvaccinated individuals in public events (concerts, sports events, etc.) should not be restricted. (reversed to the index variable)	1.660 (1.257)	1.816 (1.304)	1.709 (1.174)	1.727 (1.247)
b) Employers should have the option to terminate the contract of an unvaccinated employee	2.500 (1.301)	2.296 (1.167)	2.652 (1.325)	2.479 (1.271)
c) In the event of a worsening COVID-19 situation, stricter restrictions should not be solely targeted at the unvaccinated. (reversed to the index variable)	1.599 (1.000)	1.875 (1.135)	1.589 (0.895)	1.688 (1.024)
d) Taking the COVID-19 vaccine should be made mandatory	3.451 (1.379)	3.138 (1.362)	3.270 (1.419)	3.290 (1.389)
<i>Trust in institutions (index variable)</i>	3.652 (0.832)	3.836 (0.704)	3.819 (0.669)	3.765 (0.745)
a) Trust in parliament	3.296 (0.990)	3.428 (0.960)	3.429 (0.938)	3.381 (0.964)
b) Trust in the legal system	3.677 (1.099)	3.993 (0.888)	3.964 (0.835)	3.872 (0.962)
c) Trust in police	3.981 (0.909)	4.086 (0.898)	4.057 (0.791)	4.040 (0.870)
<i>Vaccine attitudes (index variable)</i>	4.424 (0.744)	4.508 (0.574)	4.388 (0.583)	4.441 (0.643)
a) COVID-19 vaccines are safe	4.364 (0.890)	4.493 (0.683)	4.333 (0.743)	4.397 (0.782)
b) COVID-19 vaccines are an effective method of safeguarding oneself against the severe form of the disease (reversed to the index variable)	4.636 (0.869)	4.800 (0.518)	4.709 (0.555)	4.713 (0.676)
c) I have apprehensions regarding the potential side effects of COVID-19 vaccines	1.981 (1.134)	1.940 (1.088)	2.284 (1.215)	2.062 (1.152)
d) COVID-19 vaccines have limited utility. (reversed to the index variable)	1.321 (0.769)	1.320 (0.726)	1.206 (0.514)	1.285 (0.685)
<i>COVID-19 efficacy</i>				
The pandemic is difficult to understand (reversed for further analysis)	1.741 (0.882)	1.914 (0.920)	2.057 (1.051)	1.896 (0.956)
<i>Party preference</i>				
Government	93 (36.9%)	90 (35.7%)	69 (27.4%)	252
Opposition/other or NA	69 (34.9%)	61 (30.8%)	68 (34.3%)	198
Total sample: N = 455				

We controlled multiple factors that could affect the moderating effect of trust in institutions. First, we considered respondents' *attitudes towards COVID-19 vaccines*. Previous research has illustrated the strong connection between vaccine attitudes and perceived trust, which could affect the interpretation of the results (see [Yaqub et al., 2014](#)). We measured attitudes towards COVID-19 vaccines using a continuous composite variable based on four survey items: "COVID-19 vaccines are

safe" (reversed), "COVID-19 vaccines are a good way to protect oneself from the severe form of coronavirus disease" (reversed), "I'm concerned about the side effects of COVID-19 vaccines," and "COVID-19 vaccines are hardly useful." The respondents rated their stance on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's alpha among the items was 0.86, which supports our decision to form the composite variable.

We also controlled the respondents' *perceived self-efficacy related to the COVID-19 pandemic*. Generally, within political processes, self-efficacy reflects the extent to which citizens perceive powerfulness or powerlessness in the political realm (Morrell, 2003). Thus, as the COVID-19 pandemic disrupted society in general, it was important to control the effects of individuals' perceptions of their own capacities during that period. Additionally, research has presented clear connections between self-efficacy and forms of trust and how these elements intertwined during the pandemic (e.g. Hassan et al., 2022). Thus, self-efficacy could also distort the connection between perceived trust and restrictive policy attitudes in our analyses. One variable measuring the respondents' self-efficacy related to the pandemic was based on a survey question inquiring about the extent to which they agreed that the COVID-19 pandemic was challenging for them to comprehend. The respondents rated their stance on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Finally, given the politicization of COVID-19 vaccinations, particularly the rights of those who chose not to be vaccinated, which intensified after the introduction of vaccines, it was crucial to consider the respondents' political orientation (Ward et al., 2020; Wollebæk et al., 2022). We measured their political stances based on their party preference. Initially, in the second phase of the longitudinal survey in the spring of 2019, we asked the respondents to name the party they would vote for in the upcoming 2019 parliamentary elections, which laid the foundation for the Finnish party-political realm for the entire COVID-19 period. The original question directed the respondents to choose the closest party from nine parliamentary parties in Finland, namely the Social Democrats (SDP), the Finns Party (FP), the National Coalition (NCP), the Center Party (CPF), the Green League (GL), the Left Alliance (LA), the Swedish People's Party (SPP), the Christian Democrats (CDP) and Movement Now (MN). Additionally, through open-ended answers, the respondents could choose a non-parliamentary party, and the "none of the parties" option meant that they could not choose a party. In the analyses, we contrasted the respondents based on whether the party they favoured was in the government (SDP, CPF, GL, LA and SPP) or the opposition (FP, NCP, CDP and MN). Furthermore, we established a distinct category for respondents who did not express a preference for a party and those who endorsed a minor political party.

3.5. Methods

We performed all the analyses using the Stata 18 software. We began by analysing the descriptive statistics in the data. To test the hypotheses, we used an ordinary least squares (OLS) model to predict the respondents' policy views based on the framing treatment alongside the control variables. To compare the effects of episodic and thematic framing, we ran distinct Wald tests and provided F statistics that showed the extent to which the effects differed between the two approaches. We also depicted the OLS results by showing the predicted marginal means for each framing treatment.

Afterwards, we focused on investigating how trust in institutions could influence the relationship between the framing treatment and policy views. To accomplish this, we created models that included the interaction term between the framing and trust in institutions. Moreover, using a "coefplot" command, we depicted the results to determine how the effect of framing changed depending on the level of political trust. In the figure, we present group means for three categories based on different levels of trust. The first group consisted of respondents who were placed more than one standard deviation below the mean; the

second group consisted of respondents who were placed less than one standard deviation away from the mean; and the third group comprised those who were more than one standard deviation above the mean. In simpler terms, we aimed to create three distinct groups based on levels of trust—low, medium and high trust. Our objective here was to illustrate how both trust in institutions and various news framing approaches together influenced attitudes towards restrictive policies.

Ethics approval

The study adheres to the ethical principles set by the Finnish National Board on Research Integrity TENK (2019). An ethical review statement must be obtained from a human sciences ethics committee if research involves a deviation from informed consent, physical intervention, minors under 15, exposure to strong stimuli, excessive mental harm or safety threats. As none of these applied, an ethical review statement was not requested.

The participants were informed of their rights under the European General Data Protection Regulation, and they provided informed consent upon registering for the online panel. This procedure follows standard national guidelines for participant recruitment. The participants could withdraw from the study and request rectification or deletion of their information at any time. All participants were at least 18 years old.

4. Results

Table 1 shows the descriptive results of the variables for the data set and each experimental group. First, the results show that, on average, the respondents supported additional restrictions and measures against the unvaccinated. They had a rather negative attitude about the idea that the unvaccinated could not be restricted from public events or that they could not be the target of stricter restrictions. At the same time, they supported mandatory vaccination, on average, and non-vaccination was not frequently considered a justification for termination.

Our data also revealed that trust in institutions was notably high at the end of the second year of COVID-19. In relative terms, the respondents had the highest level of trust in the police and the lowest in parliament. Additionally, the results suggest that, on average, the respondents had very positive attitudes about vaccines. Finally, the findings indicate that the pandemic was not perceived as an exceptionally complex phenomenon to understand at this stage of the crisis.

In what follows, we test our hypotheses by exploring how the framing affected the respondents' support for additional restrictions on the unvaccinated. Table 2 shows the results of the OLS regression. As observed, episodic framing exerted a negative effect on support for additional restrictions in comparison to the control framing, thereby affirming our first hypothesis ($B = -0.295, p = 0.001$). In contrast, our second hypothesis lacked confirmation because we found no significant decrease in the strength of the opinions through thematic framing relative to the control group ($B = 0.011, p = 0.907$). Instead, our third hypothesis was confirmed because there was a significant difference between the thematic and episodic framings ($F = 10.49, p = 0.001$). Overall, the results show that episodic framing mitigated support for additional restrictions on the unvaccinated and reduced the desire for stricter policies. The results are depicted in Fig. 1.

The findings also demonstrate that individuals with more positive attitudes towards vaccines were more inclined to support stricter policies. Finally, the model considered the effect of party preference and COVID-19 self-efficacy, both of which had insignificant relationships with support for additional restrictions.

The second model incorporated the variable of trust in institutions. The results revealed a negative correlation between trust and support for additional restrictions ($B = -0.136, p = 0.009$), indicating that greater levels of trust were aligned with a lower inclination to limit the rights of

Table 2

OLS regression analysis results (dependent variable: support for additional restrictions on the unvaccinated; independent variable: framing treatment; moderator: trust in institutions; control variables: vaccine attitudes, COVID-19 efficacy, party preference).

VARIABLES	Model 1			Model 2			Model 3		
	B	SE	P	B	SE	P	B	SE	P
Framing Treatment Control (ref.)									
Episodic	-0.294	0.091	0.001	-0.284	0.091	0.002	-1.109	0.460	0.016
Thematic	0.002	0.092	0.981	0.066	0.094	0.484	-0.241	0.473	0.612
Trust in institutions				-0.142	0.052	0.007	-0.230	0.077	0.003
Interactions									
Control * Trust in institutions (ref.)									
Episodic framing * Trust in institutions							0.218	0.119	0.068
Thematic framing * Trust in institutions							0.084	0.123	0.498
Control variables									
Vaccine attitude	0.526	0.059	0.000	-0.590	0.069	0.000	-0.600	0.069	0.000
COVID-19 efficacy				-0.044	0.041	0.281	-0.046	0.041	0.263
Party preference:									
Opposition				0.039	0.090	0.664	0.045	0.089	0.613
Other or NA				-0.244	0.104	0.020	-0.246	0.104	0.019
Constant	4.528	0.116	0.000	5.112	0.259	0.000	5.444	0.335	0.000
Observations	453			450			450		
R-squared	0.165			0.192			0.198		

B = unstandardized regression coefficients; SE = standard errors; P = P value.

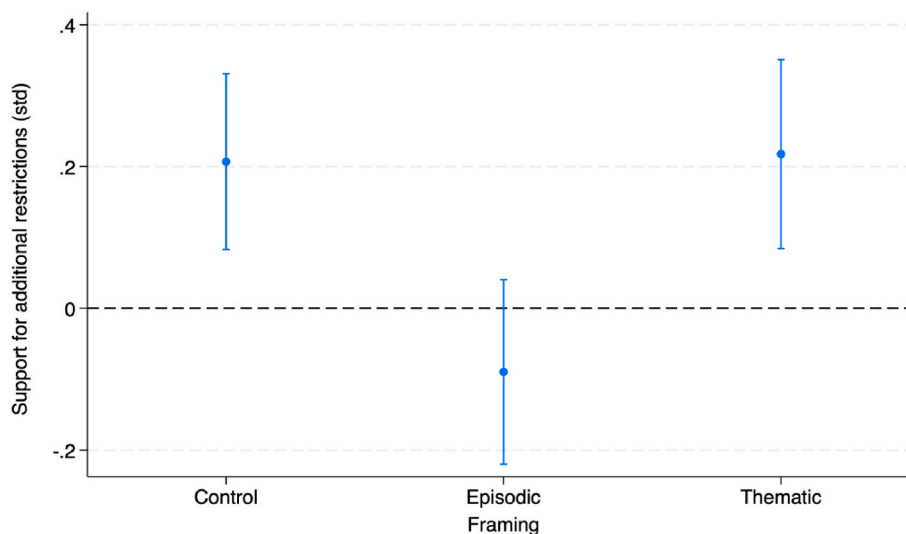


Fig. 1. The effect of news framing on attitudes towards the unvaccinated.

the unvaccinated. Here, we highlight that the model also accounts for general attitudes towards vaccines. We conducted an additional analysis to examine the total effect of trust, that is, we allowed vaccine attitudes to vary with trust. The results of the additional analysis showed no significant association between trust and support for additional restrictions when the variation in vaccine attitudes was not considered ($B = -0.024, p = 0.660$).

In the third model, we explored the interaction between trust in institutions and framing effects. The results indicate that trust somewhat moderates the effect of episodic framing, albeit with a relatively moderate effect size ($B = 0.218, p = 0.068$). We depict this outcome in Fig. 2, which illustrates that the framing effect was more pronounced among respondents with lower levels of trust. Notably, the episodic framing differed from other treatments. For respondents with a mean level of trust, the effect of framing was quite similar but slightly smaller. In contrast, there were no significant differences in the effects of the frames among respondents with high levels of trust.

5. Discussion

In this study, our primary focus was to understand the effect of episodic and thematic news frames on support for additional restrictions on the unvaccinated during the COVID-19 pandemic. Moreover, we explored how trust in institutions moderates the effects of news framing. To test the hypotheses regarding direct framing effects and solve the research question concerning the moderating effect of trust, we used an experimental design in which we exposed participants to different types of news framing stimuli. The experimental groups were presented with either a news story about vaccine-related risks with an episodic or thematic frame; the episodic one was based on an individual story, while the thematic one was based on a general description (see Iyengar, 1996). In addition, we formed a control group that received only basic information about the issue with no additional framing.

Our findings supported the first hypothesis, demonstrating that individuals exposed to episodic news framing have milder policy opinions towards the unvaccinated in comparison to the control group. However,

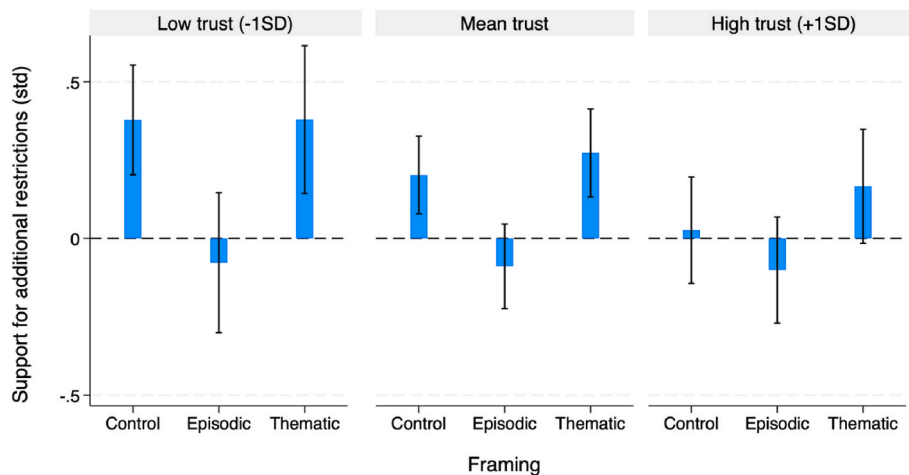


Fig. 2. The effect of news framing on attitudes towards the unvaccinated by trust in institutions.

contrary to our expectations, thematic framing did not have a significant effect on respondents' attitudes. Confirming the third hypothesis, we observed that episodic framing more distinctly diminished the strength of attitudes towards the unvaccinated in comparison to the thematic framing treatment. These findings are in line with previous research suggesting that due to the more personal nature of episodic frames, they tend to provoke strong reactions across various subjects (e.g. Aarøe, 2011). Our findings also correspond with prior results pointing out that episodic framing can reduce identity-based thinking and moderate attitudes towards different groups in society (Boyer et al., 2022). Additionally, these results expand on previous notions (Ciuk & Rottman, 2020) and indicate that framing effects can manifest in matters of high significance, exemplified by health-related behaviours observed during the COVID-19 pandemic. This highlights that, alongside central public actors such as health institutions, governments, politicians and researchers (Allington et al., 2023; Lupton, 1993; Ye et al., 2023), the traditional news media play a central role in conveying information about health risks, thereby shaping new health-related norms and influencing public opinions (Schultz et al., 2011).

Moreover, we found that trust in institutions moderates the relationship between news framing and political attitudes. According to our analyses, episodic news framing weakened attitudes regarding the unvaccinated, particularly among respondents with low and mean levels of institutional trust. Overall, when news articles portrayed their subjects with a "human face," this served to mitigate the sharpest edges in readers' reactions, which were especially pronounced among those with low institutional trust.

The results on the role of trust align with the trust-as-heuristic hypothesis, illustrating the ways in which trust affects individuals' receptiveness to and understanding of news frames, consequently shaping their political opinions (Hetherington, 2005; Hetherington, 1998). The heuristic idea is highlighted by how a high level of trust can hinder changes in opinion based on media frames. In this respect, the result is also in line with findings that suggest that high trust predicts lower receptivity to information that challenges mainstream views and is critical towards authoritarians (Miller et al., 2016; Wu et al., 2023). Although the news frames we presented did not criticize the prevailing policy, they highlighted facts about the risks of vaccination that were partly against the general discourse that everyone should get vaccinated.

Furthermore, in addition to the moderating role of trust in institutions, we found that it had a positive direct association with opinions towards the unvaccinated. Interestingly, our findings contradict prior research suggestions of a positive relationship between trust and support for restrictive policies (Hetherington & Rudolph, 2022). The primary driver of this direct association with trust was the adjustment of general vaccine attitudes. On average, a high level of trust predicted

favourable attitudes towards vaccines, which in turn led to a more positive stance on stricter policies concerning the rights of the unvaccinated. This complements previous findings which have shown that high levels of trust increase vaccine uptake and positive attitudes towards vaccines (see Allington et al., 2023; Ye et al., 2023). However, when we accounted for differences in vaccine attitudes, the effect of trust became negative. This result is also interesting for other studies to understand the role of trust in different political attitudes (e.g. Devine, 2024). Our results suggest that the influence of trust on political opinions may depend on other general attitudes.

The findings contribute to our understanding of the importance of trust and health communication in reducing inter-group tensions and polarization during the pandemic (e.g. Bor et al., 2022; Prosser et al., 2020). Our analyses reveal that media framing, trust in institutions, and the formation of moral attitudes are interconnected during a health crisis. The news media play a crucial role in risk communication, significantly influencing citizens' attitudes and judgments. However, people's judgments are not solely shaped by media exposure; they are also heavily influenced by their prior beliefs and general trust in institutions. This highlights the limitations of the media's impact and underscores the importance of considering these factors in communication strategies.

These findings are particularly valuable for managing future societal crises and have some practical implications. Public health authorities and policymakers should design communication strategies that account for the diverse backgrounds and pre-existing beliefs of their audience. Building general trust in institutions can increase societal resilience, while the media should balance individual and emotional stories with general factual reporting to provide a comprehensive understanding of issues. Enhancing media literacy among citizens is also crucial to reduce misinformation and improve public trust in accurate reporting.

Nevertheless, our study has some limitations. First, our research design did not consider the participants' prior exposure to the subject matter, namely, restrictive policy proposals related to the COVID-19 pandemic. This implies that individuals who had recently been informed about the issue might have responded differently compared to those who were unfamiliar with it (see Druckman & Leeper, 2012). Even though the randomized setup of our experiment aimed to control for significant pre-existing differences in opinions across groups (Alferes, 2012), especially considering our pre-experiment measurements of vaccination attitudes and COVID-19 self-efficacy, it is noteworthy that we assessed opinions on the unvaccinated as a post-experiment, potentially introducing the risk of unobserved variations tied to other factors. Future researchers could explore a repeated measures design that facilitates a longitudinal examination of changes within respondents, including their attitudes and emotions prior to their exposure to frames

(see Clifford et al., 2017).

CRedit authorship contribution statement

Aki Koivula: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Eetu Marttila:** Writing – review & editing, Writing – original draft, Investigation, Data curation, Conceptualization, Methodology. **Ilkka Koiranen:** Writing – review & editing, Investigation, Conceptualization, .

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Aki Koivula reports financial support was provided by Helsingin Sanomat Foundation. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ssaho.2024.101157>.

References

- Aarøe, L. (2011). Investigating frame strength: The case of episodic and thematic frames. *Political Communication*, 28(2), 207–226. <https://doi.org/10.1080/10584609.2011.568041>
- An, S. K., & Gower, K. K. (2009). How do the news media frame crises? A content analysis of crisis news coverage. *Public Relations Review*, 35(2), 107–112.
- Bolsen, T., & Shapiro, M. A. (2018). The US news media, polarization on climate change, and pathways to effective communication. *Environmental Communication*, 12(2), 149–163.
- Bor, A., Jørgensen, F., Lindholt, M. F., & Petersen, M. B. (2022). Moralizing the COVID-19 pandemic: Self-interest predicts moral condemnation of other's compliance, distancing, and vaccination. *Political Psychology*. <https://doi.org/10.1111/pops.12835>
- Bor, A., Jørgensen, F., & Petersen, M. B. (2023). Discriminatory attitudes against unvaccinated people during the pandemic. *Nature*, 613(7945), 704–711. <https://doi.org/10.1038/s41586-022-05607-y>
- Boukes, M. (2022). Episodic and thematic framing effects on the attribution of responsibility: The effects of personalized and contextualized news on perceptions of individual and political responsibility for causing the economic crisis. *The International Journal of Press/Politics*, 27(2), 374–395.
- Boukes, M., Boomgaarden, H. G., Moorman, M., & De Vreese, C. H. (2015). Political news with a personal touch: How human interest framing indirectly affects policy attitudes. *Journalism & Mass Communication Quarterly*, 92(1), 121–141.
- Boyer, M. M., Lecheler, S., & Aaldering, L. (2022). Don't throw the frame out with the bathwater: How episodic news frames can prevent identity-motivated reasoning. *Journalism & Mass Communication Quarterly*. <https://doi.org/10.1177/10776990221097057>, 10776990221097057.
- Chong, D., & Druckman, J. N. (2007). Framing theory. *Annual Review of Political Science*, 10, 103–126.
- Chung, M., & Kim, H. K. (2019). Effects of media frame and onset controllability on support for postpartum depression policy. *Journal of Health Communication*, 24(7–8), 674–682. <https://doi.org/10.1080/10810730.2019.1657525>
- Citrin, J., & Stoker, L. (2018). Political trust in a cynical age. *Annual Review of Political Science*, 21, 49–70.
- Ciuk, D. J., & Rottman, J. (2020). Moral conviction, emotion, and the influence of episodic versus thematic frames. *Political Communication*. <https://doi.org/10.1080/10584609.2020.1793847>
- Claudy, M. C., Vijayakumar, S., & Campbell, N. (2022). Reckless spreader or blameless victim? How vaccination status affects responses to COVID-19 patients. *Social Science & Medicine*. <https://doi.org/10.1016/j.socscimed.2022.115089>
- Clifford, S., & Piston, S. (2017). Explaining public support for counterproductive homelessness policy: The role of disgust. *Political Behavior*, 39, 503–525.
- Covey, J. (2014). The role of dispositional factors in moderating message framing effects. *Health Psychology*, 33(1), 52.
- D'Angelo, P. (2017). Framing: Media frames. In *The international encyclopedia of media effects* (pp. 1–10). Wiley. <https://doi.org/10.1002/9781118783764.wbieme0048>
- de Vreese, C. H. (2005). News framing: Theory and typology. *Information Design Journal & Document Design*, 13(1), 51–62.
- Devine, D. (2024). Does political trust matter? A meta-analysis on the consequences of trust. *Political Behavior*, 1–22.
- Devine, D., Valgarðsson, V., Smith, J., Jennings, W., Scotto di Vettimo, M., Bunting, H., & McKay, L. (2023). Political trust in the first year of the COVID-19 pandemic: A meta-analysis of 67 studies. *Journal of European Public Policy*, 1–23. <https://doi.org/10.1080/13501763.2023.2169741>
- Druckman, J. N. (2001). The implications of framing effects for citizen competence. *Political Behavior*, 23(3), 225–256.
- Engler, S., Brunner, P., Loviat, R., Abou-Chadi, T., Leemann, L., Glaser, A., & Kübler, D. (2021). Democracy in times of the pandemic: Explaining the variation of COVID-19 policies across European democracies. *West European Politics*, 44(5–6), 1077–1102. <https://doi.org/10.1080/01402382.2021.1900669>
- Feezell, J. T., Glazier, R. A., & Boydston, A. E. (2021). Framing, identity, and responsibility: Do episodic vs. thematic framing effects vary by target population? *Politics, Groups, and Identities*, 9(2), 347–368. <https://doi.org/10.1080/21565503.2019.1584751>
- Fehr, E., & Fischbacher, U. (2004). Third-party punishment and social norms. *Evolution and Human Behavior*, 25(2), 63–87. [https://doi.org/10.1016/S1090-5138\(04\)00005-4](https://doi.org/10.1016/S1090-5138(04)00005-4)
- Feldman, L., & Hart, P. S. (2018). Is there any hope? How climate change news imagery and text influence audience emotions and support for climate mitigation policies. *Risk Analysis*, 38(3), 585–602.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.
- Graso, M., Aquino, K., Chen, F. X., & Bardosh, K. (2023). Blaming the unvaccinated during the COVID-19 pandemic: The roles of political ideology and risk perceptions in the USA. *Journal of Medical Ethics*. <https://doi.org/10.1136/jme-2022-108825>
- Gross, K. (2008). Framing persuasive appeals: Episodic and thematic framing, emotional response, and policy opinion. *Political Psychology*, 29(2), 169–192. Hassan, M. S., Al Han, J., & Federico, C. M. (2018). The polarizing effect of news framing: Comparing the mediating roles of motivated reasoning, self-stereotyping, and intergroup animus. *Journal of Communication*, 68(4), 685–711.
- Hensel, L., Witte, M., Caria, A. S., Fetzer, T., Fiorin, S., Götz, F. M., Gomez, M., Haushofer, J., Ivchenko, A., Kraft-Todd, G., Reutskaja, E., Roth, C., Yoeli, E., & Jachimowicz, J. M. (2022). Global behaviors, perceptions, and the emergence of social norms at the onset of the COVID-19 pandemic. *Journal of Economic Behavior & Organization*, 193, 473–496. <https://doi.org/10.1016/j.jebo.2021.11.015>
- Hetherington, M. J. (1998). The political relevance of political trust. *American Political Science Review*, 92(4), 791–808.
- Hetherington, M. J. (2005). *Why trust matters: Declining political trust and the demise of American liberalism*. Princeton University Press.
- Hetherington, M. J., & Rudolph, T. J. (2022). The nature of political trust in mass publics. In *Handbook on politics and public opinion* (pp. 356–373). Oxford University Press.
- Iyengar, S. (1996). Framing responsibility for political issues. *The Annals of the American Academy of Political and Social Science*, 546(1), 59–70.
- Kestilä-Kekkonen, E., Koivula, A., & Tiihonen, A. (2022). When trust is not enough: A longitudinal analysis of political trust and political competence during the first wave of the COVID-19 pandemic in Finland. *European Political Science Review*, 14(3), 424–440.
- Knobloch-Westerwick, S., Mothes, C., Johnson, B. K., Westerwick, A., & Donsbach, W. (2020). Confirmation bias, ingroup bias, and negativity bias in selective exposure to political information. *Communication Research*, 47(1), 104–124.
- Lahno, B. (2020). Trust and emotion. In J. Simon (Ed.), *The Routledge handbook of trust and philosophy* (pp. 147–159). Routledge.
- Lecheler, S., & De Vreese, C. H. (2019). *News framing effects: Theory and practice*. Taylor & Francis.
- Levi, M., & Stoker, L. (2000). Political trust and trustworthiness. *Annual Review of Political Science*, 3(1), 475–507.
- Lupia, A., & McCubbins, M. D. (1998). *The democratic dilemma: Can citizens learn what they need to know?* Cambridge University Press.
- Lupton, D. (1993). Risk as moral danger: The social and political functions of risk discourse in public health. *International Journal of Health Services*, 23(3), 425–435.
- Miller, J. M., & Krosnick, J. A. (2000). News media impact on the ingredients of presidential evaluations: Politically knowledgeable citizens are guided by a trusted source. *American Journal of Political Science*, 44(2), 301–315.
- Miller, J. M., Saunders, K. L., & Farhart, C. E. (2016). Conspiracy endorsement as motivated reasoning: The moderating roles of political knowledge and trust. *American Journal of Political Science*, 60(4), 824–844.
- Mondak, J. J., Hayes, M., & Canache, D. (2017). Biological and psychological influences on political trust. In S. Zmerli, & T. W. G. van der Meer (Eds.), *Handbook on political trust* (pp. 143–159). Edward Elgar Publishing.
- Nabi, R. L. (2003). Exploring the framing effects of emotion: Do discrete emotions differentially influence information accessibility, information seeking, and policy preference? *Communication Research*, 30(2), 224–247.
- Nelson, T. E., Clawson, R. A., & Oxley, Z. M. (1997). Media framing of a civil liberties conflict and its effect on tolerance. *American Political Science Review*, 91(3), 567–583.
- Nisbet, E. C., Hart, P. S., Myers, T., & Ellithorpe, M. (2013). Attitude change in competitive framing environments? Open-/closed-mindedness, framing effects, and climate change. *Journal of Communication*, 63(4), 766–785.
- Pan, Z., & Meng, J. (2016). The impact of media use on public trust in government: Evidence from China. *Mass Communication & Society*, 19(1), 79–98.
- Price, V., Tewksbury, D., & Powers, E. (1997). Switching trains of thought: The impact of news frames on readers' cognitive responses. *Communication Research*, 24(5), 481–506.
- Prosser, A. M. B., Judge, M., Bolderdijk, J. W., Blackwood, L., & Kurz, T. (2020). 'Distancers' and 'non-distancers'? The potential social psychological impact of moralizing COVID-19 mitigating practices on sustained behaviour change. *British Journal of Social Psychology*, 59(3), 653–662. <https://doi.org/10.1111/bjso.12399>

- Rosenfeld, D. L., & Tomiyama, A. J. (2022). Jab my arm, not my morality: Perceived moral reproach as a barrier to COVID-19 vaccine uptake. *Social Science & Medicine*. <https://doi.org/10.1016/j.socscimed.2022.114699>
- Schneider, I. (2017). Can we trust measures of political trust? Assessing measurement equivalence in diverse regime types. *Social Indicators Research*, 133(3), 963–984.
- Schuessler, J., Dinesen, P. T., Østergaard, S. D., & Sønderskov, K. M. (2022). Public support for unequal treatment of unvaccinated citizens: Evidence from Denmark. *Social Science & Medicine*. <https://doi.org/10.1016/j.socscimed.2022.115101>
- Schultz, F., Utz, S., & Göritz, A. (2011). Is the medium the message? Perceptions of and reactions to crisis communication via twitter, blogs and traditional media. *Public Relations Review*, 37(1), 20–27.
- Slothuus, R., & De Vreese, C. H. (2010). Political parties, motivated reasoning, and issue framing effects. *The Journal of Politics*, 72(3), 630–645.
- Valkenburg, P. M., Peter, J., & Walther, J. B. (2016). Media effects: Theory and research. *Annual Review of Psychology*, 67, 315–338.
- Vettenranta, S. (2015). Crisis communication and the Norwegian authorities. *Nordicom Review*, 36(1), 51–64. <https://doi.org/10.1515/nor-2015-0005>
- Vigso, O., & Odén, T. (2016). The dynamics of sensemaking and information seeking in a crisis situation. *Nordicom Review*, 37(1), 71–84.
- Ward, J. K., Alleaume, C., Peretti-Watel, P., Seror, V., Cortaredona, S., Launay, O., ... Ward, J. (2020). The French public's attitudes to a future COVID-19 vaccine: The politicization of a public health issue. *Social Science & Medicine*, 265, Article 113414.
- Wollebæk, D., Fladmoe, A., Steen-Johnsen, K., & Ihlen, Ø. (2022). Right-wing ideological constraint and vaccine refusal: The case of the COVID-19 vaccine in Norway. *Scandinavian Political Studies*, 45(2), 253.
- Wu, Y., Kuru, O., Baruh, L., Çarkoglu, A., Cemalcilar, Z., & Yıldırım, K. (2023). Partisan bias in COVID-19 conspiracy theories: News reliance and the moderating role of trust in health authorities. *Health Communication*, 1–20. <https://doi.org/10.1080/10410236.2023.2181678>
- Yaqub, O., Castle-Clarke, S., Sevdalis, N., & Chataway, J. (2014). Attitudes to vaccination: A critical review. *Social Science & Medicine*, 112, 1–11.
- Ye, X., Lee, H. H., Hui, K. H., Xin, M., & Mo, P. K. (2023). Effects of negative attitudes towards vaccination in general and trust in government on uptake of a booster dose of COVID-19 vaccine and the moderating role of psychological reactance: An observational prospective cohort study in Hong Kong. *Vaccines*, 11(2), 393.
- Zimba, O., & Gasparyan, A. Y. (2023). Designing, conducting, and reporting survey studies: A primer for researchers. *Journal of Korean Medical Science*, 38(48).