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COVID-19 Compliance and Media Consumption: A Longitudinal Study of Finland and the US During the First Year of COVID-19

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ABSTRACT

The article examines media consumption and compliance with health-protective measures during the COVID-19 pandemic. Two-wave, longitudinal surveys were conducted in Finland and the United States in April 2020 and October 2020, with a total of 1,380 participants (N = 1,380). The variables analyzed included daily consumption of different media channels (broadcast, print, and social media), health-protective behavior, and COVID-19 self-efficacy. The results indicated that individuals who consumed more than one media channel on a daily basis exhibited increased health-protective behavior and COVID-19 self-efficacy in both countries. One-sided and social media-based media consumption showed a negative association with health-protective behavior and COVID-19 self-efficacy in both countries. Finally, COVID-19 self-efficacy was found to mediate the relationship between media consumption and health-protective behavior in both countries, with a stronger effect observed in the United States.

KEYWORDS

Media consumption; COVID-19; Health-Protective Behavior; Cross-national; Longitudinal Study

Introduction

Before COVID-19 vaccinations became available, verified information on the disease and protective behaviors were considered as the most effective

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ways to curb the pandemic (The Lancet, 2020). Especially at the beginning of the pandemic, restricting social interaction and improving hygiene were priorities in controlling the epidemic. In this process, various media platforms had a key role in delivering information about the disease's risks and about protective and preventive actions that can help limit its spread (Dam et al., 2021; Liu, 2020). While broadcast, print and social media usually serve different purposes, each can effectively disseminate information about policymakers' and experts' decisions and recommendations (Schultz et al., 2011). However, abundant research points to socio-demographic and attitudinal differences between those consuming media content from various sources when compared to those who consume from limited sources.

This study explores how the consumption of different media channels affected people's ways of absorbing COVID-19–related information and influenced their adherence to recommended health-protective behaviors for the COVID-19 outbreak. We assumed that behavioral effects vary by the type and frequency of media consumed. By utilizing mediation analysis, we assess how different media consumption patterns increased COVID-19 self-efficacy and how this contributed to health-protective behavior in the United States (US) and Finland. The study was conducted with two-wave panel data collected among adult respondents of these two nations in six-month intervals in 2020. These data allow us to assess changes within and between individuals over time.

We argue that different media consumption habits affect how much information individuals receive about COVID-19 and how it spreads. In this respect, diverse and multisided media consumption may potentially increase COVID-19-related self-efficacy, resulting in increased health-protective behavior. At the same time, one-sided media consumption may potentially weaken self-efficacy associated with COVID-19, which in turn may have negative effects on health-protective behavior. Relying on our longitudinal comparative design, we consider that media behaviors also vary across nations (e.g. Reichelmann et al., 2021; Wang & Sun, 2010). Many existing studies have used cross-sectional data (e.g. Dam et al., 2021; Hung et al., 2021) and cannot distinguishing the effects of media consumption patterns on behavior within and between individuals, but we can fill this gap with our data.

Media choices have been studied from many different perspectives. For example, media content choices on one media platform, such as social media, has been a popular approach. Differences between media channels, which have slightly different tasks in conveying crisis information, have been examined (Park & Avery, 2018), and different media channels contribute to the development of people's crisis resilience (Price et al., 2022).

In this study, we focus on three media channels: print media channels, broadcast channels and digital media channels. We evaluate how diverse

consumption of different media channels correlates with health-protecting behavior. In addition, we evaluate the importance of individual channels for predicting health-protective behavior.

We present the following research questions:

- RQ1: How does the diversity of daily media consumption relate to health-protective behaviorin Finland and the US?
- RQ2: Is there a negative relationship between social media consumption and health-protective behavior in Finland and the US?
- RQ3: Does COVID-19 self-efficacy mediate the relationship between media consumption and health-protective behavior in Finland and the US?

We begin by conceptualizing media effects during a time of crisis and deriving hypotheses regarding the effect of media consumption and COVID-19 self-efficacy from recent literature. After that, we discuss the importance of research-based evidence in understanding different mechanisms behind protective behaviors among population groups during the pandemic.

Media Effects and Self-Efficacy in the Pandemic Crisis

The Importance of Media Consumption Information During a Crisis

Individuals' behavior in crisis is linked to awareness of the risks that associate with the threat of the situation (Cori et al., 2020; de Bruin & Bennett, 2020). During a crisis, different media are crucial for the authorities, experts, and scientists for sharing accurate and reliable information. How people consume media—e.g., by watching television, reading newspapers, and using social media – is a key factor in how well they have receive information about the risks associated with COVID-19 and how they comply with recommendations for preventing the spread of the virus.

Traditionally, the broadcast media had a central role in delivering public health agencies' information to the wider audience. Broadcast media can bring the authorities' communication directly to citizens, but they also select and frame the content of the authorities' communication to suit their own needs (Helfer & Aelst, 2016). However, during recent public health emergencies, the Internet has become the most frequently used source of information retrieval (Chew et al., 2010; Tsao et al., 2021). As user-generated content increases, social media has the potential to play a greater role in creating, filtering, and validating information (Beam et al., 2018; Bessi et al., 2015). Especially at the beginning of the crisis, social media could have been a key channel for users to find diverse information when institutionalized

media and experts did not have sufficient information (Chan et al., 2020; Cuello-Garcia et al., 2020).

The use of media as a key tool in crisis communication also highlights its impact as a channel. This means that the use of media has effects on people's perceptions and reactions to the crisis (e.g., Utz et al., 2013). The choice of media channels has a potentially strong impact on the results of crisis communication, such as public information retrieval and sharing, perceived crisis responsibility, and trust and confidence in authorities (Schultz et al., 2011; Xu, 2020). Previous studies have highlighted the role of diverse media consumption in absorbing crisis information and risk perceptions (Niu et al., 2022). Diverse media consumption, including traditional media and social media sources, tends to reduce polarization and expand the networks in which information flows (Dubois & Blank, 2018; Štětka et al., 2021). Thus, we can assume that media consumption patterns determine how well people understand the pandemic and the risks associated with it as well as different prevention methods. Accordingly, we hypothesize:

H1: *Diversemedia consumption increases health-protective behavior when compared to one-sided consumption.*

Crisis Information on Social Media

Social media plays a significant role in conveying crisis information (Mehta et al., 2017; Tsao et al., 2021), and can be helpful and supportive for individuals in a crisis (Sun et al., 2021). However, its use is also associated with many problematic factors that hamper information uptake, in particular, the assessment of information reliability (Bunker, 2020; Kouzy et al., 2020). For example, Xu's (2020) meta-analysis suggests that, compared to traditional media, using social media significantly reduces consumers' perceived crisis responsibility.

Social media networks often consist of similar-minded individuals and provide prolific platforms for spreading fake news that facilitates the dissemination of controversial information about, for example, terrorism, natural disasters, science, urban legends and financial information (Vosoughi et al., 2018; Zollo et al., 2015). By underlining this echo chamber effect of social media, multiple studies confirm that social media users tend to prefer information that corresponds to their preexisting attitudes and opinions (Bessi et al., 2015; Pulido et al., 2020). Moreover, various platforms' use of algorithmic filtering technology substantially affects how people encounter content online (Bakshy et al., 2015).

The user-generated information of social media also contributes to the replication and amplification of health communication content that reflects a community's beliefs and values rather than official and scientifically

confirmed information (Schillinger et al., 2020). Informal and inaccurate health communication may not have an immediate effect on people's behavior during the crisis; however, misinformation can have indirect and unexpected effects, including increasing distrust toward health science sources (Cuello-Garcia et al., 2020). Indeed, recent studies have suggested that the use of social media as a source of information about COVID-19 is correlated with stronger beliefs about conspiracy theories and less-protective behavior during the pandemic (Allington et al., 2021). Studies have also shown that false information is tweeted more but retweeted less compared to science-based evidence or fact-checked tweets, while science-based evidence and fact-checked tweets capture more engagement than mere facts do (Pulido et al., 2020). Consumer-produced information on social media can also lead to changes in previous beliefs and undermine trust in decision-makers, which also influences people's tendency to follow different health recommendations (Bunker, 2020; Islam et al., 2020).

Based on these notions, we assume that social-media-based media consumption relates to decreased compliance with health-protective behavior. However, we note that when social media is part of a diverse media diet, it can also be a useful way to obtain complementary crisis information (Hoffmann et al., 2015). A diverse media diet is a step toward obtaining diverse information and perspectives and thus prevents echo chambers and other negative network effects (Dubois & Blank, 2018). In this respect, the negative effect of social media on health-protective behavior is more likely to be apparent when media consumption is one-sided, and, for example, news is not consumed through newspapers or television in addition to social media. Accordingly, we hypothesize:

H2: *Social media –based media consumption decreases health-protective behavior.*

Media Use and Self-Efficacy

To understand behavioral effects of media consumption, we refer to general assumptions of social cognitive theory (SCT), a popular social – psychological theory used to explain the reciprocal organization of the environment and individual behavior. Originally introduced by Albert Bandura (1986), SCT offers a conceptual framework that aims to illuminate how individuals are embedded within their socio-cultural environments but also can control their own thoughts, affects and actions (Bandura, 2001). According to SCT, individuals learn by observing the actions of others, but the enactment of the learned behaviors depends on individuals' perception of their own capability to perform such action (e.g. Bandura, 1986). In SCT, the belief in

one's own capabilities and the ability to execute behaviors to attain certain goals is conceptualized as *self-efficacy* (Bandura, 1986, 2001).

Traditionally, the actions that inform individuals' self-regulation were perceived in the immediate environment, but in current societies, individuals are exposed to models of thought and behavior that transcend the face-to-face interactions of daily life (Bandura, 2001). Different media channels spread varying types of information that individuals may or may not use when considering whether to change their behavior, and individuals' media use patterns predict levels of self-efficacy relatively well (e.g. Hu et al., 2018; Safdar et al., 2021). This is because media content provides an essential source of information retrieval for citizens.

In addition, self-efficacy is recognized as an important factor that affects intentions and changes in health-related behavior (e.g., Bandura, 1977; Sheeran et al., 2016). Recent research has stressed the importance of individuals' performative capabilities in determining various behavioral outcomes in challenging or hazardous situations (Cattelino et al., 2021; Joie La Marle et al., 2021). Moreover, self-efficacy was an important predictor of protective behaviors in past epidemics (e.g., Bish & Michie, 2010), and several studies have demonstrated a relationship between self-efficacy beliefs and behavioral changes during the COVID-19 pandemic (e.g., Jørgensen et al., 2021; Lin et al., 2020).

Social media is especially notable here because different platforms enable the dissemination of accurate and false information alike about virtually anything. Utilizing the self-efficacy approach, we can identify whether certain media use patterns explain the levels of self-evaluations about one's own behavioral capabilities. We can also assess what role knowledge about one's own capabilities plays in the association between media use patterns and health-protective behavior. Building on SCT and empirical research on the subject, we assume that media use patterns directly affect COVID-19–related self-efficacy and that self-efficacy can work as a mediator in the associated media-consumption and health-protective behaviors. We therefore present the following hypotheses:

H3: *Diverse media consumption increases COVID-19 self-efficacy when compared to one-sided consumption.*

H4: *Social media –based media consumption decreases COVID-19 self-efficacy.*

H5: *COVID-19 self-efficacy increases health protective behavior.*

H6: *Self-efficacy mediates the association between diverse media consumption and health-protective behavior.*

Method

Study Context

Our research focuses on Finland and the US, which we expect to differ, particularly because of differences in political systems and media markets. First, the US is a two-party state, whereas Finland has multiple political parties. The winner-take-all nature of the US political system can fuel hyper-partisanship and the dissemination of infodemics (see Hawdon et al., 2020). Secondly, while both nations have highly concentrated media industries (Lutz, 2012), Finns are more likely to get their news from newspapers compared to Americans. The per capita daily circulation of newspapers and periodicals is approximately three times higher in Finland than in the US (The World Bank, 2022). Conversely, while approximately 53% of Americans say they get their news from social media sites (Shearer, 2021), only 45% if Finns report doing so (Watson, 2021). Therefore, although both nations are liberal democracies with relatively highly concentrated media markets, important differences in the media landscape between these two nations exist.

Participants

The data consists of two waves of longitudinal surveys conducted in Finland and the US. *T1* refers to the first wave of surveys conducted in April 2020 (April 25 to 29, 2020), and *T2* refers to the second wave conducted in late fall 2020 (November 6 to December 1, 2020). In both countries, each wave had approximately 1,500 respondents. For this study, the inclusion criteria were that participants returned both the first survey and the follow-up survey.[1] The follow-up survey involved a total of 767 respondents from Finland and 613 respondents from the US, resulting in 51.3% and 40.9% response rates by country, respectively.

Dynata administrated the initial surveys. All volunteer respondents were private citizens of the US and Finland. Participants were randomly recruited from the online panels using random digit dialing and other permission-based techniques. Dynata uses IP addresses to ensure participants only complete one survey, and it eliminates speeders through attention checks and mean-timing comparisons. Dynata also includes incentives to increase

[1]We performed attrition analyses for both countries to find statistically significant differences between those who participated in the follow-up surveys and those who dropped out. In Finland, follow-up participants were slightly older and more likely to be male, but there were no differences in the educational level of participants and dropouts. In the US, participants were also slightly older and more educated than dropouts, but the gender distribution was almost identical. Even though attrition affects the direct mean and proportion estimates, it typically does not have such a significant effect on the associations between variables over time (Gustavson et al., 2012).

participant interest and seriousness (e.g. Evans & Mathur, 2005; Lehdonvirta et al., 2021).

Measures

Table 1 shows descriptive statistics for the applied variables. The correlation matrices are given in supplement material (Table A1–Table A2).

Health-protective behavior was measured in a similar fashion as in Sedgwick et al. (2022) by assessing the respondent's tendency to comply with COVID-19 public health recommendations such as social distancing and hand washing. We used two statements: "I wash my hands more frequently now than before the pandemic" and "I am careful to stay at least six feet (two meters) away from others when I am in public" (pooled Cronbach alpha [α] = 0.67). The initial responses were given as a four-level ordinal scale: 1 = *not at all applicable*, 2 = *somewhat applicable*, 3 = *applicable* and 4 = *very applicable*. For analysis purposes, we created a sum variable with a range of 2–8.

We measured *COVID-19 self-efficacy* via two items related to processing COVID-19–related information. Participants were asked to rate their level of efficacy in following the recommendations and the ability to find

Table 1. Descriptive statistics of the applied variables.

	Fin				US			
	Round 1		Round 2		Round 1		Round 2	
Continuous variables	M	SD	M	SD	M	SD	M	SD
Health protective behavior (2–8)	6.59	1.32	6.46	1.35	6.88	1.36	6.65	1.52
Self-efficacy of Covid-19 (2–8)	6.67	1.16	6.57	1.25	6.58	1.43	6.42	1.61
Frequency of Internet usage (1–10)	7.49	1.52	7.49	1.51	7.64	1.88	7.59	1.87
Age (18–75)	49.79	14.20	50.30	14.22	53.10	13.78	53.53	13.88
Categorical variables	%		%		%		%	
Size of daily media repertoire								
0 platforms	2.5		3.5		3.9		6.4	
1 platform	9.5		12.6		17.6		21.8	
2 platforms	41.4		43.8		46.8		43.2	
3 platforms	46.7		40.1		31.7		28.6	
Daily media platform								
Broadcast	85.7		81.3		88.5		85.7	
Print media	87.3		84.0		65.4		57.8	
Social media	59.3		55.1		52.4		50.4	
Female	48.1		48.4		54.2		53.7	
Master degree	18.0		18.0		20.4		20.4	
Observations	771		771		609		609	

Ranges in parentheses.

information to prevent the spread of the coronavirus. Initial questions were "I can easily find information on how to prevent the spread of the coronavirus" and "It is easy for me to follow the instructions for restraining the coronavirus" ($\alpha = 0.71$). The responses were given as a four-level scale: 1 = *not at all applicable*, 2 = *somewhat applicable*, 3 = *applicable* and 4 = *very applicable*.

Size of daily media repertoire was defined by how many different media platforms respondents used on a daily basis in the past month. The media channels were television, radio, newspapers (online and print), periodicals (online and print), social network sites and discussion forums. We classified channels into three categories: 1) broadcast media, including television and radio, 2) journalistic media, including newspapers and periodicals and 3) social media, including social network sites and discussion forums. The initial responses were given on a scale ranging 1–10: 1 = *not once*, 2 = *once*, 3 = *more than once, but not weekly*, 4 = *once a week*, 5 = *several times per week*, 6 = *once a day*, 7 = *several times a day*, 8 = *once an hour*, 9 = *several times an hour*, and 10 = *all the time*. In this study, we were interested in daily media consumption habits, so we formed a binary variable by combining options from 6 to 10 from the original scale into the category 1, while the rest of the options were coded into the category 0.

When estimating the direct effects of daily media consumption, we used measures for categorization and respondents were classified based on whether they used "0," "1," "2" or "3" different platforms daily. In the additional country interaction analyses and mediation analyses, we combined categories 2 and 3 to measure the effect of multisided media consumption. Moreover, we created three dummy variables for each individual platform (broadcasting, print media and social media) to measure the interaction effect between individual media platforms and the media repertoire size.

Control variables included time of survey completion, internet usage, and sociodemographic variables, such as age, gender, and education. To consider the effect of time, we created two dummy variables, *T1* and *T2*, which separate the measurement points for April and October 2020, respectively. Internet use was assessed by examining how often respondents used the Internet according to a 10-point scale (1 = *never*; 10 = *all the time*). Age was measured in years and gender as binary. Education level was considered as a categorical variable with three levels: 1 = *primary/secondary*, 2 = *college* (in Finland this means university of applied science), and 3 = *university*. Age, gender, and education were considered as time-invariant variables, but we considered the within-individual variance of Internet use frequency over the time points.

Procedure

We conducted statistical analyses using STATA version 16.0. The data were hierarchical because individuals were nested within time points and countries. We conducted the analyses separately for Finnish and US respondents. To account for the correlated structure of panel data, we conducted hierarchic mixed-effects linear models using the *mixed* command with robust standard errors.

We performed similar but separate models when predicting health-protective behavior and COVID-19 self-efficacy. We first modeled temporal changes in both variables between the measurement points by introducing the variable T2. After that, we analyzed how changes in media consumption related to changes in health-protective behavior and COVID-19 self-efficacy when considering the effects of sociodemographic factors and frequency of Internet usage. The models included individual-level random intercepts with an unstructured covariance matrix to account for the correlated outcomes within respondents across repeated measurement points. The results are reported in Tables 2 and 3. In the results section, we also report the result of the country interaction conducted by adding the interaction term (multisided media consumption × country) to the model with the time variable and control variables.

In the second stage, we concentrated on the effects of individual media platforms. We performed an interaction analysis in which we isolated an individual platform's significance from the total number of platforms used. The aim here was to assess the second hypothesis regarding whether one-sided media consumption, especially social media–based, was negatively related to the dependent variables. To estimate the effect of the media platform, we standardized the dependent variables according to individual mean values by country. The main results of the interaction analysis were plotted using the *coefplot* command (Jann, 2014). As in the previous stage, we also considered the difference in media effects by country and conducted an additional interaction analysis, the results of which are reported in the text.

Finally, we conducted a multilevel mediation test to estimate the indirect path from multisided media consumption to health-protective behavior through COVID-19 self-efficacy. We followed Krull and MacKinnon's (2001) within-level mediation model (1➔1➔) to establish the effect of media consumption on health-protective behavior indirectly via self-efficacy by considering the random intercept. The significances of the effects were estimated with bootstrapping (500 replications). The mediation analysis was conducted using a user-written *ml_mediation* command.

Table 2. Predicting health protective behavior according to media consumption and control variables in Finland and the US. Mixed linear regression models.

	Health protective behavior			
VARIABLES	FIN		US	
Measurement point (ref: T1)	M1	M2	M1	M2
T2	−0.13**	−0.14***	−0.23***	−0.21***
	(0.04)	(0.04)	(0.06)	(0.06)
Size of daily media repertoire (ref: one platform)				
Nonexistent		−0.05		−0.26
		(0.23)		(0.29)
Two platforms		0.22*		0.16
		(0.10)		(0.11)
Three platforms		0.23*		0.37**
		(0.11)		(0.12)
Control variables				
Female (ref: Male)		0.47***		0.21*
		(0.08)		(0.10)
Age		0.02***		0.02***
		(0.00)		(0.00)
College (ref: Primary/Secondary)		0.00		0.11
		(0.09)		(0.11)
University degree (ref: Primary/Secondary)		0.03		0.38**
		(0.12)		(0.12)
Internet usage		0.05*		0.09***
		(0.02)		(0.03)
Constant		4.56***		4.61***
		(0.27)		(0.34)
Random effect:				
Intercept (Individual)		0.99		0.97
		(0.05)		(0.05)
Observations		1,523		1,218
Number of individuals		767		609

Notes: Estimates are unstandardized regression coefficients with robust standard errors in parentheses. *** $p < .001$; ** $p < .01$; * $p < .05$.

Results

The results in Table 2 suggest that health-protective behaviors decreased over time in both countries. Regarding H1, the models indicate that diverse media consumption was significantly associated with increased compliance with health-protective behavior during the COVID-19 outbreak in both countries. In both countries, diverse media consumption that included at least three platforms was associated with increased health-protective behavior when compared to daily media consumption of only one platform. In Finland, we also found that consumption of two media platforms was associated with an increased tendency to engage in health-protective behaviors.

The models indicate that women were more likely to engage in health-protective behaviors in both countries. Moreover, health-protective behavior was predicted by age in both countries. In the US, university degree and

Table 3. Predicting Covid-19 self-efficacy according to media consumption and control variables in Finland and the US. Mixed linear regression models.

	Self-efficacy of Covid-19			
VARIABLES	FIN		US	
Measurement point (Ref: T1)	M1	M2	M1	M2
T2	−0.10*	−0.10*	−0.17*	−0.14*
	(0.04)	(0.04)	(0.07)	(0.07)
Size of daily media repertoire (Ref: one)				
Nonexistent		−0.26		−0.25
		(0.22)		(0.31)
Two		**0.25***		**0.27***
		(0.10)		**(0.12)**
Three		0.18		**0.35****
		(0.10)		**(0.13)**
Control variables				
Female (Ref: Male)		0.22**		0.24*
		(0.07)		(0.10)
Age		0.01***		0.01**
		(0.00)		(0.00)
College (ref: Primary/Secondary)		0.04		0.10
		(0.08)		(0.11)
University degree (ref: Primary/Secondary)		0.09		0.31*
		(0.10)		(0.13)
Internet usage		0.05*		0.10***
		(0.02)		(0.03)
Constant		5.17***		4.43***
		(0.26)		(0.37)
Random effect:				
Intercept (Individual)		0.82		0.91
		(0.04)		(0.06)
Observations		1,523		1,218
Number of individuals		767		609

Notes: Estimates are unstandardized coefficients with robust standard errors in parentheses.
*** $p < .001$; ** $p < .01$; * $p < .05$.

active use of the Internet were also associated with increased compliance with health-protective behaviors. Further analysis suggests that the effect of multisided media consumption (two or three platforms) on health-protective behaviors did not differ between the US and Finland (B = .11, $p = .42$).

To test hypothesis 2, we analyzed the importance of individual media platforms in relation to the number of platforms used when predicting the tendency of health-protective behavior. Figure 1a presents the results of the interaction analysis. According to the results, social media–based media consumption was related to decreased health-protective behavior in Finland (B = −.30, $p = .01$) and the US (B = −.49, $p < .001$). An additional test indicates that the effect of social media–based consumption was not significantly different in the US compared to in Finland (B = .13, $p = .13$).

Next, we analyzed the role of self-efficacy to test hypotheses 3–6. The results shown in Table 3 indicate COVID-19 self-efficacy decreased in both countries between the measurement points. Regarding hypothesis 3, the results suggested that diverse media

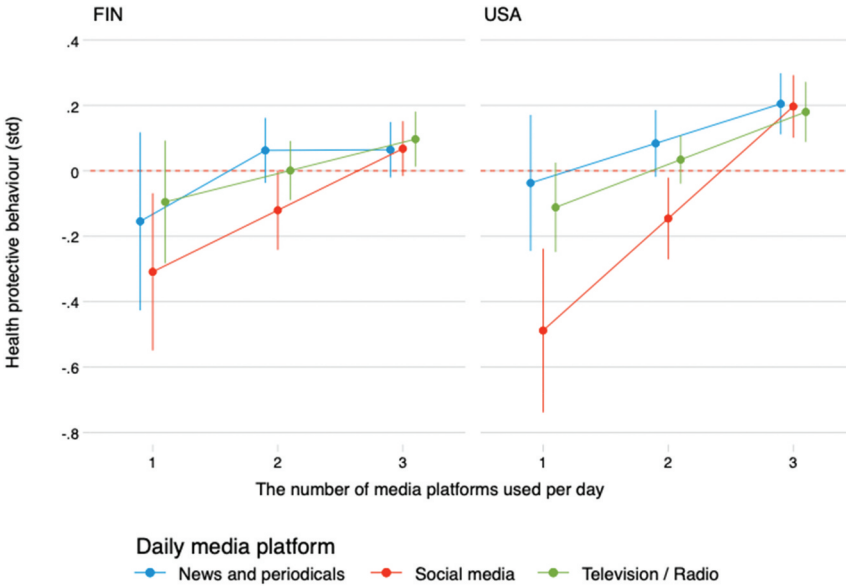

Figure 1. The effect of daily media consumption on health protective behavior according to the number of used media platforms in Finland and the US, predicted and country-standardized means from mixed linear regression models.

consumption was associated with increased COVID-19 self-efficacy, although in different ways for Finland and the US. In Finland, daily consumption of two media platforms was associated with increased COVID-19 self-efficacy, but we could not find a significant effect of three platforms. In contrast, COVID-19 self-efficacy increased more linearly with the size of the media repertoire in the US. The effects of the covariates were similar to the model of health-protective behavior: self-efficacy increased with age and among women in both countries. In the US, education and Internet use were significant predictors. According to the additional interaction analysis, the effect of multi-sided media consumption on self-efficacy did not differ between the US and Finland (B = .13, $p = .35$).

Regarding hypothesis 4, the results shown in Figure 2 reveal that the effect of social media – based media consumption on COVID-19 self-efficacy was negative in Finland (B = –.37, $p = .001$) and the US (B = –.36, $p = .011$). Based on an additional analysis, we could not find statistically significant differences between the countries (B = –.06, $p = .552$).

Finally, we conducted mediation analysis to identify whether the relationship between media consumption and health-protective behavior was indirect through Covid-19 self-efficacy. To test hypothesis 5, we assessed the effect of self-efficacy on health-protective behavior and found that self-efficacy

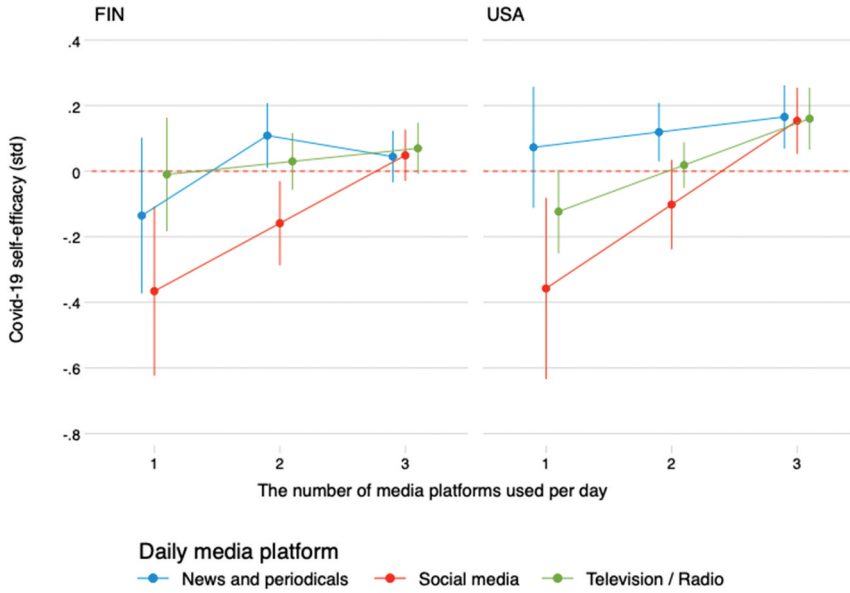

Figure 2. The effect of daily media consumption on self-efficacy of Covid-19 according to the number of used media platforms in Finland and the US, predicted and country-standardized means from mixed linear regression models.

Table 4. A mediation analysis of relationship between media consumption and health protective behavior through Covid-19 self-efficacy. Mixed effect REML regression.

	Finland				United States			
	B	SE	95% CI	P	B	SE	95% CI	P
Indirect effect of multisided media consumption through self-efficacy	.164	.040	.085–.243	<.001	.224	.062	.101–.348	<.001
Direct effect of multisided media consumption	.203	.083	.040–.366	.015	.087	.081	–.073–.247	.288
Total effect of multisided media consumption	.367	.092	.186–.548	<.001	.31	.101	.112–.510	<.001

B= Unstandardized coefficient; SE = Bootstrapped standard errors (500 replications); Omitted variable: one-sided media consumption, Adjusted: non-existent daily media consumption.

predicted health-protective behavior within individuals in Finland (B = .52, $p < .001$) and the US (B = .57, $p < .001$).

Regarding hypothesis 6, the results presented in Table 4 reveal that self-efficacy significantly mediated (B = .16, $p < .001$) the relationship between media consumption and health-protective behavior in Finland. Accordingly, self-efficacy accounted for 44.6% of the total association between multisided media consumption and health-protective behavior. The mediating effect was stronger in the US (B = .22, $p < .001$), where self-efficacy accounted for

72.1% of the total association between multisided media consumption and protective behavior.

Discussion

We presented several hypotheses for our analysis. We found support for our first argument that multisided media consumption patterns increased the likelihood of health-protective behavior (H1). Our results showed that health-protective behavior increased according to media consumption in both countries. The second hypothesis (H2) was also supported because social media–based media consumption decreased the likelihood of health-protective behavior. Finally, we found support for our hypotheses regarding the associations between media consumption and COVID-19 self-efficacy in both countries: multisided media consumption increased self-efficacy in both countries (H3), social media–based consumption decreased self-efficacy in both countries (H4), self-efficacy predicted health-protective behavior (H5) and self-efficacy significantly mediated (H6) the relationship between media consumption and health-protective behavior.

Overall, our findings point to the importance of a diverse media landscape and the use of various media sources during a crisis (Xu, 2020). The results provide support for recent applications of social cognitive theory by showing that the media potentially plays a significant role in building self-efficacy (Hu et al., 2018; Safdar et al., 2021). Our results confirm that people's media consumption reflects how they understand pandemic-related information and that is linked to how people comply with different recommendations. During the pandemic, one-sided media consumption can impair people's ability to assess the importance of different recommendations. In contrast, diverse media consumption can provide a base for understanding and certainty about what is happening. While this was not tested directly, compliance with health-protective behaviors shows an understanding of the risks of COVID-19; thus, our findings support the work of others who have found that multisided media consumption correlates with higher risk perceptions (Niu et al., 2022).

In addition, our analyses support previous work that predicts adoption of health-protective behaviors using collaboration theory (e.g. Sedgwick et al., 2022). Based on this model, individuals and the state enter a collaborative relationship, and the success of that relationship is partially determined by the extent to which citizens have the information they need about the pandemic (Sedgwick et al., 2022; see also Webster et al., 2020).

Furthermore, the results strengthen the earlier notions that social media consumption might be associated with negative behavioral outcomes if media consumption is focused exclusively on social media platforms. Considering previous research, social media consumption could be

expected to negatively associate with the uptake of crisis information. People tend to choose information on social media that they share with like-minded people (Cinelli et al., 2021; Pulido et al., 2020; Sacco et al., 2021), which is also algorithmically filtered to be suitable for users (Bakshy et al., 2015). In practice, this means that people who receive news exclusively from social media are not exposed to contradicting information, which limits their exposure to other discussions of the risks and suggested responses to contain those risks. According to our results, social media–based media consumption was linked to people's decreased ability to understand crisis-related information, which in turn will eventually be reflected in weaker health-protective behavior during the pandemic.

Although we conducted this study in two nations representing different political regimes, we did not have specific hypotheses regarding the findings. However, such institutional characteristics are visible in broadcast news contents as well as in social media platform use. According to our results, the total effect of media consumption on health-protective behavior and COVID-19 self-efficacy was similar in both countries. However, we found that the effect of media consumption on health behavior was more clearly mediated through self-efficacy in the US compared to Finland.

The result suggests that, for people in the US, the media has a more central role in producing their understanding of the general crisis, which is also reflected in protective behavior. Such interpretations have been suggested in international comparisons connected to news coverage on conflict situations (Barker, 2012) and community crises (Hawdon et al., 2012). In Finland, the effect of media consumption on health-protective behavior is not so purely based on the production of understanding. However, effects can be visible in other ways because confidence is high in institutions, including the traditional media as well as in experts and politicians (Kalogeropoulos et al., 2019; Torcal, 2017). This means political and scientific authorities might communicate their recommendations without including much information about the overall picture of the crisis. This offers one possible explanation as to why self-efficacy has a more notable effect in the US.

This study shows that traditional media, including television and radio, as well as various magazines and newspapers, remain key channels for absorbing information relevant to crises. The media have an important role to play in creating a common understanding of the crisis, which in turn is reflected in crisis resilience and in confidence that the situation can be overcome through collective efforts. However, on the contrary, the role of social media in a crisis needs to be considered further: People are increasingly using social media, and unilateral use of social media can reduce crisis awareness and health-protective behavior. Current research on media consumption related to COVID-19 has shown that daily

consumption can have negative effects on people's mental health compared to the consumption of traditional media (Price et al., 2022). Therefore, it is important to strengthen people's diverse media consumption patterns and to develop social media platforms to be better suited for crisis communication.

Our study relied on longitudinal surveys conducted in two countries, Finland and the US. Using this design, we could obtain estimates of individual-level effects that are more reliable, and we could model whether changes in media consumption influenced crisis behavior within individuals. With individual-level panel data, we can take the analysis one-step further and consider the effect of invariant factors between individuals over time. Naturally, further research covering other countries, which may show alternative media landscapes, is needed.

One of the key limitations of this study was the inability to distinguish among the different media content the respondents consumed. Therefore, we need more information on what social media platforms and content are essential for people's crisis awareness and adherence to official recommendations. We also need this information about traditional media channels, such as television and radio. It could be critically important to know if individuals consumed conservative or liberal media, for example, as these political positions have differing perspectives on how to best deal with public health crises.

A second limitation is that our data collection was temporally limited. Future studies will need to assess more precisely, what happened at different stages of the COVID-19 crisis. Our measurement period covered the first two waves of the COVID-19 pandemic, but eventually the crisis lasted much longer. This means that people's media consumption patterns and the consequences to their health-protective behavior might have changed significantly over time as the pandemic progressed.

Despite these limitations, we consider that our findings provide important contributions to our understanding of the relationship between media consumption, information, and practice of health-protective behaviors. Our data clearly shows the important role the media plays in keeping people well informed when dealing with health crises such as the COVID-19 pandemic.

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Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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