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FULL PAPER

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Abstract: This study investigates the relationship between attitude extremity and perceived exposure to diverse political arguments in the debate about COVID-19 health policy measures. Based on a comparative, cross-sectional survey in Germany and Switzerland, we show that extreme attitudes towards wearing face masks inhibit citizens' perceived diversity of arguments regarding the issue in both countries. This tendency is slightly more pronounced for supporters of mask-wearing than opponents. However, contrary to existing concerns about issue-specific echo chambers, even respondents showing strong attitude extremity still experience exposure to a relatively diverse range of arguments for and against wearing face masks.

Keywords: Echo chambers, filter bubbles, high-choice political information environments, international comparison, health policy measures, face masks against COVID-19.

Zusammenfassung: In dieser Studie wird der Zusammenhang zwischen der Einstellungsextremität und dem wahrgenommenen Kontakt mit vielfältigen politischen Argumenten in der öffentlichen Debatte rund um die gesundheitspolitische Maßnahme des Maskentragens zur Eindämmung von COVID-19 untersucht. Auf Basis einer Querschnittsbefragung in Deutschland und der Schweiz zeigen wir, dass extreme Einstellungen zum Tragen von Gesichtsmasken in beiden Ländern den wahrgenommenen Kontakt mit vielfältigen Argumenten zu diesem Thema einschränken. Diese Tendenz ist bei extremen Befürworterinnen und Befürwortern des Maskentragens etwas stärker ausgeprägt als bei Gegnerinnen und Gegnern. Gleichzeitig stehen der häufige Konsum journalistischer Medienangebote und die Nutzung sozialer Medien in einem positiven Zusammenhang mit der wahrgenommenen Argumentvielfaltsexposition. Entgegen bisheriger Befürchtungen zu themenspezifischen Echokammern sehen sich selbst Befragte, die extreme Einstellungen haben, immer noch einer relativ großen Bandbreite an Argumenten für und gegen das Tragen von Gesichtsmasken ausgesetzt.

Schlagwörter: Echokammern, Filterblasen, politische Informationsumgebungen, internationaler Vergleich, gesundheitspolitische Maßnahmen, Maskentragen gegen COVID-19.

1. Introduction

In democratic societies, citizens' exposure to diverse political viewpoints, i.e., their contact with a diverse set of opinions and arguments, is of central value. When we think of the political public sphere as an arena in which a broad array of opinions and arguments are gathered and debated (see e.g., Baden & Springer, 2017, p. 177, Benson, 2009a, p. 182) a multiperspectival public debate can serve as a viable alternative to the "unattainable goal" of objectiveness (Benson, 2009b, p. 402). Citizens are expected to form more rational opinions and to reach better-informed decisions when they base them on different perspectives (McQuail, 1992; Mill, 1989; Mutz, 2006).

Since the supply with online media outlets, social networking sites, instant messengers, and other sources of political communication has tremendously increased in the past decades and citizens enjoy great freedom in selecting from them (van Aelst et al., 2017), the question arises to what extent diversity actually makes its way to the people. By exploring the role of selective exposure and cross-cutting exposure in modern media environments (e.g., Garrett, 2009a; Zoizner et al., 2022), researchers have already begun to shed light on this aspect of modern communication environments and examined e.g., the diversity of views people expose themselves to (e.g., Zerback & Kobilke, 2022). One core finding in this field is that widespread viewpoint homogeneity on the side of the individual is not a very prevalent phenomenon (Bruns, 2019; Dubois & Blank, 2018).

There are, however, at least two research gaps that have not received much attention so far, despite their implications for our understanding of viewpoint diversity's role in democracy. The first aspect relates to the fact that existing studies mainly focus on a limited number of sources. Examples are analyses of the content diversity in online news or search engine results (Evans et al., 2022; Haim et al., 2018; Humprecht & Esser, 2018) or exposure to political disagreement on social networking sites (Bakshy et al., 2015). They offer valuable insights into the diversity of viewpoints of single information sources, but they do not provide a comprehensive picture of people's viewpoint environments. The latter encompass a broader and individually different array of sources online and offline, mediated and interpersonal, which have to be considered to get a more complete picture. The second gap relates to the way viewpoint diversity is usually operationalized (see Baden & Springer, 2017 for an overview). Most common are analyses of variations in slant or tone across messages or outlets (e.g., Evans et al., 2022; Hayes & Guardino, 2010) which show how balanced a debate is in terms of general support or opposition, but they do not reflect the underlying spectrum of rationales.

In the current study, we address these research gaps by focusing on arguments as central elements of rational public discourse (Habermas, 1996). We argue that in order to interpret viewpoint diversity as a quality dimension of public discourse, empirical analyses should also investigate the diversity of arguments used to back them up. Furthermore, instead of examining argument diversity on the supply-side, we focus on recipients as the final piece of the "diversity chain" (McQuail, 1992) and their individually perceived exposure to argument diversity. To explain individual differences in perceived argument diversity, we concentrate on attitude

extremity, which has been repeatedly suspected to inhibit diversity exposure (Bruns, 2019; Wojcieszak & Rojas, 2011), but has been rarely empirically tested (see Zerback & Kobilke, 2022).

The results presented here are based on two cross-sectional online surveys on COVID-19 conducted in November 2020 in Germany (N = 1,025) and Switzerland (N = 730) during the second wave of the pandemic. Respondents were asked to report the frequency of recent contacts with specific arguments supporting or opposing wearing face masks. Based on their answers, we calculated individual diversity scores reflecting the level of perceived argument diversity.

2. The role of perceived argument diversity in public discourse

Diversity has always played an important role in democratic media systems, particularly on the supply side (Benson, 2009b). In the context of mediated communication, it can refer to the heterogeneity of media outlets and ownership (structural diversity), of content provided by media outlets (content diversity), and of content selected and used by citizens (exposure diversity) (Napoli, 1999). More recently scholars have emphasized the need to look at the concept from an audience perspective, especially in times of fragmented media consumption (Helberger & Wojcieszak, 2018, Loecherbach et al., 2020). This includes calls for a stronger inclusion of *perceived* exposure diversity, as the individual recollection of exposure diversity. Perceived exposure diversity can differ from actual exposure diversity since it is the result of individual cognitive information processing (Hoffmann et al., 2015). Nevertheless, it is expected to be particularly relevant for individual opinion formation, attitudes, or behaviors.

Different forms of perceived exposure diversity can be identified depending on the underlying characteristics or traits used to determine it. In the field of political communication, common objects of interest are political issues, actors, and viewpoints, because diversity along these dimensions is expected to fulfill specific democratic functions such as the representation of ideas and societal groups, thereby facilitating rational political opinion formation. Among these characteristics, viewpoint diversity is often seen as the most relevant aspect and a guiding principle of journalism and media policy (Napoli, 1999; Wolfgang et al., 2021).

Viewpoint diversity as a concept so far "notoriously eludes definition and measurement" (Baden & Springer, 2017, p. 177). Previous definitions describe it as the "variation of viewpoints" (Haim et al., 2018, p. 332) or "the plurality of perspectives" (Evans et al., 2022, p. 3). Others name specific aspects they consider part of the concept such as "ideas, perspectives, attributions, opinions, or frames" (Voakes et al. 1996, p. 585). In the current study, we follow the latter and focus on the diversity of arguments as a specific aspect of viewpoint diversity, which – despite their normative importance for public discourse – has not received much scholarly attention so far. According to deliberative democratic theories, rational discussions are based on the exchange of factual information and arguments regarding a certain policy (Peters, 2007; Habermas, 1984). While opinions themselves are often not falsifiable, arguments should be the actual elements that compete with each other in the political public sphere. This assumption is rooted in the normative

idea that in a marketplace of ideas, it is the "unforced force of the better argument" that leads to more rational decisions (Habermas, 1996, p. 306). A broader spectrum of arguments entering a debate is considered to increase rationality and legitimacy because the final arguments have prevailed in the process.

3. Attitude extremity and perceived argument diversity exposure

One of the most frequently discussed topics in current debates on diversity is that citizens may increasingly find themselves in homogenous information environments (Bruns, 2019; Flaxman et al., 2016). Given the opportunity to select from a broad array of information and sources, it is feared that people will choose whatever content matches their attitudes and interests (Prior, 2005). Algorithmic filtering is suspected to intensify this tendency, by recommending content online based on users' interests, attitudes, social network, or prior online behavior (Pariser, 2011). Empirical research offers little if any support for this notion (Bruns, 2019). Rather, studies show that the degree of homogeneity varies across individuals (Brundidge, 2010; Dubois & Blank, 2018; Garrett, 2009a; Garrett et al., 2013). In the following, we argue that these variations can partly be explained by attitude extremity serving as an inhibitor of perceived argument diversity exposure.

A promising starting point to determine the role of attitude extremity is research on (political) selective exposure. The theory predicts that people tend to turn to media sources and content that match their attitudes (Sears & Freedman, 1967; Stroud, 2008), because they want to avoid cognitive dissonance (Garrett & Stroud, 2014; Stroud, 2008). Cognitive dissonance should be experienced particularly pronounced by people with extreme attitudes, which (by definition) deviate to a greater extent from the more moderate viewpoints in most political media content. Consequently, selective exposure should be more likely to be observed for them (Knobloch-Westerwick & Meng, 2009) and ultimately reduce argument diversity exposure (van der Wurff, 2011).

But there are also arguments against this assumption (see Zerback & Kobilke, 2022). For instance, people with extreme attitudes could anticipate situations in which they would have to defend their opinion against others. This could motivate them to actively seek alternative views to prepare themselves for such encounters (Garrett, 2009b; Scheufele et al., 2004). Moreover, attitude extremity is positively correlated with other attitude dimensions, particularly attitude importance (Liu & Latané, 1998; Wojcieszak, 2012), which serves as a strong motivator to keep oneself informed about an issue (Boninger et al., 1995) and to elaborate on issue-related messages (Petty & Cacioppo, 1990). Hence, people with extreme political attitudes could be particularly well-informed and aware of arguments from both sides of a debate.

Empirical studies on the relationship between attitude extremity and selective exposure are surprisingly rare and reflect the theoretical ambiguity described above. Brannon et al. (2007) e.g., found that stronger attitudes led to a higher interest in attitude-consistent information (see also Stroud, 2010). Others, such as Knobloch-Westerwick and Meng (2009) could not find any effect of attitude extremity on message selection, duration of exposure, or experienced disagreement (Wojcieszak,

2012). Winter et al. (2016) on the other hand, observed that participants with more extreme attitudes, who were told that they would have to defend their position after exposure, slightly preferred attitude-consistent over non-consistent information. Wojcieszak (2012) found that those holding extreme political views possess a larger issue-specific argument repertoire, but only regarding arguments supporting their own position. Analyzing longitudinal survey data from the US between 2000 and 2012, Rodriguez et al. (2017) show that ideological extremity increased partisan selective exposure, but only for conservatives. Moderate and strong liberals, on the other hand, did not differ in the strength of selective exposure. All in all, none of the empirical work so far suggests that attitude extremity increases mediated argument diversity exposure. If anything, they point in the opposite direction in that extremity leads to increased avoidance of counter-attitudinal and/or exposure to attitude-consistent information.

Just as for media consumption, political attitudes also play an important role in the composition of an individual's everyday interpersonal communication. The tendency that contacts between individuals with similar political attitudes occur at a higher rate than among individuals with dissimilar attitudes (McPherson et al., 2001, p. 416) – has been observed in offline (Mutz & Martin, 2001) and online social networks (Ackland & Shorish, 2014; Boutyline & Willer, 2017). Citizens' personal social networks tend to be homogeneous regarding different sociodemographic, behavioral, and attitudinal characteristics and therefore inhere the potential to limit perceptions of the social world (McPherson et al., 2001, p. 415), including issue-specific arguments. Some authors have already pointed out that extreme political attitudes may substantially increase the probability of ending up in less diverse social environments, providing the social reassurance that is needed to stabilize or even intensify extreme attitudes (Geiß et al., 2021, p. 665). Particularly relevant for our study, prior empirical research suggests that citizens with more extreme political leanings tend to encounter less opposing political viewpoints in everyday discussions than moderates (e.g., Morey et al., 2018; Mutz, 2006, p. 33). Furthermore, Boutyline and Willer (2017) present empirical evidence, that more conservative and more extreme individuals both show higher levels of political homophily on Twitter compared to the moderate and less extreme. Although research suggests a diversity-inhibiting effect of attitude extremity in interpersonal environments, this should not lead to the conclusion that people with extreme attitudes generally live in homogenous social cocoons (Zerback & Kobilke, 2022). Particularly online social networks possess a great potential to encounter diverse political viewpoints, despite the strong political leanings of some of their members. Brundidge (2010) e.g., argues that in social online networks weakened social boundaries increase the likelihood of exposure to alternative political viewpoints. The absence of geographic limitations, the close connection between online news media and interpersonal discussion, and the connections with socially more distant individuals through weak ties should theoretically contribute positively to argument diversity exposure.

Only very few studies so far have empirically investigated the role of attitude extremity in viewpoint diversity exposure or perception. For instance, Zerback and Kobilke (2022) empirically show, based on three-wave online panel survey data,

that individuals with more extreme attitudes toward immigrants experience less diverse viewpoints and that this tendency is especially pronounced for affective attitude extremity. Given the theoretical and empirical research summed up above, we assume that attitude extremity should reduce perceived argument diversity exposure.

> *H1: People with extreme attitudes towards mask-wearing will perceive less argument diversity exposure on the issue than those with moderate attitudes.*

4. The role of systemic characteristics

Exposure to political information, including the diversity of arguments is also shaped by the national context, particularly by the media and political systems (Benson & Hallin, 2007; Hallin & Mancini, 2004; Humprecht & Esser, 2018). As such, national information environments also affect the role of attitude extremity. Systems with low diversity levels (or high consonance) make it more difficult to evade arguments supporting the dominating view (Noelle-Neumann & Mathes, 1987). Hence, those holding extreme attitudes that contradict the dominating view have a harder time avoiding disagreement. This should also apply to systems where internally diverse outlets are strong (e.g., those with strong public service media). Here, citizens – regardless of their attitudes – should be exposed to diverse arguments to at least some extent.

In the following, we will systematically compare Germany and Switzerland to identify similarities and differences between their media and political systems that potentially affect national levels of argument diversity. We will hypothesize about the role of individual attitude extremity for perceived argument diversity exposure.

4.1 Media system characteristics

Although Switzerland and Germany both represent the democratic-corporatist model in common media system typologies and therefore share many similarities (Hallin & Mancini, 2004; Humprecht et al., 2022), they also differ in certain regards that could affect perceived argument diversity (most similar systems design; see Table 1). Both countries are characterized by (1) an inclusive media market (i.e., a high reach of online and offline news among citizens) – with Switzerland showing higher levels of inclusiveness than Germany, (2) strong state support for public service media and high levels of media freedom, and (3) relatively low degrees of political parallelism – with lower levels in Germany (Humprecht et al., 2022).

All three media system dimensions are potentially related to argument diversity exposure. Hallin and Mancini (2004, p. 29) argue that media systems with higher degrees of parallelism offer higher external content diversity, while systems with lower levels of parallelism lead to outlets with more internally diverse content (e.g., public service media). In fact, higher levels of political parallelism are associated with lower levels of citizens' exposure to political perspectives they disagree with (Goldman & Mutz, 2011). Furthermore, it can be argued that high degrees of media freedom and strong state support of internally diverse outlets make it more

difficult for citizens to avoid certain political arguments. Therefore, argument diversity exposure should be higher in media systems with substantial state support for internally diverse outlets, especially when such outlets have a high reach (inclusiveness).

Table 1. Opportunity structures for argument diversity exposure in Germany and Switzerland

	Germany	Switzerland	Possible implications for argument diversity exposure
Media system dimensions			
Inclusiveness of the media market	High	Very high	The more inclusive a media system, the higher the probability of citizens' argument diversity exposure.
State support	High	High	High state support for public service media, increases the probability of citizens' argument diversity exposure.
Political parallelism	Very low	Low	Low political parallelism increases the probability of citizens' argument diversity exposure.
Political system dimensions			
Type/ model of democracy	Liberal representative democracy; elite-/ executive-oriented	Semi-direct consensus democracy; deliberative/ legislative-oriented	Deliberative democracy and direct-democratic elements increase the probability of citizens' argument diversity exposure.
Electoral system	Semi-proportional	Proportional	Proportional systems include a larger number of parties. Larger party spectrums in a country yield a greater potential for argument diversity exposure.

4.2 Political system characteristics

A country's political system can affect citizens' conceptions and understandings of the political public sphere (Ferree et al., 2002; Humprecht & Esser, 2018). Switzerland and Germany share many commonalities on a political system level. Both countries are stable liberal democracies with a federalist political system, and both show characteristics that align with the deliberative as well as the liberal-representative model of democracy. However, there are also certain nuances in which they differ. Switzerland with its more pronounced direct-democratic elements is considered to be an ideal type of a consensus democracy, and its electoral system is characterized by proportional representation. Germany, on the other hand, as a more representative democracy has a slightly more majoritarian system with a

semi-proportional electoral system (see e.g., Lijphart, 2012, p. 244; Linder & Müller, 2021; Norris, 1997). As Marcinkowski and Donk (2012) highlight, direct democracy is often linked to public deliberation because popular votes invite citizens to exchange political arguments. Therefore, Switzerland might offer more favorable opportunity structures for citizens' exposure to diverse arguments than Germany. Additionally, in more representative political systems, it is assumed that decisions by accountable representatives (i.e., political elites) best serve democracy and that they should have a stronger position in public discourse (Humprecht & Esser, 2018). This reflects the concept of *reflective diversity*, in which the public sphere should mirror the actual proportions of political arguments within a society while from a deliberative point of view, all actors and arguments should receive a similar amount of attention as reflected in the concept of open diversity (Joris et al., 2020; McQuail, 1992). Empirically, Humprecht and Esser (2018, p. 1835) e.g., show that in Germany, executive actor groups are represented more often in political news coverage in comparison to Switzerland, where actors of the legislative receive more attention. Udris et al. (2023) further show that political reporting in German and Swiss public service media reflects two different models of democracy. The focus on government is strongest in the more representative model of Germany, while there is a stronger presence of parliament and organized civil society in Switzerland which is more in line with deliberative democracy (Udris et al., 2023). Furthermore, Jandura et al. (2019) find evidence that in Switzerland, the right-wing populist Swiss People's Party (SVP) is favored in media coverage over all other parties in terms of its media presence while in Germany no such preferential treatment of one political party can be identified.

4.3 Contextual Factors

In both countries, the COVID-19 pandemic has had a positive effect on individuals' need for information, which led to an increase in the consumption of news media (van Aelst et al., 2021). During the time this study was conducted, media in Germany and Switzerland showed relatively little criticism of the authorities, and pro-government actors dominated reporting (Eisenegger et al., 2021; Maurer et al., 2021). Switzerland and Germany invoked similar policies in response to the first pandemic wave in the spring of 2020. However, their health policy strategies started differing significantly in the second wave when the current study was conducted (in the fall of 2020). While Germany took a more stringent approach at the time, including an earlier and more extensive face mask obligation, Switzerland's health policy heavily relied on personal responsibility and was characterized by comparatively loose restrictions (Zimmermann et al., 2022). Additionally, in Switzerland, a referendum against the COVID-19 law was launched on 4 October 2020, which was supported by some popular proponents and regional sections of the right-wing populist SVP (Swissvotes, 2021). This possibly led to an increase in the presence of arguments against wearing face masks in Switzerland compared to Germany.

Considering these systemic characteristics and empirical findings, citizens in both Switzerland and Germany should experience comparably high levels of political

argument diversity exposure during the period of study, which should also show in their perceptions of it. Given the higher inclusiveness of the Swiss media market (e.g., the higher reach of online and offline media among working class and women), the stronger deliberative element, and a stronger presence of the SVP as a mask-critical political party acting as a counterweight to the wide support for mask-wearing, we expect a slightly more diverse argument environment than in Germany. On the other hand, the lower degree of political parallelism in Germany could increase perceived argument diversity exposure. Against this ambiguous background, we explore potential differences regarding perceived argument diversity exposure between Swiss and German citizens and the role of individual attitude extremity by posing the following research questions:

> *RQ1: Is there a difference in perceived political argument diversity exposure between Swiss and German citizens?*
> *RQ2: How does the national context affect the relationship between attitude extremity and perceived argument diversity exposure?*

There is reason to assume that the relationship between extreme attitudes and exposure to diverse political viewpoints might also depend on people's partisanship (Jost et al., 2018). Research in the US has shown that liberals and conservatives not only differ in their political stance, but also in fundamental personality traits and their need to manage uncertainty (e.g., Jost, 2017). Particularly relevant for selective exposure to viewpoints, conservatives are less willing to tolerate ambiguity and are more motivated to avoid uncertainty. Burghartswieser and Rothmund (2021) find indications of such a conservative bias in the context of the so-called "refugee crisis" in Germany. Hence, extreme conservatives are more inclined to turn to likeminded and therefore less diverse viewpoints than extreme liberals (Jost et al., 2003; Rodriguez et al., 2017). With regard to wearing masks, polls conducted during the pandemic show that especially supporters of the German far-right party AfD held particularly negative attitudes towards facemasks (Infratest dimap, 2022, for other national contexts see also Courtice et al., 2023; Mallinas et al., 2021). Such a higher prevalence of politically conservative individuals among mask opponents could further increase the inhibiting effect of attitude extremity on perceived argument diversity. However, there are reasons why instead extreme mask supporters could experience lower levels of argument diversity. Most importantly, the greater supply of pro-mask arguments in the media and within the general population should have made it much easier for them to avoid contact with arguments from the opposing camp. Given this ambiguity, we explore potential differences between extreme opponents and extreme supporters of facemasks by posing the following research question:

> *RQ3: Is there a difference in the effect of attitude extremity on perceived argument diversity between mask supporters and opponents?*

5. Method

The study presented here is based on two cross-sectional online surveys on COVID-19 conducted in Germany and the German-speaking part of Switzerland in November 2020. Respondents in both countries (N_{DE} = 1,025; N_{CH} = 730) were recruited by a professional survey company (Dynata) using country-specific quotas for age, gender, and education according to national census data at that time. No cross quotas were used. Mask-wearing was chosen as a topic because the issue was discussed in a controversial manner, in that political parties and other public actors took different stands on it in public, resulting in an information environment where a wide spectrum of different views was available. Overall variance in argument supply is an important pre-condition to study the effects of individual factors on experienced diversity exposure because a complete lack of argument diversity on the supply side would necessarily have resulted in homogenous exposure.

Table 2. Overview of arguments supporting and opposing the wearing of masks

	Supporting arguments		**Opposing arguments**
1	Masks have a signal effect and increase awareness for hygienic behavior.	7	Masks are an interference with personal freedom.
2	Masks reduce transmission by infected persons without symptoms.	8	Masks do not prevent the spread of COVID-19.
3	Masks reduce the spread of aerosols or fine droplets.	9	Masks make people more careless.
4	Masks can prevent the spread of COVID-19.	10	Wearing masks is unhygienic because bacteria and viruses collect in them.
5	Masks prevent me from contracting COVID-19.	11	Masks make communication between people difficult.
6	Masks prevent me from infecting others with COVID-19.	12	Wearing masks causes health problems such as breathing problems, headaches, or dizziness.

Measures

Perceived argument diversity exposure as the dependent variable was measured by asking respondents how frequently they encountered twelve arguments (six pro / six contra) regarding wearing masks during the pandemic during the past two months (0 "Never" to 6 "Very frequently"; see Table 2 for an overview of the arguments). The arguments were identified based on media coverage and online discussion forums that dealt with COVID-19. The search process was terminated as a sufficient saturation of the argument spectrum was reached, i.e., when no substantially different arguments were found. The argument-specific frequency scores were used for the calculation of Shannon's H as a diversity measure. In our

case, scores could range between 0 (maximum homogeneity) and 2.485[1] (maximum diversity) (see McDonald & Dimmick, 2003) and reflect the variety and balance of the opinion distribution.

Attitude extremity was measured by a mean index based on four single items (e.g., "I am convinced of the usefulness of the mask to contain the pandemic.") measuring respondents' attitudes towards mask-wearing. For each item, respondents indicated their agreement on a 5-point Likert scale reaching from 1 "do not agree at all" to 5 "totally agree", α = .81. Attitude extremity was then calculated as the absolute difference of the index score from the scale midpoint (3), resulting in an extremity score that ranged from 0 (no attitude extremity) to 2 (maximum attitude extremity) (e.g., Wojcieszak, 2012), M = 0.88, SD = 0.65.

Controls. Six additional control variables entered our model. Respondents' *frequency of media use* and *interpersonal communication* have been shown to correlate with viewpoint diversity exposure (van der Wurff, 2011) and therefore are included. Media consumption was measured for five media types (quality media, tabloid media, public service television news, commercial television news, alternative media). In addition, six single items were used to measure how often respondents used various social media platforms (Facebook, Twitter, Instagram, Snapchat, TikTok, and YouTube). A principal component analysis (varimax rotation) produced a single factor solution. Therefore, a mean index of general social media use frequency was created (M = 2.45, SD = 1.74, α = .82). Interpersonal communication was measured for everyday face-to-face communication and conversations via social messengers. For every source (mediated and interpersonal), respondents indicated the number of days they use it during an average week (0 "never" to 8 "seven days a week"). Since prior studies found that diversity exposure also depends on motivational factors (Dubois & Blank, 2018; van der Wurff, 2011), we also measured respondents *issue involvement* (mean index consisting of three items, each measured on a 5-point Likert scale reaching from 1 "do not agree at all" to 5 "totally agree" (e.g., "I am interested a lot in COVID-19"; mean index consisting of three items each measured on a 5-point Likert scale reaching from 1 "do not agree at all" to 5 "totally agree"), α = .85. Finally, we control for prior *issue-specific knowledge* (sum index counting the correct number of answers to six closed-ended factual knowledge questions relating to the pandemic (e.g., "Who decided to make masks mandatory in public transport?") Finally, we control for standard sociodemographic variables (age, gender, education). The exact wording of all questions and items can be found in the online appendix.

6. Results

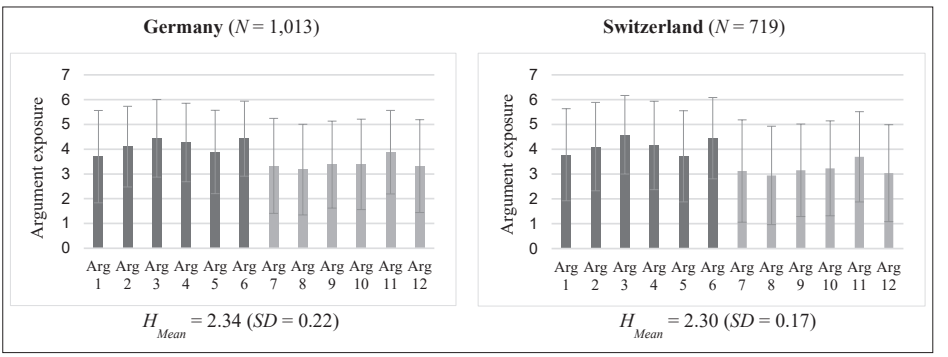
RQ1 asked for differences in perceived argument diversity exposure between both countries. Figure 1 shows the mean frequencies of respondents' perceived exposure to each argument. As can be seen, both distributions are relatively balanced and cover the entire range of arguments. Although supporting arguments were encoun-

1 The upper limit of the unstandardized Shannon's H depends on the number of total categories of the underlying variable (in our case twelve) (McDonald & Dimmick, 2003).

tered slightly more often, this indicates a similar and relatively high level of perceived argument diversity exposure which is also reflected by the almost identical Shannon's *H* scores in each country (H_{GER} = 2.34; SD_{GER} = 0.22; H_{CH} = 2.30; SD_{CH} = 0.17). However, as the standard deviations (indicated by the black lines) show, not every respondent experienced an equally diverse argument distribution.

We will now look at the potential correlates of perceived argument diversity exposure, including a test of *H1* which predicted that it is lower in individuals with extreme attitudes towards mask-wearing. Table 3 shows the results of a linear regression analysis with the Shannon's *H* scores as the dependent variable. In both countries, those with less extreme attitudes showed higher levels of perceived argument diversity exposure (*H1* supported).

Figure 1. Frequency of argument exposure in Germany and Switzerland



Note. Dark grey columns represent mean frequencies of arguments supporting mask-wearing, light gray columns those of opposing arguments. Lines represent standard deviations.

Regarding *RQ2*, the negative relationship between attitude extremity and experienced argument diversity exposure was slightly weaker in Switzerland, however, the interaction between respondents' residence and attitude extremity turned out to be non-significant, $F(1, 1679) = 1.635$, $p = .201$. Furthermore, other factors did not consistently show up in both countries, particularly specific types of media use. In Switzerland, frequent consumption of quality media was associated with a more diverse argument exposure, as was social media use. When both samples are pooled, positive relationships can also be observed for tabloid newspaper use (as in Germany). In addition, females (particularly in Germany) perceive a smaller spectrum of argument exposure.

Table 3. Correlates of perceived argument diversity exposure (linear regression, unstandardized coefficients)

	Switzerland (N =698)						*Germany (N =996)*						*All (N =1.695)*					
	Model 1			*Model 2*			*Model 1*			*Model 2*			*Model 1*			*Model 2*		
	b	*LCI*	*UCI*	*b*	*LCI*	*UCI*	*b*	*LCI*	*UCI*	*b*	*LCI*	*UCI*	*b*	*LCI*	*UCI*	*b*	*LCI*	*UCI*
Sociodemographics																		
Gender (1 = female)	**-.031**	-.058	-.008	**-.034**	-.060	-.013	-.012	-.037	.017	-.015	.011	-.042	**-.021**	-.042	-.003	**-.024**	-.042	-.007
Age	.000	.000	.001	.001	.000	.002	.000	-.001	.001	.000	.001	-.001	.000	-.001	.001	.000	.000	.001
Education (1 = univ. entr. qualif.)	-.008	-.032	.016	-.006	-.031	.018	.008	-.019	.035	.009	.037	-.015	.004	-.016	.022	.005	-.012	.023
Motivation & knowledge																		
Issue-specific involvement	.012	-.013	.039	.015	-.010	.038	**.022**	.002	.046	**.021**	.001	.046	.015	-.002	.030	**.016**	.001	.032
Issue-specific knowledge	-.004	-.015	.011	.004	-.007	.018	-.006	-.017	.006	.005	-.005	.016	-.005	-.012	.005	.005	-.003	.013
Media use																		
Quality media	**.006**	.001	.010	**.006**	.001	.010	.000	-.005	.005	.001	-.004	.005	.003	-.001	.006	.003	.000	.006
Tabloids	.003	-.001	.008	.003	-.002	.007	**.007**	.001	.013	.003	-.002	.008	**.007**	.003	.010	**.004**	.001	.008
PSB TV news	.003	-.003	.009	.001	-.005	.006	-.004	-.010	.002	-.005	-.011	.002	.003	-.001	.006	.001	-.002	.004
Commercial TV news	-.002	-.007	.002	-.002	-.006	.002	.004	-.001	.009	.004	.000	.009	.000	-.004	.004	.000	-.003	.003
Alternative media	.006	.000	.012	.004	-.002	.010	-.001	-.010	.005	-.001	-.008	.005	.001	-.005	.006	.000	-.004	.005
Social media	**.010**	.004	.027	**.009**	.001	.023	.006	.000	.022	.007	-.001	.018	**.007**	.004	.020	**.007**	.001	.016
Interp. communication																		
Personal messengers	-.001	-.006	.004	-.001	-.006	.003	.006	-.000	.011	.005	.000	.010	.003	-.001	.006	.002	-.001	.006
Face-to-face	-.010	-.022	.000	-.008	-.019	.000	-.002	-.012	.007	-.003	-.012	.006	-.005	-.013	.002	-.005	-.013	.001
Attitude extremity	---		---	**-.096**	**-.117**	**-.072**	---		---	**-.112**	**-.135**	**-.088**	---		---	**-.107**	**-.123**	**-.089**
ΔR^2				**.12*** **						**.11*** **						**.11*** **		
R^2	**.06*** **			**.18*** **			**.05*** **			**.16*** **			**.05*** **			**.16*** **		

Note. Confidence intervals are based on 1000 bootstrap samples, significant coefficients are printed bold.

In the next step of our analysis, we answer *RQ*3 and test, if the diversity inhibiting pattern is equally pronounced for mask opponents and mask supporters. Table 4 (see online appendix) duplicates the previous analysis while using dummy variables representing the two camps and the distinct levels of attitude extremity within them. Again, we observe a highly significant negative relationship between attitude extremity and perceived argument diversity exposure. Hence both, extreme supporters and extreme opponents of mask-wearing are exposed to a narrower argument spectrum compared to those with more moderate attitudes. Interestingly, and contrary to our assumption, the relationship is more pronounced for the supporters. To get a more detailed impression of this pattern, we reran the analysis using the general *tendency* of argument exposure as a dependent variable (for details see Table 5 in the online appendix). Results show a highly significant relationship between the attitude towards mask-wearing and the *tendency* of argument exposure. This means that those holding more positive (negative) attitudes experience an increased exposure to mask-supporting (mask-opposing) arguments. This supports the assumption, that the lower diversity levels observed before are indeed due to a reduced exposure to arguments from the opposing camp. An additional test shows that this tendency was more pronounced in Germany than in Switzerland, $F(1, 1684) = 11.901$, $p = .001$.

7. Discussion

In the current study, we examined the role of attitude extremity as a potential inhibitor of perceived argument diversity exposure. Our results contribute to the existing knowledge in the field by showing that, although most people in most cases experience diverse information environments (Brundidge, 2010; Bruns, 2019; Dubois & Blank, 2018), attitude extremity can narrow the perceived spectrum of arguments. However, our data also show that even extreme attitudes do not make people completely unaware of opposing arguments, therefore fears that individuals with extreme political attitudes might experience perfectly homogenous environments are just as exaggerated as with regard to the general population. Adding to that, we saw that during the second wave of the COVID-19 pandemic, a time when people felt a particularly high need for information and orientation, overall perceived argument diversity was relatively high. It remains an open question, to what extent the relationship between attitude extremity and experienced argument diversity exposure is specific to such exceptional situations. For example, in a situation like the pandemic (high information supply, high need for information) with a high level of argument diversity, we would expect a much stronger relationship between attitude extremity and perceived argument diversity exposure. In routine periods, however, when the media report on several issues and where the need for information differs across people, attitude extremity should be more influential among those who are involved in a certain issue. Future research could shed light on such varying conditions.

Our results further show that the effect of attitude extremity on perceived argument diversity exposure is stronger among supporters than opponents of mask-wearing. A possible explanation could be, that due to a greater supply of pro-mask

arguments in the media and within the general population, it has been much harder for mask opponents to avoid contact with arguments from the other camp – even when their rejection of masks was extreme – leading to a more balanced argument exposure perception. Furthermore, individuals' attitude towards mask-wearing affects the *tendency* of argument exposure. This means that those holding more positive (negative) attitudes experience an increased exposure to mask-supporting (mask-opposing) arguments, which supports the assumption, that the lower diversity levels observed for the extreme groups are indeed due to reduced exposure to arguments from the opposing camp. An additional test shows that this tendency was more pronounced in Germany than in Switzerland. This could be explained by the political system and media system dimensions outlined before (e.g., the higher inclusiveness of the Swiss media system or the more deliberative element of its political system) as well as specific contextual factors, e.g., a stronger presence of mask opponents and their arguments in the Swiss media due to the collection of signatures for the COVID-19 law referendum (Swissvotes, 2021).

Although it was not the core focus of our study, because others already addressed the topic (Dubois & Blank, 2018; van der Wurff, 2011), we observed that the use of certain media sources was associated with higher levels of perceived argument diversity exposure. Particularly the consumption of news from quality and partly tabloid media as well as social media use were associated with higher experienced diversity levels. This, on the one hand points to the democratic importance of journalistic media (particularly quality journalism), where the presentation of diverse views is regarded as a central value (Wolfgang et al., 2021). On the other hand, it underlines the role of social media sources as platforms, where contacts with socially more distant individuals, holding different views is more likely. However, we cannot be certain in this regard, since we do not know what types of content people were actually exposed to. In addition to media use, people's individual motivation, especially a higher involvement in the issue contributes to a more diverse exposure to arguments from both sides of the spectrum.

Of course, our study has some limitations, which we like to stress to improve the interpretation of our results and to highlight potential paths for future research. First, our measure of argument diversity exposure relies exclusively on respondents' self-assessments and is therefore prone to potential biases (see e.g., de Vreese & Neijens, 2016). Most importantly, individual recall of contacts with pro or contra arguments on mask-wearing could be incomplete or biased in terms of valence. Our measure also does not capture how these arguments were evaluated or framed by the source putting them forward, nor how recipients evaluated them themselves. However, when it comes to the effects of argument exposure, e.g., on opinion formation, both aspects can be critical. Second, our study has focused on the antecedents of perceived argument diversity, particularly attitude extremity. Thereby, other important aspects that should receive scholarly attention are left out. Specifically, researchers should also ask about the consequences of perceived argument diversity, e.g., how it affects individual opinion formation or behavior (e.g., participation). Third, our results are based on cross-sectional data that does not allow for causal claims. Most importantly, we cannot rule out the possibility that attitude extremity is a result of exposure to a less diverse spectrum of arguments rather

than vice versa. In addition, both variables could also form a reciprocal relationship (Slater, 2007). Hence, future studies should use panel designs to shed light into the further investigation of this relationship. Moreover, our study offers no insights about the role of actual argument diversity as a source of people's perceptions. Although we included media consumption and interpersonal communication as potential sources in our models, we can only speculate about the diversity of arguments offered by them. Linking the actual supply of argument diversity and its perception would further contribute to our processual understanding of the concept. However, providing a comprehensive picture of actual argument diversity on an individual level that takes account of personalized content and interpersonal communication offline is a challenging problem that still needs to be solved. Anyway, one must be aware that perceptions of argument exposure – like other perceptions of media use and content – are prone to biases, such as social desirability and difficulties in recollection (e.g., Jürgens et al., 2020; Prior, 2009).

Finally, one must keep in mind that diversity is not an end in itself but that its assessment depends on the normative framework applied (Helberger et al., 2018). Moreover, argument diversity can clash with other values such as relevance. For example, one could argue that not every argument should receive the same weight because some are stronger or more justified than others. The discussion about false balance (Boykoff & Boykoff, 2004) is an example of such a conflict between diversity and relevance. At the same time, excluding seemingly weak arguments right from the beginning of a debate conflicts with an inclusive public discourse and may even affect the perceived legitimacy of the outcome (Emerson, 1963, Mill, 1989).

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