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FULL PAPER

Social influence on social media. How majority and in-/outgroup opinions on personal newsfeeds impact opinion formation on new issues

Social Influence in sozialen Medien. Wie Meinungen der Mehrheit und In-/Outgroup im persönlichen Newsfeed die Meinungsformung zu neuen Problemen beeinflussen

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Abstract: Social media platforms play a central role in shaping public opinion on political and societal issues. Users are constantly exposed to a mix of algorithmically and socially filtered content, which can influence how they perceive new topics and form attitudes. Drawing on theories of heuristic information processing, social impact, and social identity, an experimental study explored the impact of opinions in a social media newsfeed on users' selective attention, evaluation, and opinion formation. A 2x2 design with N = 197 participants, integrating forced and selective exposure elements, confronted subjects with a novel (fictitious) issue and a feed of six related opinion posts. Two factors were analyzed: (1) whether posts – in favor or against the issue – came from voices that participants identified as ingroup versus outgroup, and (2) whether the pro or con posts were in the majority versus minority. Results show that posts from ingroup voices do not receive more attention than outgroup posts but are perceived as more credible in general and are more persuasive under certain conditions: When ingroup posts are in the majority and when users are low-involved. The persuasive effect also occurs when the ingroup is hardly related to the issue under discussion. This underscores that no impermeable filter bubbles are needed to influence user opinions on social media. According to the results, persuasion takes place on social media when individuals are predominantly confronted with the opinions of people with whom they feel close and connected–regardless of whether this connection is topic-specific or not.

Keywords: Social media, social influence, social cues, selective exposure, majority influence, ingroup-outgroup bias, persuasion, low-involvement

Zusammenfassung: Soziale Medien spielen eine zentrale Rolle bei der Meinungsbildung zu politischen und gesellschaftlichen Themen. Nutzer sind ständig einer Mischung aus algorithmisch und sozial gefilterten Inhalten ausgesetzt, die beeinflussen können, wie sie neue Themen wahrnehmen und Einstellungen bilden. Basierend auf Theorien der heuristischen Informationsverarbeitung, des sozialen Einflusses und der sozialen Identität untersucht die Experimentalstudie den Einfluss von Posts in einem Social-Media-Newsfeed auf die selektive Aufmerksamkeit, Bewertung und Meinungsbildung der Nutzenden. Ein 2x2-Experiment konfrontierte die N = 197 Probanden in einer Kombination aus Forced- und Selective-Exposure-Design mit einem neuartigen (fiktiven) Thema und einem Feed aus sechs zugehörigen Meinungsbeiträgen. Zwei Faktoren wurden analysiert: (1) ob die Posts–für oder gegen das Thema – von Stimmen

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stammten, die die Teilnehmenden als Ingroup oder Outgroup identifizierten, und (2) ob die Pro- oder Contra-Posts in der Mehrheit oder Minderheit waren. Die Ergebnisse zeigen, dass Beiträge von Ingroup-Stimmen zwar nicht mehr Aufmerksamkeit erhalten als Outgroup-Beiträge, aber generell als glaubwürdiger wahrgenommen werden und unter bestimmten Bedingungen persuasiver wirken, und zwar wenn Ingroup-Beiträge in der Mehrheit sind und wenn die Nutzenden ein geringes Involvement aufweisen. Der Persuasionseffekt tritt auch dann auf, wenn die Ingroup kaum einen Bezug zum diskutierten Thema hat. Dies unterstreicht, dass keine undurchlässigen Filterblasen erforderlich sind, um die Meinungen von Menschen in sozialen Medien zu beeinflussen. Den Ergebnissen zufolge findet Persuasion in sozialen Medien statt, wenn Individuen überwiegend mit den Meinungen von Menschen konfrontiert werden, denen sie sich nahe und verbunden fühlen – unabhängig davon, ob diese Verbindung themenspezifisch ist oder nicht.

Schlagwörter: Soziale Medien, sozialer Einfluss, Social Cues, Selective Exposure, Mehrheitseinfluss, Ingroup-Outgroup-Bias, Persuasion, Low-Involvement.

1. Introduction

Despite a growing corpus of research on persuasive and polarizing effects of social media use caused by algorithmic personalization, filter bubbles, echo chambers, etc., empirical results remain inconsistent and strongly depend on methodological approaches and contexts (for overviews, see Bruns, 2019; Hartmann et al., 2025; Kubin & von Sikorski, 2021; Möller, 2021; Schweiger, 2025; Törnberg, 2022). Even the underlying mechanisms are still controversial: First, how much opinion-consonant and dissonant information and opinions do social media platforms display to individual users? In other words, how permeable are the so-called filter bubbles? Although research is not uniform, there is agreement that users are mainly exposed to consonant opinions on social media, but also often see dissonant content (Bakshy et al., 2015; Törnberg, 2022). Second, which criteria shape users' selective attention to and processing of specific content on a social media newsfeed (Ohme & Mothes, 2020), and how does this influence their opinion formation?

Theoretical approaches suggest that individuals select and process incoming information and opinions incompletely and superficially, i.e., heuristically. This is particularly true in low-involvement situations, when users have little interest in certain content or have no time or opportunity to thoroughly select and process it (Petty & Cacioppo, 1986). Studies have shown that social media use often occurs under low-involvement conditions, which increases the likelihood of heuristic processing (e.g., Metzger & Flanagin, 2013). This contrasts with the requirements of democratic societies, where informed citizens who are willing to engage with complex issues and form a qualified opinion are needed.

Heuristic selection and processing of information is either guided by users' characteristics or striking stimuli within the incoming information – so-called cues – or a combination of both. Accordingly, some approaches focus on attitude persistence and reinforcement: Partisan selective exposure, confirmation bias, and motivated reasoning imply that users tend to defend their opinions by selecting and processing new information that fit their identities, interests, and attitudes (for an overview, see Sude & Knobloch-Westerwick, 2022). While these approaches emphasize attitude reinforce-

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ment, others highlight processes of persuasion and attitude change through social influence: The spiral of silence theory, for example, predicts that users are influenced by the climate of opinion, i.e., their perception of the majority opinion (Noelle-Neumann, 1993). Online-specific approaches address social cues (e.g., individual endorsement or the number of likes, comments, or recommendations) as heuristics shaping the perception, processing, and impact of social media posts (e.g., Karnowski et al., 2017).

We posit that one of the most influential social cues is the origin of social media content users encounter – whether posts come from so-called ingroups or outgroups. This concept refers to social identity theory, assuming that individuals categorize themselves as members of identity groups (ingroups) as opposed to other groups (outgroups). Thus, they favor ingroup opinions (ingroup favoritism) and are mainly influenced by them (ingroup persuasion effect; for an overview, see Spears, 2021). We believe that ingroup favoritism and persuasion significantly shape user behavior on social media as they connect users' core values and social identities with social cues and heuristics.

This study empirically tests these assumptions, focusing specifically on how ingroup versus outgroup cues influence opinion formation in a typical social media setting: When individuals are confronted with a new political issue on their social media feed and try to form their own opinion. In a 2x2 interactive experiment, we analyze how social media users perceive and evaluate opinion posts from ingroup versus outgroup members (factor 1) that are in the majority versus minority in their feed (factor 2) and how they are influenced by them. Additionally, we will consider user-involvement, the similarity in content between the in- and outgroups on a specific topic, and selected user-characteristics.

2. Social media use, heuristics, and selective attention

When users scroll through a social media feed, they usually scan a never-ending stream of posts or stories from different sources on a variety of issues. Kümpel (2021) describes this with a five-dimensional framework: Users have *incidental* (unfocussed and non-directed) and *granularized* contact (exposure to individual news items without broader context) with *non-exclusive* content (different sources and types of content are directly competing for users' attention), which is selected and ranked by *algorithmic personalization* and *social recommendations and interactions*.

Two implications are relevant: First, due to algorithmic and social personalization (Beam, 2014), social media feeds do not provide users with a balanced and representative selection of news where they can observe the *factual* opinion climate (e.g., Zerback & Fawzi, 2016). Accordingly, most users expect news on social media that is "personally important" to them (Newman et al., 2021). Second, the abundance, diversity, and granularization of non-exclusive sources, content types, and issues form a "high-choice media environment" (e.g., Strömbäck et al., 2022). As individuals' attention and ability to process information are limited, this often leads to information overload (e.g., Knobloch-Westerwick, 2008), which can correlate with 'news snacking' (Meijer & Kormelink, 2014), "characterized by briefly checking headlines and teasers rather than an in-depth involvement with information." (Ohme & Mothes, 2025, p. 2). When posts are linked to full news stories, users rarely click on them (Boczkowski et al., 2018); some platforms, like Instagram or TikTok, do not even offer this functionality. Often, users

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do not intentionally seek information but expect relevant news to find them incidentally (Gil de Zúñiga et al., 2017). In summary, social media users often skim newsfeeds with low attention and little engagement (Ohme & Mothes, 2025), especially on mobile devices (Keib et al., 2022; Molyneux, 2018).

What does that mean for information selection in such an environment? If individuals are in a typical mode of low-involved social media use and expect personalized content, they will not actively search for opinion-consonant content as this would require high mental effort. Instead, they will essentially rely on the algorithmic and social personalization of platforms. As dual-process theories (elaboration-likelihood model; Petty & Cacioppo, 1986; heuristic–systematic model; Chaiken, 1980) predict, individuals in low-involvement situations are likely to select information heuristically. Typical heuristics include the salience and cognitive availability (through familiarity, repeated or recent contact) of an option (e.g., Gigerenzer et al., 1999). Thus, users primarily pay attention to information that is salient and/or familiar to them.

Selective exposure to media content is mainly driven by users' topical interest or involvement (e.g., Kaiser et al., 2018; Kümpel, 2019; Ohme & Mothes, 2020) and need for opinion-consonant information (e.g., Dahlgren et al., 2019; Winter et al., 2016). But how do users predict the political leaning of a specific post, especially when they are low involved? Or do they rely on the system-customization of a feed and pay the same attention to all items? While some studies confirm partisan selective attention on social media (e.g., Bakshy et al., 2012; Iyengar & Hahn, 2009; Kaiser et al., 2018; Messing & Westwood, 2014; Turcotte et al., 2015), other studies find only weak or no effects (Flaxman et al., 2016; Nelson & Webster, 2017; Sülflow et al., 2019).

3. Social media, information processing, and opinion formation

This does not answer the question whether social media users process all posts/opinions in the same way or whether they are guided by the presentation of opinions and process ideologically consonant content more favorably than dissonant content (motivated reasoning; Kahan, 2013).

The spiral of silence theory supports the first position, claiming that humans observe their social environment, try to figure out the *public* opinion concerning a specific issue, and may be influenced by the majority opinion (Noelle-Neumann, 1993). Studies show that online users are influenced by perceived opinion ratios on social media platforms when forming their own opinions (Ross et al., 2021), even if these platforms do not offer a balanced representation of the factual opinion climate.

Other approaches emphasize that individuals' information processing and opinion formation are shaped by the presentation and opinion consistency of available content. From persuasion and media effects research, we know that the source of a message heavily influences the persuasiveness of the information (Hovland, 1951). This leads to *social cues* on social media, which are pieces of information about the users who produce, share, endorse, or discuss content, i.e., those who can be regarded as message sources in the broadest sense. Social cues are usually presented directly next to a post and are highly visible. Several studies have shown that they influence how users perceive and process social media posts and, thus, foster social influence (Anspach, 2017; Dvir-Gvirsman, 2019; Messing & Westwood, 2014; Ohme & Mothes, 2020; Winter et al., 2016).

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How social cues influence information processing and persuasion depends on several factors: The most important is the *relationship between a recipient and a source;* the underlying recognition heuristic seems to be highly effective. Research has shown that individuals preferably select (Bakshy et al., 2012; Kaiser et al., 2018; Turcotte et al., 2015) and are especially persuaded by *strong ties,* i.e., sources with which they have a close relationship and frequent exchange (Anspach, 2017; Bakshy et al., 2012; Xu, 2013). The same applies to sources perceived as *opinion-leaders* (Turcotte et al., 2015), *credible* (e.g., Knobloch-Westerwick et al., 2015; Sülflow et al., 2019; Turcotte et al., 2015), that have a high *social position* (e.g., Haas & Unkel, 2015) and are *similar* to the recipient (Sundar & Nass, 2001). Other studies have demonstrated that the *common partisanship* between source and user leads to selective exposure (e.g., Iyengar & Hahn, 2009; Kaiser et al., 2018; Messing & Westwood, 2014), reinforces persuasive effects (e.g., Dahlgren et al., 2019; Knobloch-Westerwick et al., 2015; Knobloch-Westerwick, Mothes, et al., 2015), and increases the probability to publicly endorse and share messages (e.g., Yardi & Boyd, 2010).

4. Social media groups as ideological camps

In times of affective polarization in many Western democracies, even in multiparty systems (for a review, see Leininger et al., 2023), the ideological camp from which a message derives is probably a powerful social heuristic. Known actors and recognizable markers of ideological camps are media brands, elite actors as politicians or economic leaders, other influencers, and interest groups. They all may serve as cognitive shortcuts for ideological alignment. On social media platforms, like Facebook, ideological camps are often represented as public groups (e.g., 'NoVac', 'MAGA' or 'Green life'). Users may encounter posts from such groups because they have liked them or platform algorithms recommend their content. When a group name is recognizable or semantically suggestive, users may feel connected or opposed to it. Given that social media platforms are designed to foster connection and community (Carr, 2017), the perceived affiliation of a group likely functions as a salient social cue in online opinion formation.

According to social identity theory (Tajfel, 1978), individuals derive their self-concept not only from personal attributes but also their group memberships. This leads to a fundamental distinction between ingroups – to which one belongs – and outgroups – from which one distances oneself. A central implication is *ingroup favoritism*, whereby individuals evaluate ingroup members and their positions more favorably, thereby enhancing their self-esteem (meta-analysis by Rivera et al., 2024). Consequently, people are more likely to accept and be persuaded by arguments from ingroup sources – a phenomenon known as the *ingroup persuasion effect* (Cakanlar & White, 2023; Fielding et al., 2020; Lin et al., 2018; Mackie et al., 1992; McGarty et al., 1994; Wei et al., 2023). In contrast, outgroup arguments typically have no effect or may even reinforce existing attitudes (Cakanlar & White, 2023). These mechanisms can contribute to collective group polarization (de Benedictis-Kessner et al., 2019; Isenberg, 1986). The extent to which selective exposure follows this pattern likely depends on additional factors, including content valence (Knobloch-Westerwick & Hastall, 2010).

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As empirical research on ideological ingroup and outgroup influence in social media environments remains limited, we draw on general theories and findings. According to Sia et al. (2002), ingroup–outgroup effects are more pronounced online than in face-to-face interactions. This is explained with the SIDE theory (Spears & Lea, 1994), which suggests that the less personal information users have about group members (e.g., appearance, clothing, para- and nonverbal cues), the more they perceive them as prototypical representatives of their group, and the less they view them as autonomous individuals. As a result, when groups interact online, their behavior is shaped primarily by group-based identities and stereotypes, while individual characteristics fade into the background.

The strength of the ingroup persuasion effect depends on individual, group, and situational characteristics (Aronson et al., 2021; Cialdini & Goldstein, 2004). In the context of social media, two factors appear especially relevant and are examined in our experiment – both concern the relationship between individuals, groups, and the political issue under discussion:

First, the *relationship between the individual and the issue*. Research indicates that individuals with low *issue involvement* are especially susceptible to ingroup influence (e.g., Chartrand & Bargh, 1999), as they are less motivated to invest cognitive effort and therefore tend to adopt their ingroup's opinion. This effect may be amplified by issue-related uncertainty, when the issue is unfamiliar or complex and users feel unable to decide without additional information (Walther et al., 2002). In both cases, individuals are more likely to rely on ingroup-based heuristics.

Second, the *relationship between group and issue*. Sometimes, individuals obtain information from groups that are salient to the issue; in other cases, involved groups have little to no relevance to the topic. For example, a climate policy debate may involve climate activists and climate skeptics – both highly salient groups. The same issue could also be discussed by less relevant groups (e.g., "Citizens against Government") or groups unrelated to the topic (e.g., "Beautiful Vacations" or "Beatles Fans"). How the perceived issue-related salience of in-/outgroups affects their influence remains unclear. Brewer (1979) theorized that a more pronounced ingroup-outgroup distinction strengthens favoritism. In contrast, a meta-analysis by Mullen et al. (1992) found no link between a group's attribute relevance and its persuasive power.

5. Hypotheses

To derive specific research questions and hypotheses from the assumptions discussed, let us figure out a typical usage situation. When a new issue of societal relevance arises and is discussed on social media, users encounter a variety of arguments, worldviews, framings, and opinions from different actors. Due to algorithmic and social personalization, users are predominantly exposed to posts from ingroup voices with similar attitudes in their newsfeeds, but may also see posts and comments from outgroup voices.

An increased selective attention to posts from ingroup voices – and thus salient and/or familiar voices – is conceivable but not yet empirically supported. Here, selective attention is understood and measured as a binary construct (attention vs. no attention) and should not be confused with more elaborate forms of cognitive processing.

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RQ1: Do social media posts from ingroup voices receive more attention than posts from outgroup voices?

Due to the role of in-/outgroup sources of posts as social cues, ingroup favoritism, and the ingroup persuasion effect, we expect individuals to evaluate posts from ingroup voices as more credible and be more influenced by them than outgroup voices.

H1: Social media posts from ingroup voices are perceived as more credible than posts from outgroup voices.

H2: Social media posts from ingroup voices are more persuasive than posts from outgroup voices.

The next hypothesis draws from the spiral of silence theory and refers to the persuasive effect of the climate of opinion.

H3: When social media posts confirming a position are in the majority (and posts opposing this position are in the minority), they are more persuasive than when they are in the minority.

What happens when the ingroup voices are in the majority and the outgroup voices in the minority, and vice versa? How does the distribution of ingroup and outgroup opinions on a Facebook feed influence an individual's opinion formation? The next hypothesis compares the relative strength of these cues, if ingroup-based social cues are more persuasive than majority position alone. According to the logic of the spiral of silence and ingroup persuasion theories, both mechanisms are likely to reinforce each other.

H4: When social media posts from ingroup voices are in the majority, they are more persuasive than when they are in the minority.

As discussed, ingroup favoritism and persuasion are expected to be especially strong under low-involvement conditions, when users' behavior is guided by social heuristics. In the experiment, we could not manipulate the individual *usage* involvement. However, we could realistically expect a satisfying variance of *issue* involvement among participants. When *issue involvement* is low, social media use should occur under low-involvement conditions. Conversely, a higher issue involvement should also increase situational involvement and thus decrease users' tendency to apply heuristics. Individual issue involvement was controlled as a proxy for usage involvement to test whether subjects were in a low-involved news-snacking situation or not. As research has also indicated, a higher degree of issue-related uncertainty should additionally increase the probability of ingroup effects. Both moderators were tested.

H5: (a) The lower the issue-related involvement and (b) the higher the degree of issue-related uncertainty, the more persuasive ingroup voices are in comparison to outgroup voices.

Although the empirical research is unclear at that point, the predicted effects might also depend on perceived relevance of the groups involved with respect to the topic under discussion. Since this study focuses on subjective group perceptions and their effects,

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we ask whether perceived issue-related salience – rather than objective relevance – moderates ingroup or outgroup effects.

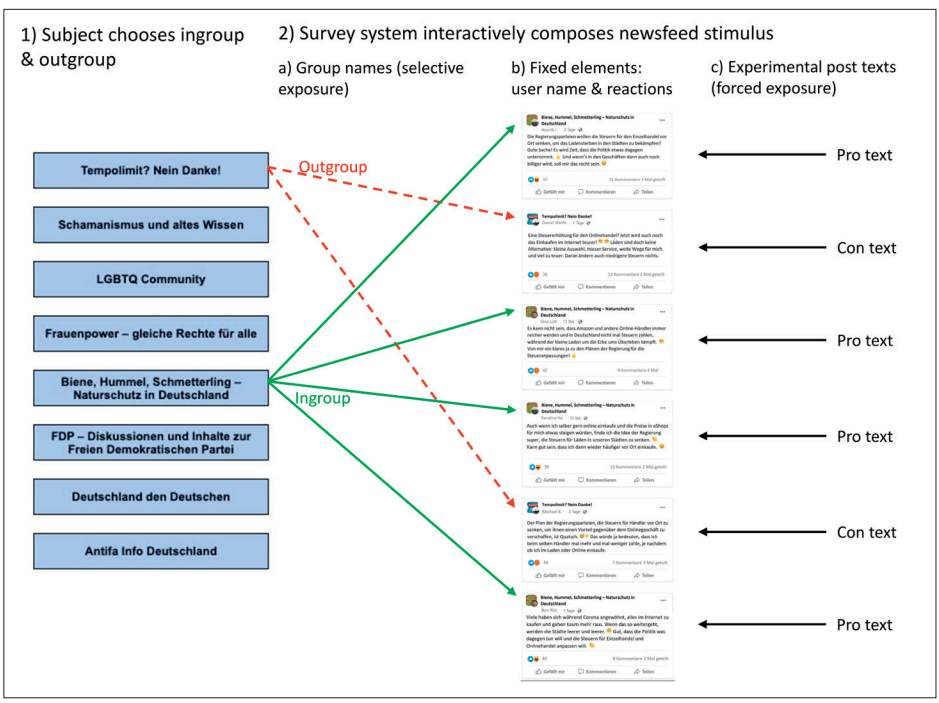
> *RQ2: Are the effects of in-/outgroup voices on individual opinion formation moderated by the perceived issue-related salience of the in-/outgroups?*

6. Method

6.1 Overview

The hypotheses and research questions were tested with an online experiment that combined selective and forced exposure elements (for procedure, see Figure 1). This design has only recently become feasible due to online survey tools like SoSci Survey. We employed a so-called PICA design (Preference-Incorporating Choice and Assignment Design; de Benedictis-Kessner et al., 2019). Participants were first asked to select one Facebook group they most identified with (ingroup) and one they least identified with (outgroup) from a list of eight fictitious groups. They were then exposed to a feed with posts about a new, fictitious political issue from members of these groups. Two experimental factors were manipulated: (1) the opinion expressed by the ingroup (pro vs. con), with the outgroup taking the opposite position; and (2) the majority opinion in the feed (pro vs. con).

Figure 1. Experimental PICA procedure



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6.2 Experimental design and procedure

At the beginning of the online survey (for German questionnaire, see Appendix in OSF), respondents were presented with eight fictitious Facebook groups with a broad array of ideological orientations (e.g., "LGBTQ Community", "Germany to the Germans", for stimuli, see Appendix in OSF). The groups and their names had to meet four criteria: (1) they had to appear as realistic Facebook groups; (2) they had to cover a broad range of ideological orientations and values so that (3) there would be at least one group to which each respondent could feel close and at least one group that they would reject; and (4) the groups should have no obvious connection to the issue under discussion (see below) to ensure sufficient between-subject variance in this variable, as we intended to measure the influence of perceived issue-related salience.

Participants were asked to select their favorite group (ingroup) and the one that least suited them (outgroup). Afterwards, several questions concerning personal media exposure and political characteristics were posed that will be reported elsewhere. These questions also served to distract respondents from the ingroup–outgroup selection in the beginning. In the next step, subjects were informed that their opinion on a new political topic was to be recorded. The issue, a fictitious but plausible political plan, was introduced as follows: "The retail sector in German cities is suffering from falling sales. One reason is the great success of Internet retailing. The German government is considering supporting local retailers. To this end, taxes for stationary retailers are to be decreased and increased for Internet retailers. This should make buying on the Internet more expensive and in stores cheaper." This topic was chosen as it ties in with existing debates in Germany, has a medium level of conflict between moral worldviews, and should generate solid interest among participants.

After measuring subjects' issue-related involvement, their issue-related uncertainty, they were shown a one-page screenshot with six fictitious issue-related Facebook posts that alternately spoke for and against the tax plan–depending on the version, there were four pro and two con posts or vice versa (Figure 2). Six posts were used to ensure within-feed variance for selective-attention indices while keeping total reading time compatible with typical panel respondents' behavior. The 4:2 ratio of pro/con posts provides a minimal majority manipulation that is empirically detectable but avoids artificial unanimity, preserving ecological validity and statistical sensitivity for interaction tests.

The content of the pro and con posts was kept constant (for stimuli, see Appendix in OSF). The post authors were different members of the Facebook group that each participant had previously chosen either as ingroup or outgroup. All author names were inconspicuous usernames. Each post consisted of a short personal text with one argument and a clear opinion (for or against the mentioned plan); the texts were between 247 and 289 characters long. To make the posts as realistic as possible, emojis were inserted (two per post) and Facebook-typical user reactions were added (type and number of reactions, number of comments, and shares). The user reactions differed only slightly, so that no aggregate social cues stood out. The number of six posts was chosen based on the assumption that

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most participants in an online access panel would not read all texts entirely, which encouraged selective exposure. On average, subjects viewed the newsfeed page for 54 seconds (median; *SD* = 41 seconds), which equals roughly two-thirds of the time needed to read all six posts.

The combination of individually chosen in- and outgroups and a stimulus containing Facebook statements by members of those groups allowed us to test a 2x2 design (Figure 2): Factor 1 was the *in-/outgroup opinion* concerning the proposed lower taxes for local retailers: Ingroup voices were either collectively in favor of or opposed to the proposed plan, and outgroup voices collectively held the opposite position. Factor 2 varied the *majority opinion*: Most voices were either pro (four pro versus two con voices) or con (four con versus two pro voices). The design included a pro and con version for each of the four combinations of the two factors, which in turn enabled us to determine the persuasiveness of approving versus disapproving posts, especially when the ingroup was in the majority versus the minority.

No treatment check was conducted regarding the *perceived* portion of in-/outgroup or pro/con posts in the feed. We assume that in social media use as a low-involvement situation, majority distributions can be effective even if recipients are not consciously aware of them.

Figure 2. Experimental design

		F1: Ingroup opinion (outgroup opinion opposite)	
		pro	**con**
F2: Majority opinion (minority opinion opposite)		(n = 53)	(n = 55)
	pro	Feed of 6 posts in this order: 1. Ingroup pro 2. Outgroup con 3. Ingroup pro 4. Ingroup pro 5. Outgroup con 6. Ingroup pro ➔ Ingroup pro in majority – outgroup con in minority	Feed of 6 posts in this order: 1. Outgroup pro 2. Ingroup con 3. Outgroup pro 4. Outgroup pro 5. Ingroup con 6. Outgroup pro ➔ Ingroup con in minority – outgroup pro in majority
		(n = 49)	(n = 60)
	con	Feed of 6 posts in this order: 1. Outgroup con 2. Ingroup pro 3. Outgroup con 4. Outgroup con 5. Ingroup pro 6. Outgroup con ➔ Ingroup pro in minority – outgroup con in majority	Feed of 6 posts in this order: 1. Ingroup con 2. Outgroup pro 3. Ingroup con 4. Ingroup con 5. Outgroup pro 6. Ingroup con ➔ Ingroup con in majority – outgroup pro in minority

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6.3 Measurement

The dependent and moderating variables were measured as follows (for English translations of scales, see Appendix in OSF).

To register subjects' *selective attention* to posts, a classical copy-test procedure (Sar & Rodriguez, 2017) was applied: Subjects were shown all post texts again at the end of the questionnaire and asked for each to indicate whether they had read it entirely (2), partially (1), or not at all (0). These ratings were condensed to mean indices for ingroup and outgroup posts (see Results).

The *credibility* of posts by the self-selected Facebook groups was measured using typical subdimensions of source credibility, as discussed in the literature on online and media credibility (e.g., Appelman & Sundar, 2016; Fawzi et al., 2021). The 5-point Likert scales consisted of five items each (trustworthy, competent, convincing, interesting, and relevant) and were condensed into mean indices, which were highly reliable (Cronbach's $\alpha = .92$ for ingroup credibility; $\alpha = .94$ for outgroup credibility).

Persuasion was measured as subjects' post-exposure opinion by asking: "What is your opinion? What do you think about giving local retailers a better tax position than online retailers?", using an answer scale from 1 = "I am clearly against it" to 5 = "I am clearly for it." This yielded an almost perfectly balanced distribution of opinions ($M = 3.07$; $SD = 1.25$).

Concerning controls and moderators, several user traits (media-related and political variables) and issue-related user characteristics were measured. In this paper, the following moderators are analyzed:

Issue involvement was assessed with a single-item scale from 1 = "Issue is completely unimportant" to 7 = "Issue is extremely important." $M = 4.90$ ($SD = 1.30$) indicated that most respondents found the political issue quite relevant. Due to the right-skewed distribution, we reduced the variable to two groups: Lower (points 1–4; 34.6% of subjects) and higher involvement (5–7; 65.4%).

Issue-related uncertainty was measured with one question: "Do you know enough about the subject to form an opinion?" with response options "I know enough" (25.3%) and "A little more info would be helpful" (74.7%).

To assess the perceived *issue-related salience of the in- and outgroup*, respondents were asked whether they thought the selected in- and outgroup (1) "actually has nothing to do with the issue," (2) "has little to do with the issue," or (3) "has a lot to do with the issue." As the mean values for all Facebook groups indicated weak to moderate salience, the variables were recoded into dummies (0 = no salience and 1 = medium or high salience). The average salience of all in-/outgroups can be found in the Appendix in OSF.

6.4 Sampling

Sample size planning was conducted using G*Power before data collection. According to the current state of research, small to medium effects were to be expected. Hence, the analysis aimed to detect small to medium effects ($f = .20$) in an incomplete between-subjects design with initially ten groups and three covariates (see H5 and RQ2), using ANCOVA with an $\alpha = .05$ and power $(1 - \beta) = .95$. The minimum requi-

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red sample size was $N = 434$. Sampling was done by a professional online access panel (Respondi) and intended to provide a representative sample of Germans aged 18–70 who use Facebook at least occasionally. The online survey was administered in summer 2022. Valid interviews had to meet two requirements: First, a completed questionnaire with a total completion time of at least four minutes (median completion time was 8:20); second, respondents had to pass an explicit attention check ("Check the box on the far left indicating complete disagreement"). This resulted in a final net sample of $N = 454$ subjects. For this publication, a sub-sample of 2x2 groups was analyzed, consisting of $n = 197$ participants (for final datafile and syntax, see Appendix in OSF). This sub-sample still ensures sufficient power for detecting small to medium effects. It is roughly representative of the German online population in terms of age ($M = 42.6$, $SD = 13.5$), sex (46.7% female, 53.3% male, no others), and education (51.3% with lower versus 48.7% with higher education, equaling the German Abitur). Group sizes vary slightly due to data cleaning and are listed in Figure 2. All four groups are statistically equal in terms of sex ($p > .98$) and education ($p > .61$, both chi-square tests) and slightly differed in age ($p = .07$, ANOVA).

7. Results

7.1 Main effects

> *RQ1 asked whether social media users pay more selective attention to ingroup posts than outgroup posts. Table 1 shows a within-subject comparison indicating that participants gave equal attention to both groups. This result was additionally tested using a general linear model of repeated measures controlling for age, sex, and education, which also found no effect.*

As already mentioned, subjects spent a relatively long time on the newsfeed page ($M = 54$ seconds). This corresponds to a usage situation in which individuals are confronted with a new political issue in their feed and aim to form an opinion. On the other hand, it contrasts with the typical social media situation, where users scroll quickly and inattentively. Therefore, the analysis was repeated with a subsample of participants who viewed the feed for no more than 20 seconds ($n = 32$). Again, no differences were found between the selective attention to in- versus outgroup posts.

Two explanations – or a combination of both – seem plausible. First, when confronted with the task of forming an opinion about an unfamiliar issue, users may attempt to review all positions and arguments, regardless of whether they come from ingroup or outgroup voices. Second, users might strongly rely on the algorithm's personalization (based on their prior selection) and thus pay equal attention to all posts presented. The fact that there was also no difference among the subsample of "quick skimmers" supports the second explanation: Low-involved users do not invest cognitive effort in selecting particular posts but scan the entire feed without discrimination.

H1 predicted higher perceived *credibility* of ingroup posts compared to those from outgroup voice. As hypothesized, subjects rated the credibility of *ingroup* posts rather positively ($M = 3.32$, above scale center), while the credibility of *outgroup* posts was

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rated negatively (M = 2.53, below scale mean). This difference was highly significant and confirms H1.

To check for main and interaction effects of the ideological names of the selected in-/outgroups (e.g., "Speed limit? No, thank you."), additional repeated measures ANCOVAs were conducted for both attention and credibility that confirmed the just reported results: There are no differences concerning the selective attention to ingroup and outgroup posts regardless of the specific names of the two groups (RQ 1). Ingroup voices are more credible than outgroup voices regardless of the selected group names (H1).

Table 1. In-/outgroup main effects on selective attention and credibility

Group	Ingroup posts	Outgroup posts	
Selective attention	M = 1.38 (SD = .62)	M = 1.39 (SD = .59)	t = .22
Credibility	M = 3.32 (SD = .94)	M = 2.53 (SD = 1.02)	t = 8.36***

Notes. n = 197; paired samples t-tests; *** p < .001. Attention: mean of all presented in-/outgroup posts on a scale from 0 to 2 (0 = "not seen", 1 = "partially read", 2 = "completely read"); credibility from 1 = low to 5 = high.

Examining H2 requires a between-subjects analysis. The prediction was that the ingroup's opinion would be more persuasive than the outgroup's opinion. Since all ingroup posts expressed the same opinion (either pro or con) and all outgroup posts held the opposite opinion, we compared participants who saw confirming ingroup posts (ingroup opinion pro) with those who saw confirming outgroup posts (outgroup opinion pro). A preliminary comparison of post-exposure opinions shows no significant differences between these two groups (see Table 2). At most, there was a slight tendency to adopt the ingroup opinion. H3 referred to the persuasive impact of the majority opinion in the newsfeed. As shown in Table 2, this effect was also weak and non-significant. Thus, both assumptions – that persuasive effects are driven unconditionally either by ingroup sources or by the numerical majority in a social media feed – must be rejected, at least in the present experimental setting.

Table 2. Main effects on persuasion

Group	**Ingroup** (Ingroup opinion pro – outgroup opinion con) (n = 103)	**Outgroup** (Outgroup opinion pro – ingroup opinion con) (n = 94)	
Persuasion	M = 3.13 (SD = 1.28)	M = 3.01 (SD = 1.23)	t = .66
Group	**Majority** (Majority opinion pro – minority opinion con) (n = 105)	**Minority** (Minority opinion pro – majority opinion con) (n = 92)	
Persuasion	M = 3.15 (SD = 1.25)	M = 2.97 (SD = 1.24)	t = 1.04

Notes. Independent samples t-tests; n.s. Persuasion from 1 = "I am clearly against it" to 5 = "I am clearly for it".

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7.2 Interaction and moderation effects

This leads us to the hypothesized interaction and moderation effects. H4 posits that ingroup voices are more persuasive when they are in the majority – and less so when in the minority. We further argued that this interaction effect may be moderated by specific conditions: Low involvement and high issue-related uncertainty (H5) and possibly by a perceived issue-related salience of in- and outgroups (RQ2). To test these effects, multiple regression models were calculated (see Table 3) including predictors of opinion distribution (ingroup/outgroup, majority/minority, and their interaction), issue involvement and uncertainty (main and interactive effects), and issue-related salience of in-/outgroups (main and interactive effects). In all models, sociodemographic controls (age, gender, education) were included.

Model 1 tests the main and interaction effects of ingroup and majority controlling sociodemographics. While the model ($R^2 = .045$, $p < .05$) and the main majority effect ($\beta = .461$, $p < .05$) are significant, the ingroup effect, the interaction and sociodemographics are not. This suggests that the hypothesized interaction effect (H4) occurs at best to a limited extent under general conditions and cannot be explained by age, gender, and educational backgrounds.

In Model 2, issue involvement and issue-related uncertainty were added. This increased both ingroup and majority effects and improved model fit ($R^2 = .086$, $p < .01$): When the pro position was articulated by ingroup voices, participants were significantly more likely to agree ($\beta = .717$; $p < .01$). The same applied to majority opinion: When the majority of posts supported the tax proposal, agreement increased ($\beta = .543$; $p < .05$). A significant interaction between both effects ($\beta = –.608$; $p < .05$) will be discussed below. Higher issue involvement increased approval ($\beta = .667$; $p < .05$) and moderated the ingroup effect ($\beta = –.542$; $p < .05$). We will return to this result below. In contrast, the majority effect appears unaffected by involvement ($\beta = –.027$; n.s.). Finally, issue-related uncertainty showed a small, non-significant effect ($\beta = .229$, n.s.). The data do not allow us to determine whether the effect is absent or whether the experimental setup failed to induce realistic uncertainty.

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Table 3. Regression models for persuasion

	Model 1	Model 2	Model 3
	β	β	β
Distribution of opinions in feed			
F1: Ingroup opinion (0 = con, 1 = pro) – outgroup opinion opposite	.446+	.717**	.394
F2: Majority opinion (0 = con, 1 = pro) – minority opinion opposite	.461*	.543*	.500*
F1 x F2	–.554+	–.608*	–.584+
Issue involvement & uncertainty			
Issue involvement (0 = lower, 1 = higher)		.667*	
F1 x issue involvement		–.542*	
F2 x issue involvement		–.027	
Issue uncertainty (0 = lower, 1 = higher)		.229	
F1 x issue uncertainty		–.022	
F2 x issue uncertainty		–.106	
Issue-related salience of in–/outgroup			
Issue salience of ingroup (0 = no, 1 = medium/high)			–.317*
F1 x issue salience of ingroup			.125+
F2 x issue salience of ingroup			.228
Issue salience of outgroup (0 = no, 1 = medium/high)			.302
F1 x issue salience of outgroup			.121
F2 x issue salience of outgroup			–.327
Controls			
Age	.024	.063	.016
Gender (0 = female, 1 = male)	–.138+	–.087	–.118
Education (0 = lower, 1 = higher)	–.138+	–.134+	–.130+
Model	**R^2corr. = .045***	**R^2corr. = .086****	**R^2corr. = .044+**

Notes. n = 197. Multiple regressions, ** $p < .01$, * $p < .05$, + $p < .10$

7. 3 Directions of interaction and moderation effects

A closer look at the significant interaction effects brings more clarity. As shown in Figure 3, ingroup voices strongly influence opinion when in the majority, but have little effect when in the minority. This suggests that both cues – the numerical majority and ingroup affiliation – are noticed and processed. When the ingroup is in the majority, recipients seem more open to processing and persuasion (left co-

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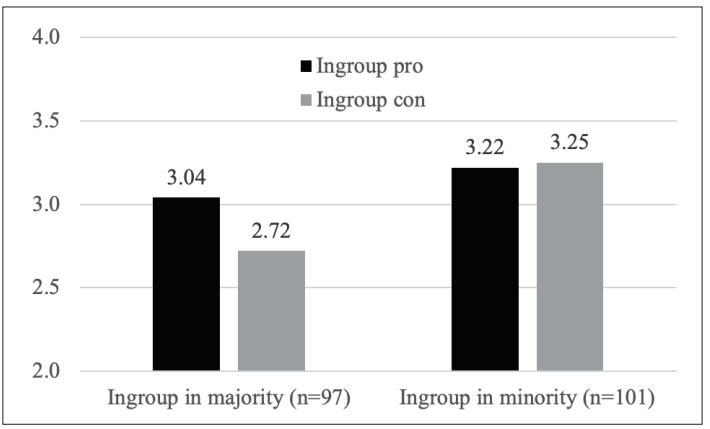
lumns: M = 3.04 vs. M = 2.72). In contrast, when the ingroup is in the minority and the outgroup dominates, users still read all posts (see above) but may experience reactance due to perceived hostility – resulting in no influence (right columns: M = 3.22 vs. M = 3.25). There is no evidence of a backfire effect, where dominant outgroup posts strengthen opposing opinions. Note that in the given setting, all posts contained valid arguments. If the outgroup were both dominant and posted invalid or emotional content – as often seen on social media – reactance or backfire effects would likely be stronger. In sum, the hypothesized ingroup effect occurs only when ingroup posts constitute a numerical majority (H4).

Figure 3. Ingroup versus majority effects on persuasion



Note. Opinion from 1 = "strongly con" to 5 = "strongly pro".

Figure 4 illustrates the interactions between issue involvement and both ingroup and majority effects. Regarding the ingroup effect (Figure 4a), participants with lower issue involvement adopted the ingroup opinion (M = 3.16 versus M = 2.49), whereas highly involved participants were not influenced by the ingroup (M = 3.11 versus M = 3.30). This effect was significant overall (Table 3: β = –.542, p < .05) regardless of whether the ingroup was in the majority or minority. Thus, a clear ingroup effect is evident under low-involvement conditions, but it disappears among highly involved users. In contrast, the majority effect appears independent of involvement (Table 3: β = –.027, n.s.): Both highly and less involved participants showed slightly greater agreement when the majority of posts supported the tax proposal (Figure 4b). The only difference was that greater involvement correlated with generally stronger agreement (Table 3: β = .667, p < .05). This is consistent with previous research (e.g., Johnson & Eagly, 1989) but not directly relevant in this context.

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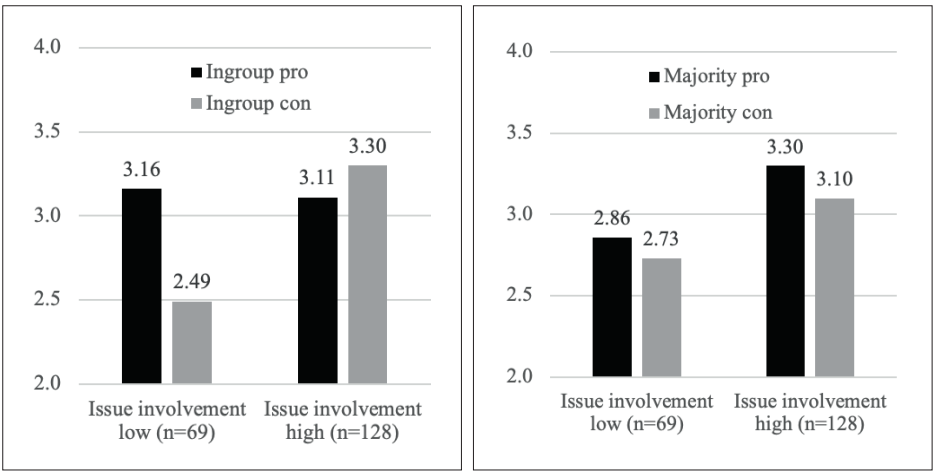
Figure 4. Ingroup versus majority effects on persuasion by issue involvement
(a) Ingroup/outgroup opinion (b) Majority/minority opinion



Thus, consistent with H4a, lower involvement increases the likelihood of an ingroup effect during opinion formation in social media, while the persuasive impact of majority opinion occurs independently of involvement. With respect to uncertainty, no differences in persuasion by ingroup or majority voices were found between individuals with high or low information needs (H5b rejected).

Finally, RQ2 examined whether the persuasive effect is moderated by the perceived issue-related salience of both ingroup and outgroup. As shown in Table 3, Model 3, *out*group's salience had no significant effect. In contrast, *in*group salience significantly decreased support for the tax change, regardless of the ingroup's stance ($\beta = -.317$, $p < .05$). This surprising result may be explained by the fact that the two groups most strongly associated with issue salience ("Germany to Germans" and "Free Democrats | FDP"; for stimuli, see Appendix in OSF) can be both considered market-liberal[1] and generally oppose tax increases. Thus, participants who chose one of these as their ingroup were more likely to reject the proposed tax. However, this is a *direct* effect, while RQ2 asked whether salience moderates in-/outgroup effects – which the data do not support.

The absence of moderation suggests that users are influenced by group opinions – even when the groups are largely unrelated to the issue. For example, someone aligned with vaccine opponents might adopt that group's stance on an unrelated topic. Similarly, users may reject outgroup opinions even when the issue lies outside that group's domain. This resembles the phenomena of affective polarization and ideological sorting. These concepts suggest that individuals emotionally reject opposing camps (affective polarization), develop consistent intra-camp opinions, and sort themselves ideologically across topics (e.g., Phillips, 2022).

1 The claim "Germany to the Germans" refers to racist and extremely right movements in Germany. The AfD is the only explicitly racist party in the German parliament and decisively pursues market-liberal policies.

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8. Conclusion

8.1 Key findings

This study explored how social media users form political opinions in response to ingroup and outgroup cues as well as majority signals in social media feeds. Drawing on theories of heuristic information processing, social impact, and social identity, we tested whether voices from ideological ingroups exert more influence than those from outgroups and majority opinion in a feed shapes individual opinion formation. A 2x2 experimental design using a simulated Facebook feed, combined with selective and forced exposure elements, allowed us to test main, interaction and moderation effects.

The findings show that ingroup voices do not receive more selective attention than outgroup posts but are perceived as significantly more credible. The assumption that social cues in a social media feed can influence opinion formation as strongly as, or even more strongly than, majority opinions is supported under certain conditions – namely, when users exhibit low involvement and when the ingroup position dominates the opinion climate. Interestingly, low-involved users were significantly more susceptible to ingroup cues, while majority influence remained stable regardless of involvement. Contrary to expectations, neither issue-related uncertainty nor the perceived salience of the groups significantly moderated the effects.

8.2 Limitations

The study has several limitations. First, because we investigated opinion formation on an entirely unfamiliar topic – i.e., starting from scratch – we chose a fictitious political issue. While this ensured experimental control, it limits ecological validity. More importantly, it restricts the generalizability of the findings to this specific usage scenario. Caution is therefore advised when applying the results to other forms or stages of opinion formation.

Second, although we used a realistic mock-up, a Facebook feed consisting of six posts from users affiliated with just two groups on a single issue does not fully replicate a typical social media experience. Moreover, participants were aware they were taking part in an experiment. Both factors may have influenced their level of engagement and limited the natural flow of social media interaction.

Third, and arguably both the study's greatest strength and its main methodological limitation: Because participants selected their ingroup and outgroup at the beginning of the experiment, they may have been particularly sensitized to these categories during feed exposure. This may have resulted in a priming effect, potentially inflating perceived credibility and persuasive impact.

Fourth, our operationalization of issue-related uncertainty relied on a self-report measure that required participants to make an unusually conscious judgment. It was implemented as a binary variable, which may have lacked sensitivity. Additionally, asking participants whether they wished more information about the issue may have conceptually overlapped with the construct of involvement.

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Fifth, there was no treatment check regarding the *perceived* portion of in-/outgroup or pro/con posts in the feed. This decision was made deliberately, as prompting participants to consciously reflect on the opinion distribution would have disrupted the low-involvement usage situation the experiment aimed to simulate. Nevertheless, the absence of such a check reduces internal validity, as we cannot determine with certainty whether respondents consciously registered the numerical distribution of in-/outgroup and pro/con posts. At the same time, the observed effect patterns – particularly the selective interaction between majority and ingroup cues – suggest that the manipulation operated as intended.

Sixth, the study was not fully preregistered. While the experimental design, stimuli, and questionnaire were preregistered, several analytical decisions – particularly regarding model specifications and variable codings – were made during the research process. This reduces transparency and limits the confirmatory character of the findings.

Finally, while our sample was demographically balanced, it consisted of self-reported Facebook users in Germany. This limits the generalizability of our findings to other platforms, cultural contexts, and media systems.

8.3 Implications and outlook

The findings offer insights into how social identity and group cues shape political opinion formation in digital environments. In times of increasing ideological fragmentation, the tendency of individuals to follow the voices of their ingroup – especially when these voices are numerically dominant and even when they are unrelated to the issue at hand – poses challenges for democratic deliberation. Echo chambers may not only reinforce preexisting beliefs but also inhibit open-minded consideration of opposing views, particularly among low-involved citizens.

The absence of a backfire effect offers a cautiously optimistic perspective: Exposure to opposing views may not further polarize users, provided that the discourse remains grounded in arguments. However, the limited influence of outgroup voices – even when they offer valid arguments – raises concerns about the declining role of deliberation and reasoned exchange.

From a normative perspective, platform design and content curation play a crucial role. Algorithms that reinforce ingroup exposure and amplify majority opinion may undermine opinion pluralism. Conversely, designs that promote exposure to diverse, yet credible perspectives could help counteract group-based biases.

Moreover, our findings suggest that in algorithmically personalized environments, political cues such as ingroup affiliation and majority alignment may outweigh the informational quality of arguments – particularly for low-involved users. This contributes to a more nuanced understanding of how filter bubbles operate: Not merely as echo chambers of like-minded opinions but as structurally biased environments where social heuristics are prioritized over deliberative engagement.

Looking ahead, future research should examine how these effects unfold in multi-issue environments, whether users recognize their own biases, and how plat-

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form affordances (e.g., comment sections, algorithmic filtering) interact with social heuristics. Policymakers and platform designers alike should consider the subtle yet powerful role of group-based cues in shaping democratic discourse online.

Generative AI declaration

AI-assisted tools were used to refine the English language, review the argumentation, remove redundant passages, and optimize the sampling section.

Supplementary material

The supplementary material can be accessed here: https://osf.io/f6x3u/

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