Role of social media news consumption in cultivating opinion polarization

Labeeba Kothur and Vidushi Pandey
Department of Information Technology and Systems, Indian Institute of Management Kozhikode, Kozhikode, India

Abstract
Purpose – This paper aims to investigate the mechanisms through which social media news consumption across different platforms leads to opinion polarization in society. To this end, the authors draw from cultivation theory to examine whether social media news consumption imparts a mainstreaming or resonance effect. Media consumption imparts a mainstreaming effect if frequent users, regardless of their social identity, develop homogenous attitudes about issues, whereas resonance is at play if there is a differing cultivation effect on various social groups depending on their relatability of life experiences.
Design/methodology/approach – The authors conduct the study in the developing context of India, using a population survey dataset from 2019. Regression-based mediation and moderation analyses were carried out to test the hypotheses.
Findings – The findings reveal that resonance is the most prominent mechanism through which social media news consumption cultivates opinion polarization, contrary to the mainstreaming effect imparted by television. Further, WhatsApp use was found to strengthen the polarizing effect of overall social media news consumption, while YouTube use weakened the cultivation of polarization.
Research limitations/implications – The paper unearths how social media news consumption influences the opinion polarization of various social groups differently. The authors also find the differential effect of specific platform use. These findings have the potential to inform policymakers and developers about how to mitigate the detrimental effects of platform-based political persuasion.
Originality/value – This study offers significant contributions. First, the authors explain social media-induced polarization using the novel theoretical lens of cultivation. Second, the authors find that social media and television news consumption differ in their polarizing effects. Third, the authors find that while WhatsApp use amplifies the polarizing effect of social media news consumption, YouTube use weakens it.
Keywords Polarization, Social media, Cultivation theory, Mainstreaming, Resonance
Paper type Research paper

1. Introduction
Detrimental cases of social media-fueled polarization and rampant misinformation have marred the peace of modern society. Societal polarization has been on the rise in the past decades in most countries as reported by Varieties of Democracy (Coppedge et al., 2019) and Pew Research Center (Pew Research Center, 2014) for instance, Facebook’s role in manipulating the electorate in the United States of America (USA) presidential elections, the Brexit referendum and social media’s role in polarizing Israel–Palestine events (Yarchi et al., 2021) have received global research attention. Social media platform Twitter is found to have a significant role in fueling the decade-long political polarization and the vicious online propaganda amidst the ongoing war in Ukraine (Barnes, 2022). In India, mainstream media reports that the recent turmoil in the wake of the citizenship amendment act and the subsequent religious polarization was fueled by the rampant use of social media for...
spreading misinformed videos and online hate speeches (The Hindu, 2020; Sircar, 2020). To this end, social media-induced polarization (SMIP) is a pressing socio-technical issue, demanding adequate research attention (Qureshi et al., 2020).

In the past decade, researchers in the politics, communications and information systems (IS) disciplines have shown substantial interest in investigating the role of social media platforms in opinion polarization (Arora et al., 2022; Kubin and von Sikorski, 2021). Here, social media platforms refer to new media applications such as Facebook, Twitter, WhatsApp and YouTube, using which users can create, consume, share and discuss information through their social network. It differs from traditional media sources such as television, newspaper and radio. We review empirical studies in SMIP that particularly investigate the effect of social media exposure and consumption on opinion polarization of users (Refer to Table A1. Literature Review). Extant research claims that social media algorithms and homophilic network structure coupled with human tendency for selective consumption might induce opinion polarization. This stance has gathered strong empirical support (Kitchens et al., 2020; Koivula et al., 2019; Levy, 2021; Lu et al., 2020; Ohme, 2021), with only very few studies providing counter-evidence (Beam et al., 2018; Johnson et al., 2017). But this is not a new phenomenon. The changing media landscape has always been accused of causing polarization in society. For example, the increase in partisan news channels in broadcast television, with the passing of the telecommunication act in 1996, was found to increase political polarization in the USA (Hmielowski et al., 2016). With the increased selective exposure and low content regulations, social media news sources are more fragmented and partisan than these television sources (Min and Yun, 2018). Thus, there is a need to better understand the process through which opinion polarization happens in case of social media news consumption and, more importantly, how it differs from the media effect of traditional media sources, specifically television. While prior research reveals various theoretical mechanisms to understand social media’s polarizing effect, few examine the role of social media in the broader context of traditional media consumption (Refer to our literature review in Table A1. Literature Review).

Despite the common single-media perspective, media do not exist in a vacuum but rather are a component of more complicated communication patterns. Understanding the differing mechanisms through which traditional media and social media news consumption induce polarization, is particularly important for multiple reasons. First, social media platforms are slowly supplanting traditional media as a ubiquitous source of information and opinions. This information consumption would have a significant influence over and above traditional media consumption on polarization (Kubin and von Sikorski, 2021). Second, the characteristics of social media and traditional media platforms differ significantly in multiple ways, predominantly in terms of reciprocity, interactivity and content control (Min and Yun, 2018). Thus, we can expect social media’s mechanisms of influence to be significantly different. Third, while strict regulations are in place for controlling the quality of traditional media content, policymakers are still unsure how to regulate social media information quality. Understanding the mechanisms by which news consumption through different media influences opinions will help us propose effective regulatory measures. Finally, systematic reviews on SMIP claim that extant studies restrict themselves to readily available social media data to study online polarization, while ignoring the exposure effects of multiple media platforms (Arora et al., 2022). The select few that study and compare the effect of social media and television news consumption are relatively atheoretical in nature (Iannelli et al., 2021; Lee, 2016).

We draw from cultivation theory to understand how social media news consumption influences opinion polarization and how this may be different from cultivation through television news consumption (Gerbner et al., 1994). Here, social media news consumption refers to the extent to which individuals use social media platforms such as Facebook, WhatsApp, Twitter etc. to consume news. As per cultivation theory, we posit that the extent
of social media news consumption exposes users to distortions of social reality resulting in
the cultivation of awareness to mainstream political events and opinion polarization.
We expect that contrary to the mainstreaming effect of television, social media news
consumption would impart a resonance effect resulting in differences in polarization across
different social groups. This leads us to our first research question (RQ).

**RQ1.** What are the mechanisms through which social media news consumption
cultivates opinion polarization? How is it different from cultivation effects of
television news consumption?

We live in a world with expanding media repertoire, with individuals using multiple social
media platforms such as Facebook, YouTube, WhatsApp, Snapchat, etc. simultaneously and
to different extents (Matassi et al., 2022). This multi-platform use would result in interactions
and interdependencies among the platforms, which might affect their overall polarizing
effect. These platforms also differ significantly in terms of their network structure,
functionality and affordances (Bossetta, 2018). Hence, it is plausible that owing to their
unique and contrasting characteristics, while a certain platform may strengthen the overall
polarizing effect, the other might even nullify the effect. It would be interesting to understand
the interdependent and emergent effects of these platforms in polarization context. However,
extant research in SMIP examine the polarizing effect of social media by either considering
the cumulative impact (Koivula et al., 2019; Lee et al., 2018; Lu et al., 2020; Ohme, 2021) or
restricting to single platform studies (Beam et al., 2018; Hermann et al., 2020; Valenzuela et al.,
2021) (Refer to Table A1. Literature Review). There is insufficient attention paid to the role of
multi-platform use, the contrasting architectural differences and how it may aid or hinder the
overall polarizing effect. Recent IS research stresses on the need to expand from a single IS
paradigm to Multi IS understanding to capture some of the interdependencies while using
multiple IS platforms (Gerlach and Cenfetelli, 2022). Building on this, we propose to study the
interdependent effects of specific platform use on overall news consumption.

WhatsApp and YouTube are two prominent social media platforms gaining popularity
for news consumption and political participation. Compared to social media platforms such
as Facebook and Twitter, they are understudied in the context of polarization (Kubin and von
Sikorski, 2021; Tucker et al., 2018). While YouTube is equally popular in Western and Eastern
contexts, instant messaging applications like WhatsApp and WeChat are increasingly used
in political debate and mobilization in non-Western and collectivistic societies (Gil de Zúñiga
et al., 2021; Yarchi et al., 2021). Apart from that, WhatsApp and YouTube have contrasting
architecture and affordances. To this end, it would be interesting to understand their
contrasting platform characteristics and their effect on the overall cultivation effect of news
consumption. Thus, we examine,

**RQ2.** What is the contingent effect of WhatsApp Use and YouTube Use on the social
media cultivation of polarization?

2. Theoretical background

2.1 Cultivation theory

Cultivation theory, a well-known communication theory, is proposed by Gerbner to study the
impact of television on people’s perceptions and behavior. As per this theory, cultivation
refers to “the independent contributions television viewing makes to viewer conceptions of
social reality” (Gerbner et al., 1994, p. 23). In its traditional sense, the theory proposes that
viewing television and thus exposure to skewed perceptions of social reality results in the
perception of the natural world as being similar to the world on television (Gerbner et al.,
1994). Like television, social media can cultivate perceptions and attitudes because both are
based on a collective symbolic environment that delivers stories and value to large groups of people (Hermann et al., 2020; Morgan et al., 2015).

While the original theory is based on television, recent empirical studies and systematic reviews on cultivation theory have argued that social media can also cultivate perceptions of reality among people, thereby encouraging the application of this theory in the new media context. In 2021, Tang et al. surveyed Government Social Media (GSM) users on the WeChat platform to infer that consumption of GSM content cultivates perceptions of information security behaviors towards COVID scams (Tang et al., 2021). Similarly, Hermann and colleagues in 2020, finds that Facebook use cultivates perceptions and attitudes towards ethnic diversity (Hermann et al., 2020). Another study on the effects of micro blogging use finds that the consumption of tweets about specific brands can significantly cultivate consumer attitudes towards those brands (Wei et al., 2020). Based on the context of the great east Japan earthquake, Cheng and colleagues compare the cultivation effects of television and social media consumption on perceptions and attitudes towards post-disaster recovery (Cheng et al., 2016). Moreover, systematic reviews of cultivation research suggest that considering the changing media landscape, there is a need for more studies investigating and comparing the mechanisms of cultivation in social media contexts and, subsequently, extending the theory to fit the usage of new digital media (Morgan et al., 2015; Morgan and Shanahan, 2010; Potter, 2014).

Based on its effect on distinct social groups, there can be two mechanisms of cultivation, namely, mainstreaming and resonance. As per the traditional definition proposed by Gerbner and colleagues, mainstreaming happens when frequent viewers of television, who would otherwise be different in their social characteristics, develop a homogenous view of the world through the consumption of the same content over time. On the other hand, resonance refers to a differential polarizing effect on various user groups depending on the relatability of life experiences that these groups have with the content in focus (Gerbner et al., 1980). Shrum and Bischak, in 2001, updated this conceptualization to differentiate mainstreaming and resonance based on direct experiences. As per this definition, under the mainstream effect, those whose life experiences are more discrepant from the world of television are the most likely to be influenced by the television message. Whereas resonance is the prominent mechanism if those with more direct experience will be more affected by television viewing than those with less direct experience (Shrum and Bischak, 2001).

2.2 Research model

In extant literature, the cultivation effect is proposed to take place due to two different psychological processes (Hawkins and Pingree, 1981; Shrum, 2017). In the first case, extended media exposure and resulting consumption can influence immediate perceptions about a phenomenon in social reality to be in line with what is seen in the media. This is a more heuristic form of processing information based on an individual’s memory accessibility and would relate to the most frequently or recently viewed media content. This memory-based processing often leads to judgments in the form of overestimation of frequency and probability of occurrence (e.g. level of crime in society, incidents of injustice against minorities) (Hermann et al., 2020). These forms of judgments are also known as first-order beliefs in literature. Since awareness of events and their commitment to memory is a key prerequisite to such first-order judgments, we proposed “awareness cultivation” as an outcome of this first sub-process identified by cultivation theory. We propose that news consumption first cultivates awareness of socio-political events among the citizens which they often commit to memory leading to the first-order judgments.

The second psychological sub-process proposed in cultivation theory is where people form evaluative judgments such as attitudes and values (e.g. world is biased against
minorities, a particular race is responsible for all crimes) (Shrum et al., 2011) through extended consumption of media. These kinds of evaluative judgments are also known as second-order judgments and opinion polarization falls under this category. We have therefore proposed “opinion cultivation” as the outcome of this second sub-process to suit the context of this study. In second-order judgments the information encounter leads to a spontaneous formation or updating of evaluative attitudes (Shrum et al., 2011). Just like television, the influence of social media news consumption on second-order judgments will increase with the frequency of consumption, that is, the more people consume news on social media, the more their attitudes, values and beliefs resemble those that are espoused in the social media narratives. Such second-order formation of attitudes is an outcome of the persuasiveness of the social media content users are exposed to (Shrum et al., 2011). Several studies in literature have found evidence of both first-order and second-order effects, but in most cases, just one of the mechanisms was not sufficient to explain the entire cultivation effect (Hermann et al., 2020; Shrum, 2017). In some cases, second order effect has also been conceptualized as generalized beliefs inferred from first-order information (Potter, 1991) or attitudes in line with first-order perceptions of social reality (Hermann et al., 2020).

Drawing from these tenets of cultivation theory, we propose that social media news consumption can have an independent effect on opinion polarization through two cultivation routes (Figure 1). First, social media news consumption can directly lead to increased awareness of mainstream political events in the country (awareness cultivation: H1) leading to user’s judgments about frequency and prevalence of issues. Second, social media news consumption can also have a direct impact on attitudes such as opinion polarization (second-order effect: H2). Additionally, users’ judgments about frequency and prevalence of issues from the first-order effect can, in turn, indirectly influence second order judgment of opinion polarization (H3, H3a: mediating effect). We further focus on identifying the mechanism (mainstreaming vs resonance) through which social media cultivation affects different social groups. To accomplish this, “Group identity (minority)” of users has been incorporated in the model as a moderator to understand whether the cultivation effect is similar across all groups (mainstreaming) or does it vary across minority vs majority groups indicating resonance (H4). Further, we examine RQ2 by incorporating WhatsApp use and YouTube Use as moderators to check the interdependent influence of multi-platform use on opinion polarization (H5a, H5b).

2.3 Hypothesis development

We hypothesize that social media news consumption cultivates awareness; specifically, frequent consumption of social media news is related to higher awareness about mainstream
political events happening in the country. An individual’s social media diet typically comprises three kinds of news information; mainstream news content subscribed by the individual, news content popular in individuals’ social network and algorithmic content pushed by the platform based on the popularity of the news and past usage patterns. The homophilic network patterns and algorithms based on content popularity could overemphasize a country’s viral posts and hashtags. During periods of political tension such as elections, people’s social media feeds are likely to be overpopulated by polarizing mainstream issues (Lee, 2016; Yarchi et al., 2021). Moreover, the affordances of virality results in repeated exposure of the same events through multiple platforms. Hence, it can be assumed that on frequent news consumption through social media, major patterns of mainstream political news are quite likely to creep into an individual’s feed, even if they have not specifically subscribed to such news sources.

First-order cultivation effects are commonly explained by memory accessibility and the availability heuristic that implies that the overrepresentation of certain news events in social media enhances accessibility of these mainstream events in memory (Hermann et al., 2020). Frequent social media news consumption would result in these persuasive messages and events to be strongly registered in the user’s long term memory, thus leading to faster recall when questioned. Thus, it is plausible that users who frequently consume news through social media platforms would be more aware of the mainstream political events happening in the country. Although prior literature finds that the amount of social media consumption is positively related to political awareness and political knowledge of citizens (Ghani et al., 2020; Lee et al., 2022), they do not specifically measure the impact on awareness of mainstream events. Thus, we argue that,

H1. Social media news consumption is positively related to awareness of mainstream political events in a country.

Cultivation theory posits a direct effect of media consumption on people’s attitudes about issues (second-order effect). Past studies in the domain have also found that social media information consumption has the power to cultivate attitudes, specifically, attitudes towards ethnic minorities (Hermann et al., 2020), homosexuality (Calzo and Ward, 2009) and corruption (Charron and Amnoni, 2021). We argue that due to the unique architecture of social media platforms, a person’s social media news feed may not be an authentic representation of social reality but a one-sided polarizing medium overrepresented by opinions over accurate facts. Moreover, due to the differences in each user’s feed owing to their personalized consumption patterns, their sense of social reality also diverges. As a result, people who frequently consume social media content, such as news, will start perceiving reality as similar to these biased representations. Extant SMIP literature highlights certain platform characteristics which we argue is inherently the reason for the biased representation of reality. First, it is found that popular social media networks mimic the offline homophily and these homophilic interactions increase with frequent consumption (Yarchi et al., 2021). This increases individuals’ consumption of congenial news posts shared by their strong ties and could reduce consumption of diverse opinions. Coupled with individuals’ selective consumption behaviors, such biased representation of reality can significantly influence the individuals’ opinion about issues. Second, most social media platforms algorithmically curate their feed based on content popularity and personal preferences (Kitchens et al., 2020). This results in users consuming news that reinforces their existing opinions and making it extreme (Levy, 2021). Based on these arguments, we posit that users who frequently consume news through social media platforms would have more extreme opinions about issues than infrequent social media users.

H2. Social media news consumption is positively related to opinion polarization

As per existing cultivation research, a relationship between first and second-order cultivation can exist, that is, second-order attitudes can be informed from first-order judgments
We therefore hypothesize that social media news consumption can indirectly influence second order cultivation judgments via perceived awareness about mainstream political events. Attitudes such as opinion polarization are strong attitudes that could be built in a memory-based fashion based on perception of prevalence of events (first-order effect) as well as by the persuasion of the content (second-order effect). Hence, memory-based first-order effect, “awareness of mainstream political events” could be particularly predictive of opinion polarization. In this context, extant research also recognizes an association between political knowledge and opinion polarization, with most studies finding a positive relationship to polarization through motivated reasoning (Herne et al., 2019).

Awareness of political issues happening in society can be a first step towards a citizen’s opinion formation. Incidental exposure and subsequent knowledge has been established as a major trigger towards political polarization (Lee et al., 2022). Hence, we expect users’ awareness of mainstream political issues, which is a sub dimension of political knowledge, to also positively predict their opinions.

H3. Awareness of mainstream political events is positively related to opinion polarization

H3a. Awareness of mainstream political events mediates the relationship between social media news consumption and opinion polarization.

In H2, we posit that social media news consumption is positively related to opinion polarization regardless of demographic differences. The cultivation mechanisms of resonance and mainstreaming help us to study whether media cultivation may or may not differ between distinct demographic groups in society. We adapt Gerbner and colleagues’ conceptualization that mainstreaming occurs if all frequent social media users, regardless of their distinct social identity, experience similar levels of cultivation effect, i.e. there is no difference in polarization effect felt by social groups. Whereas, if a certain social group with experiences relatable to those shown on social media experience stronger cultivation effect, then social media imparts a resonance effect (Gerbner et al., 1980). Few studies have investigated the cultivation mechanisms of mainstreaming and resonance in social media consumption context (Cheng et al., 2016). However, understanding these mechanisms can help us devise appropriate regulation strategies within social media platforms.

We propose that social media news consumption would impart a resonance effect, i.e. the cultivation of polarization would differ among distinct racial or religious groups. As appropriate in the context of India, we investigate whether social media has a differing effect on religious minority and majority users. This difference can be understood at two levels: (1) differences in exposure and consumption to polarizing content and (2) differences in the resonance felt towards the polarizing news content. First, owing to the selective exposure and personalized algorithms, it is plausible that social media content that the majority groups are exposed to differs from content pushed to minority users. Fueled by the fear of oppression and expatriation, religious and racial minority in a country may become an easier target of extremist groups and channels on platforms like Facebook, YouTube and WhatsApp leading to more polarized and misinformed content being pushed towards them. It has been established that extremist channels and political parties target specific demographic groups’ sentiments through social media (Amit et al., 2021; Herndon, 2018). In the 2016 U.S. presidential election, algorithmic advertising was utilized to strategically target social media users of different racial groups with tailored and fabricated political information aimed to mobilize or suppress voting (Bossetta, 2018; Wang, 2022). For instance, the Guardian reports that Trump 2016 campaign targeted 3.5 million black Americans to deter them from voting (Sabbagh, 2020). A pew research survey in 2016, finds that blacks are more likely to see racial content on social media platforms compared to the majority whites (Pew Research Center, 2016).
We can expect similar patterns of differences in exposure and thus, consumption of extreme social media content in Indian context as well, specifically with increase in hate speeches and crimes against minorities reported in popular media.

Second, due to their direct and indirect oppressive life experiences, it is plausible that racial and religious minority users tend to believe and resonate more with polarized social media content than the majority users. Racial and religious minority citizens tend to have more direct life experiences of discrimination and would have been brought up hearing such stories compared to majority citizens (Pew Research Center, 2016). In the Indian context too, the media has over-emphasized hate speeches, hate crimes and oppressive government action against minorities (Jayanth, 2022). In support, the resonance hypothesis of cultivation theory posits that when the social media content resonates with the consumer’s life experiences, such users tend to feel a stronger cultivation effect from the media consumed (Shrum and Bischak, 2001).

Prior empirical studies also offer support for our argument (Cheng et al., 2016; Wang, 2022). A cultivation study comparing the positive effects of social media and television consumption on perceptions about disaster recovery finds that cultivation effect of social media differs between disaster affected and not affected groups (Cheng et al., 2016). Specifically, social media consumption had a stronger effect on the level of anxiety of people directly affected than those who were not. Another study on political digital divide in USA society finds that social media’s effect on political participation differs between racial groups (Wang, 2022). Therefore, we expect similar trends in the context of opinion polarization.

Based on these tenets, we propose that social media’s cultivation of polarization is different across social groups, as minority users consume and resonate more with polarized content on social media compared to majority users. Thus, resonance is the prominent mechanism of cultivation.

H4. The cultivation effect (relationship between social media news consumption and opinion polarization) would vary across subgroups of social media users, implying that resonance is the prominent mechanism of opinion polarization on social media. Specifically, the minority group will feel a stronger polarizing effect compared to majority group.

Nowadays, it is common for people to use multiple platforms for their information and social needs. Their news repertoire has expanded from traditional sources such as television and print media to include social networking platforms like Facebook, instant messaging apps like WhatsApp and content sharing applications like YouTube (Matassi et al., 2022). These platforms differ in terms of network structure, algorithmic bias and affordances leading to variation in user’s exposure, consumption and interaction with news. Hence, it is likely that the amount of usage of specific platforms by users in their media repertoire will influence the strength of cultivation effect of overall social media news consumption. Existing SMIP literature has compared online platform content on their patterns of polarization, but studies that examine the influence of specific platforms and their characteristics on overall social media news consumption are sparse (Arora et al., 2022). WhatsApp and YouTube are two important social media platforms adopted and used extensively but studied less compared to social networking sites such as Facebook and Twitter (Tucker et al., 2018). Against this backdrop, we examine the role of extent of usage of these two platforms on the cultivation effect of overall social media news consumption on opinion polarization.

WhatsApp is a mobile-based instant messaging platform used majorly for personal and closed group interactions. Nevertheless, WhatsApp groups, both private as well as public ones, act as digital public spheres avidly encouraging political discussions. The platform’s core purpose is interpersonal interaction over content consumption, creation or self-presentation. We would like to emphasize on two core characteristics of the WhatsApp platform. One, its affordances are highly discussion promoting, particularly personal and
fear-free discussions through multiple modes (call, video, audio etc.). It is also a closed network, least accessible to regulators and reporters, which could result in the spread of misinformation and propaganda. Second, the WhatsApp network reflects the offline patterns of socio-economic homophily. i.e. in general, a WhatsApp user’s frequent ties would be others with whom he/she shares some social characteristics, like religion, class, caste, or gender. This is further reflected as active memberships in groups sharing similar political and religious views.

The discussion-promoting atmosphere, clubbed with the strong homophily, gives WhatsApp a significant position in an individual’s media repertoire. We propose that these two characteristics will significantly influence users’ opinions on news consumed through other channels. On the one hand, it leads to biased consumption, i.e. frequent usage exposes users to congenial content and experiences from strong ties sharing similar social backgrounds. This amplifies the resonance effect of total news consumption from all channels (Mattke et al., 2020). On the other hand, strong homophily coupled with the discussion-promoting atmosphere may polarize discussions on the news from other channels such as Facebook or Twitter. Prior research finds that discussions, whether congenial or cross-cutting, can lead to polarization (Bail et al., 2018; Lee et al., 2014).

WhatsApp provides a safe public sphere for emotional discussions on issues and news posts incidentally exposed from other platforms. The fact that these discussions are with strong ties, such as family members or friends belonging to same social class or ideology makes it more resonating with an individual’s own beliefs and experiences, creating an echo chamber effect. Thus, WhatsApp use adds a layer of social authenticity to news exposed through other platforms. Thus, an individual using WhatsApp extensively, would feel an increased impact of news consumed from other social media sources. Hence, we propose that frequent users of WhatsApp would feel stronger polarizing effect of overall social media news consumption, compared to infrequent WhatsApp users.

**H5a.** WhatsApp use positively moderates the relationship between social media news consumption and opinion polarization.

YouTube is primarily a video sharing social media platform. With most mainstream news companies hosting their live channels on YouTube, the platform is a hotbed for political news creation and consumption. Compared to WhatsApp, major focus of YouTube is on creation and proactive consumption of videos over social interaction. Interaction is limited to comments on live videos and uploaded videos or shorts. There is no emphasis on groups compared to other platforms. YouTube network is based on unidirectional ties in form of subscriptions mostly based on themes of interest. For example, a gamer’s network would comprise of experts in the domain of games and digital technology. Thus, YouTube network substantially differs from WhatsApp network as it is not formed around strong ties based on social background or personal interaction, but around themes of interest. In terms of algorithmic curation, YouTube exposure is highly algorithmically curated based on interest, popularity of content and past consumption preferences (Brown et al., 2022). Prior research suggests that YouTube’s channel recommendation algorithm fosters the creation of homophilous communities in countries like United States of America and Germany around content themes, location and language (Kaiser and Rauchfleisch, 2020).

Although interaction within an interest-based network may not be as resonating as that of WhatsApp, YouTube’s presence in an individual’s media repertoire can significantly influence their information consumption patterns. YouTube’s personalization algorithms and interest-based homophily can create an algorithmic echo chamber, particularly limiting users’ exposure to content related to their past usage, preferences and ideologies (Kaiser and Rauchfleisch, 2020). For instance, a user who engages with news posts about a particular topic online may be exposed to videos on similar topic, the next time they open the YouTube
Application. Such algorithmic effect dominated by rich visual content on YouTube, when coupled with news consumed on other social media platforms, can increase the overall believability of news posts, thus amplifying the cultivation effect of social media as a whole. Hence, we posit,

\( H5b \). YouTube use positively moderates the relationship between social media news consumption and opinion polarization.

3. Research methodology

3.1 Context and dataset

The study is based in India, a South Asian developing country. The societal impact of social media is particularly relevant in the Indian context for multiple reasons. First, with the advent of web2.0, India has seen a consistent upward surge in social media diffusion in the past decade and these patterns may be different from that of developed countries, with platforms such as WhatsApp and YouTube gaining popularity (Sardesai, 2021). Second, political and religious polarization has risen in Indian society in the past few years (Coppedge et al., 2019). Finally, extant research on SMIP shows an over-representation of studies focused on developed countries like the USA and European countries (Kubin and von Sikorski, 2021; Tucker et al., 2018). Thus, this study can contribute by investigating whether the impact persists in collectivistic developing countries with very different socio-economic backgrounds.

We used secondary data from a national level survey conducted in April–May 2019 by Lokniti program at Center for the Study of Developing Societies (CSDS), India. The survey was conducted across 208 parliamentary constituencies within 26 states in India. Adequate methods of sampling were followed, with constituencies being sampled using probability proportionate to size method (adjusting the probability of choosing a particular constituency according to the size of its electorate) and respondents being sampled from the electoral rolls using systematic random sampling technique (Lokniti, 2019). The survey is well suited for our study, as it is the only national level survey in India that includes questions on citizens’ social media use, specific to different platforms. In addition, the survey included questions measuring the degree of respondents’ political participation and their opinions on various socio-political issues.

The sample of respondents was identified from the electoral rolls and trained investigators conducted interviews at the participants’ home using a standardized questionnaire. The interviews took about 40–50 min. The initial raw dataset comprised of responses from 11,619 people. After the exclusion of subjects who never used any of the social media platforms and those who had missing values on key variables, we got a sample of 4,753 subjects (41% females, 22.5% religious minorities) which was used for regression 1 (effect of social media news consumption on Awareness of mainstream political events). For regression 2 and 3 (effect of social media news consumption on opinion polarization for Issue-A and Issue-B, respectively), we excluded respondents who did not have an account on WhatsApp and YouTube platforms, resulting in a final sample size of 3,688 subjects (38.8% females, 22.2% religious minorities) (refer to Table A2. Descriptive statistics).

Although we theorize the role of social media news consumption in general, we test our hypotheses in the context of political news consumption. We conceptualize opinion polarization as the extent to which opinions on an issue are opposed (DiMaggio et al., 1996; Lee et al., 2014). It is common practice to measure respondents’ ideological polarization on specific issues (Kubin and von Sikorski, 2021). In the western countries, this has been done in the context of issues such as climate change (Newman et al., 2018), abortion (DiMaggio et al., 1996), immigration (Iannelli et al., 2021; Ohme, 2021) etc. In Indian context of 2019, major
socio-political issues revolved around religion and governments’ treatment of religious minorities, particularly with the government proposing religion-centric changes to Indian citizenship. Reflecting on this socio-political climate, the Lokniti survey collected citizens’ opinions on similar issues. Accordingly, we develop two issues on which opinion polarization would be measured. Issue-A taps into the role of religion within politics and Issue-B taps into government’s treatment of minority communities. Based on exploratory factor analysis of opinion responses from the Lokniti questionnaire, we develop scales for Issue-A and Issue-B. We tested our research model twice in context of each of these issues.

3.2 Measures
3.2.1 Social media news consumption. Our main independent construct, social media news consumption, refers to the extent to which individuals use social media platforms to consume news. In prior literature, general “social media news use” has been avidly studied and measured as the extent to which social media platforms help users to be exposed and stay informed about events in general (Gil de Zúñiga et al., 2012, 2022). But, as we particularly tap on consumption, we adapt the method followed by Ahmed and Madrid-Morales (2021) and Lee et al. (2021) who used a single item to measure “How often respondents used social media to get news”. We specifically test our hypotheses in the context of political news consumption and measure ‘how frequently respondents use social media to read news related to politics’ on a scale of 0 (never) to 3 (daily) (Mean (M): 1.13, standard deviation (SD): 1.14). Literature reports that such single-item measures may be adequate in situations such as this, where the question is specific and easily comprehensible to the subjects (Bergkvist, 2015; Hodson et al., 2013) (Refer to Table A2 for descriptive statistics, Table A3 for measurement items).

3.2.2 Awareness of mainstream political events. The “awareness of mainstream political events” construct taps on the respondent’s awareness of the popular political events in the mainstream media prior to the survey. Although related to general “political awareness” construct (knowledge about political events and issues), prior studies mostly measure political awareness as subjects’ factual knowledge about political issues (Bartle, 1997) over awareness of events. Nevertheless, an Indian study employs a different method by forming an index out of the subjects’ awareness about certain events and issues popular in the country (Attri, 2013). Following this method, we measure awareness, using survey questions that asked subjects whether they had heard about four popular issues circulating in the mainstream media during the past few months: 1, the controversy surrounding the Rafale aircraft deal 2, the slogan “chowkidar chor hai” 3, the slogan “main bhi chowkidar” 4, Indian military response to Pulwama attack. The awareness of mainstream political events index was formed from the sum of these four binary responses for each subject (M: 2.9, SD: 1.36, range: 0–4). So, if a respondent has heard about all four issues, the variable score is four and he/she can be considered highly aware of the mainstream political events.

3.2.3 Opinion polarization. This study measured opinion polarization on two issues, namely, role of religion within politics (Issue-A) and governments’ treatment of minorities (Issue-B). The measure for Issue-A comprises of two Likert scale items asking respondents’ agreement with politicians seeking support from religious leaders (Cronbach’s reliability (CR): 0.88) Opinions on Issue-B was measured using 3 items asking respondents’ agreement on whether the minorities should receive equal/special/protective treatment compared to majorities of the country (CR: 0.71). We use absolute values of responses to these questions to calculate opinion polarization as observed in prior literature (Lee et al., 2014; Lu et al., 2020; Stroud, 2010). Specifically, indexes formed out of the sum of the absolute values of responses, are used as polarization measures of both issues (Issue-A: M = 2.73, SD = 1.24, Range = 0–4; Issue-B: M = 4.21, SD = 1.54, Range = 0–6).
3.2.4 Moderating variable – minority. As per National Commission for Minorities Act, 1992, Muslims, Sikhs, Christians, Buddhists, Jain and Zoroastrians have been notified as minority communities in India. Hence, a dummy variable is used to identify these minority respondents (minorities = 1, others = 0).

3.2.5 Moderating variable – WhatsApp use and YouTube use. The respondents were asked how often they used each platform, with responses ranging from 0 = never to 5 = many times a day (WhatsApp (Mean: 3.23, SD: 2.13, range: 0–5), YouTube (Mean: 2.81, SD: 2.13, range: 0–5)).

3.2.6 Control variables. Following previous cultivation and polarization studies (Lee et al., 2014, 2018, 2022) we included various control variables to avoid the spurious impact of confounding factors, reverse causation and distill the independent impact of social media news consumption. Hence, we control for traditional media consumption, specifically television news consumption, newspaper use and radio news consumption (Likert scale measuring the frequency of consumption), offline political participation (sum of five Likert scale items measuring various political activities during elections) and party affiliation. Apart from them, we include various demographic variables consistent with previous polarization studies: age, gender (dummy coded as 1 = male), education level, income, region (dummy coded as 1 = Urban) and state (Refer to Table A2 for descriptive statistics).

3.3 Analysis
We conducted multiple regression analysis in order to test awareness cultivation hypothesized in H1 (regression 1-effect on awareness of mainstream political events). Further, we conduct two regressions to test all hypotheses for both Issue A (Regression 2) and Issue B (regression 3); specifically, opinion cultivation was hypothesized in H2 and the moderating effect of Minority, WhatsApp use and YouTube use hypothesized in H4, H5a and H5b, respectively. Before running the analysis, we checked for all the assumptions of ordinary least squares regression (OLS). The variance inflation factors (less than 10) showed no multicollinearity in the models. We conducted Shapiro–Wilk test and Breusch pagan test, which showed deviations of the residuals from normality ($p < 0.05$) for both models and from homoscedasticity ($p < 0.01$), respectively. Thus, robust and heteroscedasticity-consistent standard errors were applied for all the linear regression models using the Huber White estimator (Huber, 1967).

In order to test the mediation hypothesis H3a, we performed mediation analyses for both models (Issue-A and Issue-B) in SPSS PROCESS. To examine mediation, we analyzed the relationship between social media news consumption (independent variable) and awareness of mainstream political events (the mediator variable) (path a) and the relationship between the mediator and opinion polarization on both issues (Path b1, b2, in respective models), when the independent variable was controlled for. Further, model 5 of PROCESS by Hayes (2017) was applied for testing mediation. The primary requirement to establish mediation is a significant indirect effect, i.e. the 95% confidence interval of the results for the indirect effect should not include zero.

4. Results
The results in Table 1 shows that social media news consumption is positively related to the awareness of mainstream political events ($\beta = 0.118; p < 0.001$) and opinion polarization on Issue A ($\beta = 0.079; p < 0.05$) and Issue B ($\beta = 0.089, p < 0.05$). It provides significant and robust support for H1, H2 for both issues (A and B). We do not find a significant relationship between awareness of political events and opinion polarization for both issues (H3), suggesting that it might not act as a mediating mechanism (H3a). In the first moderator
analysis (H4), we find that the interaction effect of minority on the relationship between social media news consumption and opinion polarization is positive and significant for Issue-A ($\beta = 0.115, p < 0.05$) as well as for Issue-B ($\beta = 0.121, p < 0.05$). That is, religious minorities feel a stronger cultivation effect from social media news consumption on polarization than the majorities in India, implying a prominence of resonance mechanism. Further, we find partial support for H5(a) on Issue-B, with WhatsApp use positively moderating the relationship between social media news consumption and polarization ($\beta = 0.094, p < 0.05$). Specifically, frequent users of WhatsApp felt stronger cultivation effect of social media news consumption compared to infrequent WhatsApp users on Issue B. In contrast, YouTube use seems to significantly weaken the existing effect of social media news consumption on opinion polarization for Issue-B ($\beta = -0.129, p < 0.01$).

To further explore the nature of the moderating relationships in H4 and H5 (a, b), it was necessary to plot the moderating effects. As shown in Figure 2, there was a positive

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Awareness of mainstream political events (regression 1)</th>
<th>Opinion polarization: Issue-A: Role of religion within politics (regression 2)</th>
<th>Opinion polarization: Issue-B: Governments treatment of minorities (regression 3)</th>
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<tr>
<td>Television news consumption</td>
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<tr>
<td>Gender (Male)$^b$</td>
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<td>0.044*** 0.000</td>
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<td>0.103 0.089</td>
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<tr>
<td>State specific effects</td>
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<td>-0.009 0.000</td>
<td>-0.006* 0.019</td>
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<tr>
<td>Party affiliation$^c$</td>
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<th>Independent variables</th>
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<td>0.121* 0.036</td>
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<td>WhatsApp use</td>
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</tr>
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<td>-0.129** 0.002</td>
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<tr>
<td>$R^2$</td>
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<td>0.062</td>
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<td>N</td>
<td>4,753 3,603</td>
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</tr>
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</table>

Notes: The estimates are standardized regression coefficients
a. Heteroscedasticity-consistent standard error estimators
b. Dummy-coded (1: male, 0: female)
c. Dummy-coded (1: affiliated to the ruling party, 0: others)
d. Dummy-coded (1: Urban, 0: Rural)
e. Dummy-coded (1: Minorities; 0: others)
Source(s): Authors’ own work

Table 1. Multiple regression analysis predicting awareness of mainstream political events and opinion polarization on Issue-A and Issue-B
relationship between social media news consumption and opinion polarization for both minority and majority respondents. Although there was only a negligible difference in opinion polarization between minority and majority respondents when social media news consumption was low, there was a substantial difference in opinion polarization values between them when social media news consumption was high. The results show that the cultivation effect of social media is different between minorities and majorities. Specifically, there is a stronger positive effect on the level of polarization of minorities. Therefore, we argue that social media can exert a resonance effect on a person's opinion polarization. Taken together, the results from Table 1 and Figure 2 established support for H4.

Figures 3 and 4 shows the moderation effect of WhatsApp use and YouTube use on the relationship between social media news consumption and opinion polarization for Issue-A and Issue-B, respectively. Although the moderation effect is only significant for Issue-B, the graphs show a definite pattern that extent of WhatsApp use influences the cultivation effect (H5a). Only frequent WhatsApp users show a significant positive cultivation effect. But we do not have any evidence for positive moderating effect of YouTube use (H5b). On contrary, YouTube use leads to a negative moderating effect for Issue B (Figure 4). Taken together, the results from Table 1 and Figure 3 establish a partial support for positive moderating role of WhatsApp use in the case of Issue-B (H5a).

The mediation analysis corroborates the findings from the main regression analysis that awareness of mainstream events does not mediate the relationship between social media news consumption and opinion polarization for both Issues A and B. Specifically, the indirect
effects are as follows: Issue A (role of religion within politics): \( a \times b_1 = -0.001, 95\% \) confidence interval (CI) \([-0.0028, 0.0027]\), Issue B (government’s treatment of minorities): \( a \times b_2 = 0.0021, 95\% \) CI \([-0.009, 0.0064]\). In both cases, the CI for indirect effect includes zero. Both findings from the regression and the mediation analysis rejects Hypothesis 3a.

4.1 Robustness checks

In the main analysis, we find interaction effect of minority to be significant, inferring religious minorities to feel stronger cultivation effect compared to religious majority group (H4) thus, signifying a resonance mechanism for social media cultivation. To give more credibility to our finding, we report two additional robustness checks.

First, we conducted separate regressions for each group, minority and majority. The results in Table 2 showcases that social media news consumption is positively related to opinion polarization for both minority and majority groups. However, the cultivation effect is significantly stronger for the minority group than the majority group on both the issues. This shows that cultivation effect varies in strength across different social groups, with minorities facing a stronger cultivation effect compared to majority respondents. This provides additional evidence for resonance mechanism of social media platforms.

Second, to compare the cultivation mechanism of social media with television, we investigate the mechanism in the context of television consumption as well. Specifically, we added minority as a moderator to the relationship between television news consumption and opinion polarization. We do not find any significance for the contingent effect of minority on television news consumption for both issues (Issue-A: \( p = 0.728 \), Issue-B: \( p = 0.209 \)).

![Moderation effect of YouTube use on social media news consumption and opinion polarization on Issue-A and Issue-B](image)

Source(s): Author’s own work

<table>
<thead>
<tr>
<th>Main independent variable</th>
<th>Groups</th>
<th>( \beta )</th>
<th>Sig.a</th>
<th>( \beta )</th>
<th>Sig.a</th>
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<td>Social media news consumption</td>
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<td></td>
<td>Majority</td>
<td>0.136</td>
<td>0.000</td>
<td>0.1</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Note(s): The estimates are standardized regression coefficients a. Heteroscedasticity-consistent standard error estimators

Source(s): Authors’ own work

![Group regression results (robustness check 1)](image)
5. Discussion

It is theoretically motivating and empirically appealing to uncover the mechanisms through which social media news consumption relates to opinion polarization. A handful of studies in the past have delved into developing such an understanding. Extant literature reports that social media news use might lead to opinion polarization (Koivula et al., 2019; Lu et al., 2020; Ohme, 2021). However, our review raises three significant gaps in literature. First, few theoretically examine the mechanisms of social media polarization in the broader context of traditional media consumption. Second, only a handful of studies have explored the interdependencies between specific social media platforms in the context of polarization (Kitchens et al., 2020; Yarchi et al., 2021). Finally, there is an overemphasis on the Western context and few have investigated SMIP in developing contexts like India (Tucker et al., 2018).

We attempt to address these gaps by using the novel theoretical lens of cultivation in the context of social media and polarization. This study looked into the (1) cultivation effects of social media news consumption on Awareness and opinion polarization (2) differing effects of social media and television cultivation (3) moderating effect of WhatsApp use and YouTube use on the social media’s cultivation of opinions.

5.1 Cultivation effects of social media

We applied Gerbner’s Cultivation theory framework into the new media context and proposed that social media news consumption has the potential to cultivate awareness (first-order judgment) and opinions (second order judgments). Our empirical findings offer support for awareness cultivation and opinion cultivation effect of social media.

First, we find a positive relationship between social media news consumption and awareness of mainstream political events (H1). In prior literature, social media news use was found to positively influence general political awareness and knowledge (Attri, 2013; Lee et al., 2022). Our finding not only aligns with this, but adds that social media news consumption might raise awareness specifically about mainstream socio-political events of the country. This indirectly implies the growing influence of mainstream media channels in social media news consumption. During its inception, social media was prophesied to overpower mainstream media and forming a democratic public sphere, by amplifying the voices of all sections of society equally. But recent discussion points out that the political and economic order controlling mainstream media might have infiltrated into social media platforms as well (Fuchs, 2014). Thus, social media may just be amplifying the effect and reach of mainstream content, which is also evident from the findings of our study.

Second, we find significant positive relationship between social media news consumption and opinion polarization on both issues. Thus, we offer consistent support to the “social media induces polarization” argument popular in literature (Qureshi et al., 2020), within the developing country context as well. We also discredit the argument, that social media has no effect or a depolarizing effect proposed by a few studies (Beam et al., 2018; Valenzuela et al., 2021). This is one progressive step towards bringing consensus in the mixed evidence on social media polarization literature. Especially, few has investigated the relationship in the context of developing countries like India. Altogether, we ascertain that cultivation theory framework can be extended to be used in social media contexts and we encourage future researchers to explain other social media phenomenon’s like online activism, social media entrepreneurial intentions etc. using this theory (Morgan et al., 2015).
5.2 Comparing social media and television cultivation

Building on the lack of studies examining the social media polarization mechanisms in the broader context of traditional media, our RQ1 examines the mechanisms through which social media news consumption cultivates opinion polarization and how it may differ from cultivation effects of television news consumption. Our findings offer strong evidence that social media and traditional media differs in their polarizing mechanism on distinct social groups. Specifically, the cultivation effect varies across subgroups of social media users, implying that resonance is the prominent mechanism of opinion polarization on social media, whereas television news consumption has a homogeneous effect on opinion polarization across subgroups, implying a mainstreaming effect. We specifically examine the difference between religious minority versus majority group, which is relevant to Indian context. We find that the relationship between social media news consumption and opinion polarization is stronger for religious minorities compared to majority, whereas television consumption offers no such effect. This supports our theory that (1) owing to the selective exposure and political targeting, minority users might be exposed to polarizing and extreme news content (2) social media news resonates more with users (minorities) who have direct or indirect life experiences of the issue at hand. To this end, in countries like India, social media channels and groups may be misused to amplify polarization among minority and marginalized groups, creating unrest in the society.

As per our review of extant literature, only one study has theorized on the differing impact of television and social media on polarization. Min and Yun (2018) find that social media users would be more selective in consumption than television users, owing to the high reciprocity and content control offered by social media platforms. We add another difference to this budding literature that, social media’s polarizing affect would also differ across distinct social groups contrary to television’s effect. Thus, social media imparts a resonance effect, while television imparts a mainstreaming effect.

Our finding shows some consistency with prior literature on how social media impacts racial groups differently. Wang (2022), reports that the effect of social media news consumption on online political participation differs between racial minorities (Blacks) and majorities (Whites), which is consistent with our finding. But, in their study, social media news consumption had a stronger impact on online participation for racial majority (whites) compared to racial minority (Blacks), which is in contrast to our study. This may be because we investigate the effect on polarization and not on participation. In future, researchers should test the moderating effect of minorities in other geographies in the context of polarization too.

5.3 Role of WhatsApp and YouTube Use

Building on the gap that extant research hasn’t investigated the interdependent and emergent effects of multiple platforms in polarization context, we propose RQ2 to investigate the contingent effects of WhatsApp use and YouTube use on the relationship between social media news consumption and polarization. We find empirical support for moderating effects of WhatsApp use and YouTube use on the cultivation relationship. This partially confirms our view that within a media repertoire, the extent of specific platform use influences the polarizing impact of overall social media use (H5). But, while we find that WhatsApp use strengthened the cultivation effect of social media news consumption (H5a), YouTube use weakened the effect, contrary to our hypothesis (H5b). We infer that social homophily and personal level interactions predominant in WhatsApp is more resonating than interest-based homophily found in YouTube platform. This further emphasizes on the power of discussions among strong social ties in forming opinions and decision making. In collectivistic countries like India, it is already found that offline advice networks gathered around house verandas
and public spheres play a major role in forming opinions and decision making, for instance related to information and communication technology (ICT) use (Venkatesh et al., 2020). WhatsApp might play as an online version of such arrangements, with intimate personal interactions amplifying the cultivation effect.

Extant literature in SMIP has studied WhatsApp platform independently to find that WhatsApp use has a depolarizing effect. A content analysis of WhatsApp groups revealed that WhatsApp discussions tend to become less polarizing on political issues in Israel (Yarchi et al., 2021). Based on a Chilean survey, Valenzuela and colleagues find that WhatsApp use had no effect on users opinion extremity on 7 contentious issues (Valenzuela et al., 2021). However, our findings report that, although WhatsApp may not have a direct effect, but, when used in combination with other news consumption platforms, it may strengthen the overall polarizing effect. This could be because social media users might be engaging in resonating personal level discussions on WhatsApp, about the news posts they consume through other platforms. Thus, WhatsApp’s strong tie homophily coupled with discussion promoting features amplify the polarizing effect of the news consumed from other platforms.

Similarly, we can explicate our contrasting findings regarding the moderating effect of YouTube. YouTube content analysis studies reports that with increased usage YouTube segregates users to highly homophilous communities based on interest, topic and location (Kaiser and Rauchfleisch, 2020) and drives real users to mild echo chambers (Brown et al., 2022). Another study finds that YouTube content is more polarized than television content and may polarize viewers (García-Marín, 2021). While these studies give some idea about the content within YouTube, in reality people engage with multiple platforms simultaneously. And, our results suggest that while YouTube usage independently might have a positive direct effect on polarization, when YouTube is used simultaneously with other platforms, it does not strengthen the polarizing effects of overall news consumption, but might weaken the effect (for Issue B only). This may be explained based on the affordances offered by YouTube. One of the primary features of YouTube is the search function, which affords users to proactively search for video content on any topic. Users are not restricted to information that was shared with them by their network members as is the case of WhatsApp. Instead, users have the agency to seek additional information about any topic of their choice using search functionality. In a multi-platform environment, users incidentally exposed to news posts through other platforms could be utilizing YouTube for seeking more vivid and detailed information about these topics (Gerlach and Cenfetelli, 2022). This kind of complementary use of YouTube may result in exposing users to diverse views and fact checking the news posts consumed through other mediums. Thus, this complementary use of YouTube platform may explain its weakening role on overall cultivation effect.

To this end, we provide initial evidence that there exists interdependencies and emergent properties when multiple social media platforms are used together. Similar to the above two effects, polarization effects could get amplified when multiple platforms are used in combination for news consumption. This further highlights a significant proposition in IS research (Gerlach and Cenfetelli, 2022) that there is a need to transition from a single IS paradigm to multi IS paradigm when studying social phenomena’s such as online participation and polarization. Although our current research design does not specifically capture news consumption patterns across multi-platforms and its effects on polarization, this could be a direction for further exploration in future research.

5.4 Other implications
Apart from these three main contributions, our study offers additional insights. Our data does not offer support to the mediating effect of awareness cultivation on Opinion cultivation (H3a). We cannot support the cultivation theory perspective that first-order judgments might
predict second order attitudes. Specifically, awareness of mainstream political events does not predict Opinion polarization. It is not consistent with prior literature that suggested political knowledge would predict polarization (Herne et al., 2019). But we considered awareness of only mainstream political events. It may suggest that political awareness about certain major events may not be a pre-requisite for being polarized. This might also indicate that a citizen need not be a political enthusiast or even be aware of mainstream political events, in order to feel the polarizing effect of social media news, especially when social media news can vary in topics and genres.

Another point to note is that the role of WhatsApp and YouTube use was significant only for Issue-B, not for Issue-A. This draws attention towards the importance of issue salience for a particular context. Issue-A dealt with respondents’ opinions on politicians getting help from religious leaders. Compared to Issue-B, which deals with the controversial topic of minority vs majority, Issue-A was less salient during 2019 elections and may not be a popular discussion topic over platforms like WhatsApp and YouTube. Thus, issue salience and its capacity to drive polarization maybe a major moderator of cultivation. Future research should take this insight further to compare impact of social media news consumption on issues ranging from controversial (political issue) to unconventional (e.g. climate change) and test whether the relationship is contingent on the type and strength of issues.

Although not hypothesized, there were some interesting insights from the coefficients of control variables. As expected, television news consumption had significant positive cultivation effect. Educated, Rich, urban citizens favoring the non-ruling party, are found to be more polarized on socio-political issues in India. However, gender failed to predict opinion polarization, which is not in line with extant literature that found that women are more polarized than men (Ondercin and Lizotte, 2021). Even then, the direction of the coefficient in our study aligns with this proposition. Future studies can investigate the role of gender in SMIP in developing country context.

5.5 Theoretical implications
Our study offers three significant theoretical contributions in understanding the phenomenon of SMIP. First, we draw from the novel lens of cultivation theory to explain how social media news consumption will cultivate skewed awareness and biased opinions resulting in opinion polarization. We also find that it is the resonating mechanism of social media news that drives polarization. Thus, we also expand the usage of cultivation theory to explain a phenomenon in the new media context. Second, till date, few have compared the mechanism of polarization of social media and television (Kubin and von Sikorski, 2021). We find that social media and television differs in their mechanism of polarization. Specifically, the polarizing effect of social media news consumption differs across social groups, while televisions effect does not. This is novel addition to the literature proving that while, social media exerts a resonance effect, traditional media channels like television might exert a mainstreaming effect. Finally, we theorize about the role of specific platforms and their characteristics and interdependencies on the polarizing effect (Yarchi et al., 2021).

5.6 Social and practical implications
The study offers some critical social and practical implications. First, the findings of the study calls to policymakers for strengthening government regulations and self-regulatory platform policies on user created content and extremist social groups in social media platforms. Especially our results claim that social media can be misused to target minorities by pushing posts resonating with them. While formal news posts might have an effect, it is the resonating effect of social opinions that have a higher impact. This is particularly relevant
for instant messaging apps like WhatsApp which is found to have an amplified resonance effect on citizens. Regulating exposure to polarized and fake content through social media platforms is an immediate need to mitigate communal tensions and riots in a country like India where diverse cultures and ethnicities coexist. Second, the study calls to platform developers and designers on the detrimental effects of algorithmic bias and homophilic network patterns in inducing polarization. Although WhatsApp has implemented certain features to curb the spread of disinformation, their effectiveness should be evaluated and more such nudges need to be designed. Finally, the study spreads awareness to users and common citizens that frequent usage of social media platforms for news might be polarizing their opinions even without their knowledge. Users’ needs to be rational while consuming highly resonating posts, as they might be shared by bots or targeted to manipulate one’s opinions.

5.7 Limitations
The present study is not without limitations. First, we only test correlation between the variables and do not imply causation. Future research can focus on longitudinal studies or experimental studies to effectively ascertain social media news consumption as causing polarization. Second, we do not control for endogeneity and a probability for reverse causation from polarization to social media news consumption. Nevertheless, we have controlled for all plausible confounding factors to determine the presence of independent effect of social media news consumption and avoid reverse causation, if any. However future work can incorporate methods like instrumental variable analysis or direction dependence analysis to rectify this issue. Third, in order to conduct the study in developing context, we had to use a secondary dataset with limited items which may have constricted us in the measurement of certain constructs, specifically, the first-order judgments related to Awareness cultivation. In an ideal scenario, we would also have preferred to capture first-order beliefs by measuring participants assessment of frequency and prevalence of issues and assessed the impact of awareness on these kinds of judgments. However, this being a study based on secondary data, this was not possible and we could only measure awareness cultivation. Future studies are encouraged to capture and verify these first-order judgments as well.

References


Sircar, N. (2020), “Not all communal riots are local. social media is now making them national”, ThePrint, 4 March.


## Appendix

### Social media induced polarization

<table>
<thead>
<tr>
<th>Sl.No</th>
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<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lee et al. (2018)</td>
<td>Political engagement</td>
<td>No/No</td>
<td>Cumulative social media use</td>
<td>South Korea</td>
<td>Social media news use has no direct effect, but indirect effect through political engagement. Social media use may lead to network heterogeneity, whereas political discussions may lead to opinion polarization. Social media use and participation in polarized events, reciprocally influence each other.</td>
</tr>
<tr>
<td>2</td>
<td>Lee et al. (2014)</td>
<td>Network heterogeneity, political discussion</td>
<td>No/No</td>
<td>Cumulative social media use</td>
<td>US</td>
<td>Social media use may lead to network heterogeneity, whereas political discussions may lead to opinion polarization.</td>
</tr>
<tr>
<td>3</td>
<td>Chang and Park (2021)</td>
<td>nil</td>
<td>No/No</td>
<td>Cumulative social media use</td>
<td>South Korea</td>
<td>Social media use and participation in polarized events, reciprocally influence each other.</td>
</tr>
<tr>
<td>4</td>
<td>Koivula et al. (2019)</td>
<td>Social identification, homophily and information bias</td>
<td>No/No</td>
<td>Cumulative social media use</td>
<td>Finland</td>
<td>Social media use predicts involvement in identity bubbles. Social media use predicts involvement in identity bubbles.</td>
</tr>
<tr>
<td>5</td>
<td>Ohme (2021)</td>
<td>Social influence, algorithmic preselection</td>
<td>No/No</td>
<td>Cumulative social media use</td>
<td>Denmark</td>
<td>Algorithmic social media use leads to attitude reinforcement on immigration issues.</td>
</tr>
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</table>

*Table A1. Literature review (continued)*
<table>
<thead>
<tr>
<th>SL No</th>
<th>Study</th>
<th>Theoretical mechanism</th>
<th>Multi-platform effect studied? (Yes/No)</th>
<th>Traditional media and social media</th>
<th>Multiple social media platforms</th>
<th>Which platform(s)?</th>
<th>Context</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Beam et al. (2018, p. 2)</td>
<td>Selective exposure, reinforcing spirals model</td>
<td>No</td>
<td>No</td>
<td>Facebook</td>
<td>US</td>
<td></td>
<td>Facebook has a depolarizing effect; Facebook use lead to exposure to counter attitudinal information</td>
</tr>
<tr>
<td>8</td>
<td>Valenzuela et al. (2021)</td>
<td>nil</td>
<td>No</td>
<td>No</td>
<td>WhatsApp</td>
<td>Chile</td>
<td></td>
<td>No evidence that usage of WhatsApp was related to issue opinion extremity</td>
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<tr>
<td>9</td>
<td>Iannelli et al. (2021)</td>
<td>nil</td>
<td>Yes</td>
<td>No</td>
<td>Cumulative social media use</td>
<td>Italy</td>
<td></td>
<td>Both television use and social media news use is associated with opinion reinforcement</td>
</tr>
<tr>
<td>10</td>
<td>Lee (2016)</td>
<td>Effect of immediate political context</td>
<td>Yes</td>
<td>No</td>
<td>Cumulative social media use</td>
<td>Hong Kong</td>
<td></td>
<td>Both social media and traditional media has polarizing effect, in highly polarizing political contexts</td>
</tr>
<tr>
<td>11</td>
<td>Lee et al. (2021)</td>
<td>nil</td>
<td>No</td>
<td>Yes</td>
<td>Cumulative social media use, messaging app use</td>
<td>US, Japan</td>
<td></td>
<td>Social media news consumption positively related to affective polarization; messaging app use has a depolarizing effect</td>
</tr>
<tr>
<td>12</td>
<td>Kitchens et al. (2020)</td>
<td>Effect of platform characteristics (Homophily, Algorithmic filtering) on information diversity and slant</td>
<td>No</td>
<td>Yes</td>
<td>Facebook, Reddit, Twitter</td>
<td>US</td>
<td></td>
<td>Facebook news consumption has a polarizing effect; Reddit depolarizing and Twitter has no effect</td>
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</table>

Table A1. (continued)
<table>
<thead>
<tr>
<th>S.No</th>
<th>Study</th>
<th>Theoretical mechanism</th>
<th>Multi-platform effect studied? (Yes/No)</th>
<th>Traditional media and social media</th>
<th>Multiple social media platforms</th>
<th>Which platform/s?</th>
<th>Context</th>
<th>Findings</th>
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</thead>
<tbody>
<tr>
<td>13</td>
<td>Johnson et al. (2017)</td>
<td>nil</td>
<td>No</td>
<td>Yes</td>
<td>Cumulative social media use, Twitter news use</td>
<td>US</td>
<td>Both SNS news use and Twitter news use was negatively related to affective polarization than those who engage in television use. People who use KakaoTalk were more selective in consumption than those who use Facebook.</td>
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<tr>
<td>14</td>
<td>Min and Yun (2018)</td>
<td>Selective exposure</td>
<td>Yes</td>
<td>Yes</td>
<td>Cumulative Use, Facebook, KakaoTalk</td>
<td>South Korea</td>
<td>People who use social media become more selective in consumption than those who engage in television use. People who use KakaoTalk were more selective in consumption than those who use Facebook.</td>
<td></td>
</tr>
<tr>
<td>Variables</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>Min</td>
<td>Max</td>
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<td></td>
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<tr>
<td><strong>Dependent variables</strong></td>
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<td></td>
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<tr>
<td>Opinion polarization Index- Issue-A</td>
<td>3,603</td>
<td>2.73</td>
<td>1.24</td>
<td>0</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>Opinion polarization Index- Issue-B</td>
<td>3,661</td>
<td>4.21</td>
<td>1.54</td>
<td>0</td>
<td>6</td>
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<tr>
<td><strong>Independent variables</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness of mainstream political events</td>
<td>3,688</td>
<td>2.9</td>
<td>1.36</td>
<td>0</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>Social media news Consumption</td>
<td>3,688</td>
<td>1.13</td>
<td>1.14</td>
<td>0</td>
<td>3</td>
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<td></td>
<td></td>
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<tr>
<td>WhatsApp use</td>
<td>3,688</td>
<td>3.23</td>
<td>2.13</td>
<td>0</td>
<td>5</td>
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<td></td>
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<tr>
<td>YouTube use</td>
<td>3,688</td>
<td>2.81</td>
<td>2.13</td>
<td>0</td>
<td>5</td>
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<td></td>
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<tr>
<td>Minority</td>
<td>3,688</td>
<td>77.8% (majority)</td>
<td>22.2% (minority)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
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</tr>
<tr>
<td>Television news consumption</td>
<td>3,688</td>
<td>3.12</td>
<td>1.02</td>
<td>0</td>
<td>3</td>
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<tr>
<td>Newspaper use</td>
<td>3,688</td>
<td>2.52</td>
<td>1.21</td>
<td>0</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio news consumption</td>
<td>3,688</td>
<td>1.57</td>
<td>0.966</td>
<td>0</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offline political participation</td>
<td>3,688</td>
<td>0.8</td>
<td>1.37</td>
<td>0</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>3,688</td>
<td>37.2</td>
<td>13.3</td>
<td>18</td>
<td>98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>3,688</td>
<td>20.5% (Urban)</td>
<td>79.5% (Rural)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>3,688</td>
<td>61.2% (male)</td>
<td>38.8% (Female)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table A2. Descriptive statistics

**Note(s):** The table shows descriptive statistics of the sample of 3,688 respondents used for Regression 2 and 3

**Source(s):** Authors’ own work

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Construct</th>
<th>Items</th>
<th>Scale</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Social media news consumption</td>
<td>How frequently do you use social media to read news related to politics?</td>
<td>3 = daily, 2-sometimes, 1-rarely, 0-never</td>
<td>Ahmed and Madrid-Morales (2021), van Erkel and Van Aelst (2021), Lee et al. (2021)</td>
</tr>
<tr>
<td>2</td>
<td>Awareness of mainstream political events</td>
<td>Have you heard of the controversy surrounding the Rafale aircraft deal? Have you heard of the slogan “Chowkidar Chor hai”? Have you heard of the slogan “Main bhin Chowkidar”? Have you heard about India’s air strike on terrorist training camps in Pakistan in response to the Pulwama terrorist attack?</td>
<td>Heard = 1, not heard = 0</td>
<td>Attri (2013)</td>
</tr>
<tr>
<td>3</td>
<td>WhatsApp use</td>
<td>How often do you use WhatsApp?</td>
<td>5 = many times a day, 4 = once or twice a day, 3 = some days a week, 2 = some days a month, 1 = very rarely, 6 = 0</td>
<td>(continued)</td>
</tr>
</tbody>
</table>

Table A3. Measurement items
<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Construct</th>
<th>Items</th>
<th>Scale</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>YouTube Use</td>
<td>How often do you use YouTube?</td>
<td>5 = many times a day, 4 = once or twice a day, 3 = some days a week, 2 = some days a month, 1 = very rarely, 0 = 0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Opinions</td>
<td>Now I will read out few statements. Please tell me whether you agree or disagree with each one of them?</td>
<td>fully agree = 2, somewhat agree = 1, can't say = 0, somewhat disagree = -1, fully disagree = -2</td>
<td>Lee et al. (2014), Lu et al. (2020), Stroud (2010)</td>
</tr>
<tr>
<td></td>
<td>Issue-A. Religion in politics</td>
<td>1. Political parties asking religious leaders for support</td>
<td>fully agree = 2, somewhat agree = 1, can't say = 0, somewhat disagree = -1, fully disagree = -2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Religious leaders giving support to political parties at the time of elections</td>
<td>fully agree = 2, somewhat agree = 1, can't say = 0, somewhat disagree = -1, fully disagree = -3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Issue-B. Governments treatment of minorities</td>
<td>1. The government should treat minorities in the same way as it treats the majority</td>
<td>fully agree = 2, somewhat agree = 1, can't say = 0, somewhat disagree = -1, fully disagree = -4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. The government should give special treatment to minorities</td>
<td>fully agree = 2, somewhat agree = 1, can't say = 0, somewhat disagree = -1, fully disagree = -5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. The government must protect the interests of the minorities</td>
<td>fully agree = 2, somewhat agree = 1, can't say = 0, somewhat disagree = -1, fully disagree = -6</td>
<td></td>
</tr>
</tbody>
</table>

**Source(s):** Authors’ own creation based on the survey questionnaire (Lokniti, 2019)
### Table A4.
Results of robustness check 2 (Role of minority on the relationship between television news consumption and polarization)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>Sig.⁠¹</td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newspaper use</td>
<td>−0.046*</td>
<td>0.026</td>
</tr>
<tr>
<td>Radio news consumption</td>
<td>0.037</td>
<td>0.08</td>
</tr>
<tr>
<td>Offline political participation</td>
<td>−0.012</td>
<td>0.374</td>
</tr>
<tr>
<td>Age</td>
<td>0.002</td>
<td>0.267</td>
</tr>
<tr>
<td>Gender (Male)⁠²</td>
<td>0.004</td>
<td>0.92</td>
</tr>
<tr>
<td>Education</td>
<td>0.032**</td>
<td>0.011</td>
</tr>
<tr>
<td>Income</td>
<td>0.04***</td>
<td>0.000</td>
</tr>
<tr>
<td>Urban⁠³</td>
<td>0.17***</td>
<td>0.001</td>
</tr>
<tr>
<td>State specific effects</td>
<td>−0.01</td>
<td>0.000</td>
</tr>
<tr>
<td>Party affiliation⁠⁴</td>
<td>−0.065**</td>
<td>0.008</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television news consumption</td>
<td>0.023</td>
<td>0.418</td>
</tr>
<tr>
<td>Social media news consumption</td>
<td>0.152</td>
<td>0.000</td>
</tr>
<tr>
<td>Awareness of mainstream political events</td>
<td>0.004</td>
<td>0.813</td>
</tr>
<tr>
<td><strong>Moderator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minority⁠⁵</td>
<td>0.086</td>
<td>0.108</td>
</tr>
<tr>
<td>Interaction of minority with television news consumption</td>
<td>0.02</td>
<td>0.728</td>
</tr>
<tr>
<td>$R^2$</td>
<td>4.8</td>
<td>5.85</td>
</tr>
<tr>
<td>N</td>
<td>3,603</td>
<td>3,661</td>
</tr>
</tbody>
</table>

**Note(s):** The estimates are standardized regression coefficients

a. Heteroscedasticity-consistent standard error estimators
b. Dummy coded (1: male, 0: female)
c. Dummy coded (1: affiliated to the ruling party, 0: others)
d. Dummy coded (1: Urban, 0: Rural)
e. Dummy coded (1: Minorities; 0: others)

**Source(s):** Authors’ own work

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**Corresponding author**

Labeeba Kothur can be contacted at: labeebakothur100@gmail.com

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