

# (Re)Design to Mitigate Political Polarization

Reflecting Habermas' ideal communication space in the United States of America and Finland

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Social Media platforms are increasingly being used for political activities and communication, and research suggests that social media design and use is contributing to the polarization of the public sphere. This study draws on Habermas' ideals concerning deliberative democracy to explore if novel interface designs that diversify information sources through content recommendation, can decrease polarization. Through a design-probe interview approach and insights generated from 19 political and citizen experts in Finland and the United States, we found that our deliberative design can lead to depolarization, while creating additional complexity through which users question content and information. We discuss the need to move beyond naive content recommendation, and user interface level changes, in order to work towards a depolarized public sphere.

CCS Concepts: • **Human-centered computing** → **Collaborative and social computing**; **Empirical studies in collaborative and social computing**; *Interaction design process and methods*; • **Applied computing** → *Law, social and behavioral sciences*;

Additional Key Words and Phrases: political polarization; social media; Habermas; speculative design; comparative research

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## 1 INTRODUCTION

Social media platforms, such as Facebook and Twitter, invite the formation of ad-hoc digital public spheres through which people can come together to engage in political exchanges either through the sharing of information and opinions, or by engaging in discussion [17, 65, 96, 126]. However,

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research has highlighted that social media users tend to gravitate towards like-minded people, and information sources that re-enforce their own opinions [7, 45, 53, 102]. This endangers the quality of political discussions, as alternative perspectives critical in political decision-making processes are absent. The scholarly community has referred to the phenomena in a variety of ways: *selective exposure* [1, 79–81], *echo chambers* [62, 117], or *filter bubbles* [97]. These phenomena have been linked with political polarization, which can be characterized as the increased ideological distance between members of society [70].

Throughout Western democracies, political polarization is considered to be on the rise [26, 70, 122, 125], but the role of social media is unclear. Scholars have empirically argued that social media is driving polarization [1, 62, 79, 81, 97, 117], while others have found that platforms are leading towards depolarization [32, 36, 105]. More generally, research has shown the importance of studying polarization as it can contribute to social instability [70]. To mitigate these negative effects, the HCI research community has been involved in developing systems to decrease polarization, but these efforts have focused too narrowly on systems that aim to balance and diversify information and news [20, 41, 42, 85, 98]. Nelimarkka et al. [89] refer to this issue as the “Common Design Agenda,” and discuss the need to expand research, and develop alternative design solutions, in order to effectively work towards depolarization.

In this study, we developed and tested alternative interface designs inspired by Habermas’ [54] ideals of deliberative democracy, and through a design-probe inspired interview approach, we explore how design thinking can contribute to depolarization. Specifically, we investigate how 19 informants reacted to, and reflected on, our interface designs in order to understand how to (re)design interfaces to depolarize the online public sphere (RQ1). Furthermore, we seek to understand what elements may limit such efforts (RQ2) and examine indications of cross-national differences to explore how different socio-cultural factors must be accounted for when designing to mitigate polarization (RQ3). We conclude by discussing the implications of our findings for reducing political polarization and the challenges which relate to such designs.

## 2 LITERATURE REVIEW

### 2.1 Deliberative Democracy and the Public Sphere

Deliberative democracy, or political deliberation, is a process through which citizens participate in discourse around public issues [23, 31, 54, 58] and is utopian in nature [28] as it is rooted in democratic idealism that promotes civil discourse amongst citizens who are part of the greater public [23]. According to Habermas, deliberative democracy exists in the public sphere, a communication space that brings together people from different publics, whereby people can engage in the exchange of information and opinions, and discourse [23, 31, 54, 58]. For a public sphere to work, it should: (1) promote the *inclusion* of all people who are impacted by decision-making processes, (2) occur in a *civil* and *well-informed* manner to encourage rational argumentation and constructive dialogue, and (3) support *idea role taking* whereby people are encouraged to reflect on other perspectives than those held by oneself. We will further elaborate these concepts in Section 3.5.

Digital platforms, such as Facebook and Twitter, can be conceptualized as a type of online public sphere [9, 44]. That is, these platforms provide socio-technical mechanisms through which diverse actors from different publics can come together to engage in political deliberation. Recent scholarship has explored the emergence of social media as public spheres through explorations of political blogs [22, 51], political discussion forums [2, 63], and social networking sites [9, 104].

While social media platforms can be viewed as public spheres, scholars have explored the extent to which these online spaces actually adhere to Habermas’ [54] vision. Many concerns have been raised, including the lack of rational discussions [63], problems in acknowledging other users perspectives

[5, 9], or exclusive participation structures [2, 63]. Furthermore, an underlying argument against Habermas' work has been the *structural transformation* of public discussion from open spaces (like cafés) to closed spaces. Moreover, the role of digital platforms as business enterprises has been of concern to some scholars [23]. However, even with these criticisms, the concept of public sphere has been extensively used to study digital spaces (e.g., [2, 9, 22, 51, 63, 90, 104]), thus motivating us to use this framework as well.

## 2.2 Political Polarization and the Online Public Sphere

A primary issue identified in scholarship exploring the public sphere, both online and offline, relates to the concept of polarization. Political polarization refers to the increase of ideological distance between individuals or groups [70].

Political polarization has devastating societal impacts as the divergence of political attitudes and beliefs, towards politically opposing extremes, can lead to a lack of common ground [70]. This lack of common ground can create societal instability as people from opposing poles might work in opposition as opposed to working in service of the greater good. Polarization may decrease interest and trust in political decision-making processes [70, 127]. As such, social scientists have been concerned with the effects of political polarization on society and the political climate. Indeed, recent work in the United States has found that political polarization between political parties [70] and in the media [102] has increased. Findings among citizens have been more mixed [35, 70, 102]. An increase in political polarization has been echoed in European scholarship as well [26, 122, 125].

With respect to polarization and social media, users tend to gravitate towards people who are like them, and information sources that re-enforce their own opinions and perspectives [7]. Scholars have developed concepts to situate this phenomenon, such as selective exposure [1, 79–81], echo chambers [62, 117], and filter bubbles [97]. For example, in their study of political blogs, Adamic & Glance [1] reported that the majority of political blogs only link to other blogs that shared the same political ideology. Similarly, Gilbert et al. [46] found that blogs were echo chambers—that is, blog comments were most likely to agree with the ideology presented by the original blog post.

## 2.3 Political polarization and social media platforms

More recent research on social media's role in creating polarization have been mixed. Some suggest that social media *does not contribute* towards political polarization. Fletcher & Nielsen [36] show that due to incidental exposure, social media users use many more digital media sources than non-users. Messing & Westwood [80] noted in their study that social media could increase exposure to diverse political views and lastly, Dubois & Blank [32] show that the greater a users' interest in politics often manifests in diversity-seeking behavior and openness to changing one's political opinions. Thus, social media is not always to blame for polarization. Researchers even suggest that citizens engage in depolarizing practices, where people are actively seeking diverse information [114]. People do not filter information that contradicts their personal views [59]. Moreover, people have agency in constructing their social media environments to promote depolarization by choosing the social media sites, and in turn, controlling the diversity of the information sources and audiences they engage with [80, 105].

However, other scholars have argued that social media environments *create* a polarization effect. Itkonen et al. [60] show that Facebook users tend to construct their online social networks such that their friends share their perspectives and political backgrounds. Similarly, Barbera et al. [8] show that echo-chamber effects are present particularly in connection with political issues on Twitter. Pariser [97] argues how algorithms shape public interaction and thus contributing to the increase of political polarization and igniting both public and politicians' interest on this topic. As such, the socio-technical systems that people use for political deliberation can lead to biased

media consumption, which can manifest in a persons' reality becoming "distorted." However, many scholars argue that political polarization is (at least partly) fueled by biases within the computer-mediated communication environment.

To conclude, there is mixed evidence concerning whether or not social media is contributing to increased political polarization. According to some, social media creates richer, more diverse media environment and thus, should push against polarization in the society [32, 36, 80]. Conversely, others blame social media services and their design for creating limited media environments that, in turn, lead to polarization [97]. Furthermore, it is difficult to say if social media causes political polarization, what is the mechanism that drives it. It can be caused by the design of technical systems (such as algorithmic design, [97]) or by social processes (like befriending like-minded people, [7]).

## 2.4 Designing for Depolarization

It is still unclear whether social media contributes to political polarization, it nonetheless remains an important issue to explore and address. We know that socio-technical systems and digital interfaces can establish social norms [109], and it is our imperative as designers to think more deeply about the potential negative implications of the systems we design. For example, Matamoros-Fernandez [77] calls out that the design of platforms may partly contribute to online racism. As Winner [124] and Nissenbaum [92] have argued: technologies are never neutral. Therefore, it is important to think deeply about how we can re-design current social media platforms such that we can mitigate the harmful effects of polarization. Considering interfaces can enforce and re-configure social norms and practices, we must then deeply consider how we can re-design existing systems. Even if, as some argue [32, 36, 80], current designs are mitigating polarization, we should consider where and how we can expand upon such designs.

Today, HCI scholarship exploring how to mitigate the effects of polarization has focused on designing systems to promote diversity in information consumption [40, 85–87, 98]. Specifically, previous work has focused on developing systems to promote *diverse news reading* practices. For example, researchers have proposed systems where news content recommendations come from opposite sides of political spectrum [86, 87, 98]. Moreover, studies have suggested that the exposure to diversity should be taken as a design goal for recommendation systems [57]. Also, tools which raise self-reflection through quantifying how balanced ones' news reading habits have been proposed [85]. Self-reflection has also been integrated to help people engage with different political opinions [40]. Across these systems, the goal has been to promote behavioral change techniques to encourage the depolarization of news reading habits.

Similarly, scholars have explored how friendship recommendations may be used for depolarization. For example, social media services can recommend new friends in a way that diversifies users' friendship networks [41, 42, 80]. Their main argument is that this would increase the chances of meeting people from opposite perspectives and observe how their perspective is present in this discussions. This could, in turn, lead people to be exposed to diversity in information, opinions, and discourse. However, even such designs can lead to polarization [6].

This focus on developing recommendation or behavioral change systems with depolarization in mind has been labeled as the "Common Design Agenda" [89]. Nelimarkka et al. [89] studied a real world case which would be emerging from such systems and observed that it can lead to antisocial behavior and hostility towards the other group. Based on these findings, they concluded that more work is needed to fully realize how we can design for depolarization.

A critical challenge is developing features that enable citizens to participate freely, to engage with diverse audiences and consider alternative perspectives, and engage in political deliberation through well-informed and justified discourse. Due to Habermas' influential role in studies of digital

ID	Description	ID	Description
FI-P1	Team leader for editorials and letters to editors sections for a Finnish nationally distributed newspaper. Male, late 40s.	US-P1	Political reporter for an online-only politics specialized outlet. Female, mid-20s.
FI-P2	Product lead in charge of digital news reading application for a Finnish television broadcaster. Male, mid-30s.	US-P2	Research fellow in political science. Engages with politics mostly in-person, not with strangers. Male, late 20s.
FI-P3	Ministerial adviser working on the topic of media policy in Finland. Male, early 30s.	US-P3	Professor of political science. Uses Facebook and Twitter to follow political issues. Female, late 30s.
FI-P4	Social media consultant for a political party in Finland. Female, early 30s.	US-C1	HR representative. Uses Twitter and Facebook to engage in political discussion. Male, late 30s.
FI-P5	Ministerial advisor working on areas of democracy and participation. Male, early 40s.	US-C2	Works in childcare & teaches. Uses Facebook to engage in political information exchange. Female, mid-20s.
FI-C1	Entrepreneur and CEO of ICT related company. Actively blogs and engages to political discussions in Finnish non-partisan Facebook groups. Male, mid-30s.	US-C3	Teacher. Engages politics in Facebook. Male, mid-20s.
FI-C2	Retiree, actively blogs and has recently started to use Twitter to engage with politicians. Female. early 70s.	US-C4	Working in the IT industry; uses Facebook and Twitter to discuss politics with family and friends. Male, mid-20s.
FI-C3	Communications and strategy consultant and entrepreneur. Blogs and Tweets actively of politics. Male, early 50s.	US-C5	Working in the IT industry; uses Facebook and Twitter for political discussions. Female, early-20s.
FI-C4	Retiree and entrepreneur. Blogs actively of politics. Male, mid-60s.	US-C6	Student. Discusses politics with friends in Facebook. Female, mid-20s.
FI-C5	Student at a University of Technology. Uses Facebook groups, Discord etc. to engage into political discussions. Male, late 20s.		

Table 1. Interviewee backgrounds.

space (e.g., [2, 9, 22, 51, 63, 90, 104]), our design work follows principles of deliberative democracy to achieve the goal stated above. However, as we have observed already above, the framework is debated [e.g., 88]. For example, Dewey [28] is used to critique his conception of the public sphere as being highly utopian, while others have described his values as difficult to implement in online spaces [23]. In particular, Dewey [28], in “The Public and its Problems”, describes stark realities of civic life related to when, how, and who can participate in the democracy. Others have pointed out that the goal of rational discussion may not leave space for personal experiences and affects, critical in political decision-making as well [14]. While our work does not seek to expand the political philosophy of designing for depolarization, it is important to consider limitations of deliberative democracy as well.

### 3 RESEARCH METHOD

#### 3.1 Research context

This research employs a comparative design across two different nations: Finland and the United States. The nations studied have different levels of political polarization, which may lead to different user reactions and findings at the country-level, given research that suggests that social media has polarizing potential (see Section 2.3). Furthermore, the two countries demonstrate different media systems; in Finland the public broadcasting and non-partisan editorial media are prominent, while in the United States many media outlets demonstrate some degree of partisan bias [56]. With regard to political communication, findings have shown that social and digital media may have country level variations [36, 73, 120]. We seek to study how depolarization design choices may be different across context. Required depolarization efforts in a nation where there is high polarization and a partisan media environment may be different a nation where there is lower polarization and more access to public and non-partisan media. Therefore, comparative approach explores if interface design contains aspects that may inadvertently introduce even deeper polarization.

**3.1.1 Polarization in the United States.** American society can be described as one that is primed to be polarized. Firstly, it has a two-party system, which aids to the polarization development in decision making [72]. Similarly, the United States is a compilation of 50 individual states and has politically divided geographic regions which contribute to polarization [34]. However, polarization is not only occurring due to the political system. Media is often partisan, even hyperpartisan at times, [99]. This aspect highlights that while polarization has been a recently discussed theme, this

characteristic of US media has been around since colonial times [27]. Polarization also expands to citizens' attitudes, where an increase ideological distance has been seen since 1990s [19]. American society is also culturally polarized along political lines [34]. Partisan issues include immigration, abortion and gun control [33, 71] and Americans are aware of the partisanism, which can make them even more partisan [103].

**3.1.2 Polarization in Finland.** Unlike the United States, Finland has traditionally been resilient towards political polarization. First, its political system and society is setup differently from the U.S. Like many other European countries, Finland uses a multiparty system and has ten different parties in the parliament at this time. Furthermore, the country has high ethnic homogeneity and is characterized by Nordic values which manifest as high societal trust, including high trust among citizens and between citizens and the government [18]. The high ethnic homogeneity stands out even within several European counterparts and Nordic nations. Furthermore, Finnish politics has been consensus-driven and corporatist, that is, political parties and trade unions have negotiated together when larger social changes have been implemented. Their degree make Finland different from other European and Nordic nations. These factors would contribute to a decrease of political polarization and provide a different historical context for polarization. Indeed, few issues have polarized the Finnish public at a national level historically. That said, recent developments of immigration and an increase in asylum-seekers has increased polarization across the nation [10, 122]. This can be in part connected to the global increase of political populism [26, 70, 122, 125], as one party is driving the immigration agenda strongly [68].

## 3.2 Participants and Recruitment

This study draws on semi-structured interviews [107] with citizens from different publics to understand the potential opportunities and challenges of different approaches for mitigating polarization through social media re-design. The study was initiated during Summer 2018 and was completed in September 2018.

We conducted a total of 19 interviews with members of different publics. Nine were with political experts, who we define as people whose work includes participation in the mediated political discussions or have explicit focus centered around reporting on political events and other political news, such as journalists, governmental officials and political elites. Ten were expert citizens who use social media in the context of political interaction, but do not have a similar work-related connection to the theme.

Moreover, from our total of 19 interviews, ten interviews were conducted in Finland with Finnish citizens, and nine were conducted in the United States (US) with US citizens. Table 1 briefly summarizes the background of our interviewees which spanned different age and gender populations, somewhat biased towards younger males who are more active on politics in online spaces [11]. The interviews for expert citizens lasted on average 60 minutes (min: 42, max: 84). The interviews with political experts were somewhat shorter with a similar average but higher variance (min: 32, max: 83). We chose to limit the length of interviews with political experts. Elite interview guidelines [83] and our prior experience suggests their time is limited, and time for extensive interviews may not be available.

We recruited participants for the study through a multi-faceted effort, including postings on public social media accounts and social media outlets such as Facebook and Twitter. The research team also sought connections through their personal networks. Namely, two authors have connections with media entities in Finland and the US, and actively recruited through their networks. In addition, snowball sampling was conducted after each interview.



For expert citizens, participant eligibility was determined by an interest in politics as well as use of at least one social media platform, while eligibility for political experts required that they were professionally engaged with political content, or immersed in the public sphere as politicians, government official or similar elite role, and were also users of social media. This was important as we wanted to ensure our participants were both familiar with the political system as well as with social media platforms.

### 3.3 Data Collection

The interviews were semi-structured and conducted similarly both in the United States and Finland. The semi-structured interview protocol was divided into three major sections. The first section asked informants for background information, and explored how they were using social media to engage in political interactions. The second section sought to understand how our participants felt about the various social media platforms they use with respect to political interaction, and if and where they might be improved. This was unguided task where we asked them to identify problems and think about how they might solve them. The third and final section was inspired by design research methods. In utilizing this method, we designed a total of four interfaces that each underscored a different public sphere value (as per Habermas), which we had participants go through one at a time. This form of inquiry served as a probing device such that the research team could uncover people's conceptual models for how they might react to potential design opportunities to mitigate polarization. We describe this method and our interfaces in greater detail below.

### 3.4 Data Analysis

In regards to the data analysis, we focused on the second and third part of the interviews, while the first section will be used to contextualize our participants and their views. The interview sessions were recorded and transcribed for purposes of analysis and the coding process was continuous, and utilizing an approach consisting of open and axial coding.

The Finnish and U.S. research team members met several times to jointly interpret the various design probes and to discuss reoccurring themes found in the dataset. After an initial round of coding across the two teams, a collaborative coding approach was adopted [113] as a mechanism for developing a shared conceptualization of emergent phenomena. We then conducted iterative and inductive analysis of our interview transcripts using open coding [107] across our two field sites. During this time, phenomena were identified, named, and categorized.

From this, several codes emerged, which were merged into several overarching categories through axial coding, into two major categories related to how design can depolarize or polarize the public sphere [107]. Our prior familiarity of deliberative democracy and previous works in the area of depolarization have sensitized us to these ideas and their critique. Therefore, the classification did not emerge from tabula rasa, but rather, like is often the case, from your previous engagements with these questions [119]. However, instead of applying a predefined classification framework on potential themes, our aim was to “give voice to the data” through an open analysis approach.

### 3.5 Design probes

We used four different user interfaces to seek participant feedback and insights (see Figure 1). These designs are an extension of previous work [89]. The designs cover several aspects of the design space: they target either the consumer of social media (Figures 1a and 1c) or the creator of new content (Figures 1b and 1d). They demonstrate algorithmic recommendations (Figures 1a or 1b) or recommendation through social context (Figures 1c and 1d). The object recommended is either several links (Figures 1a and 1b), a single link (Figure 1c) or discussions about a link

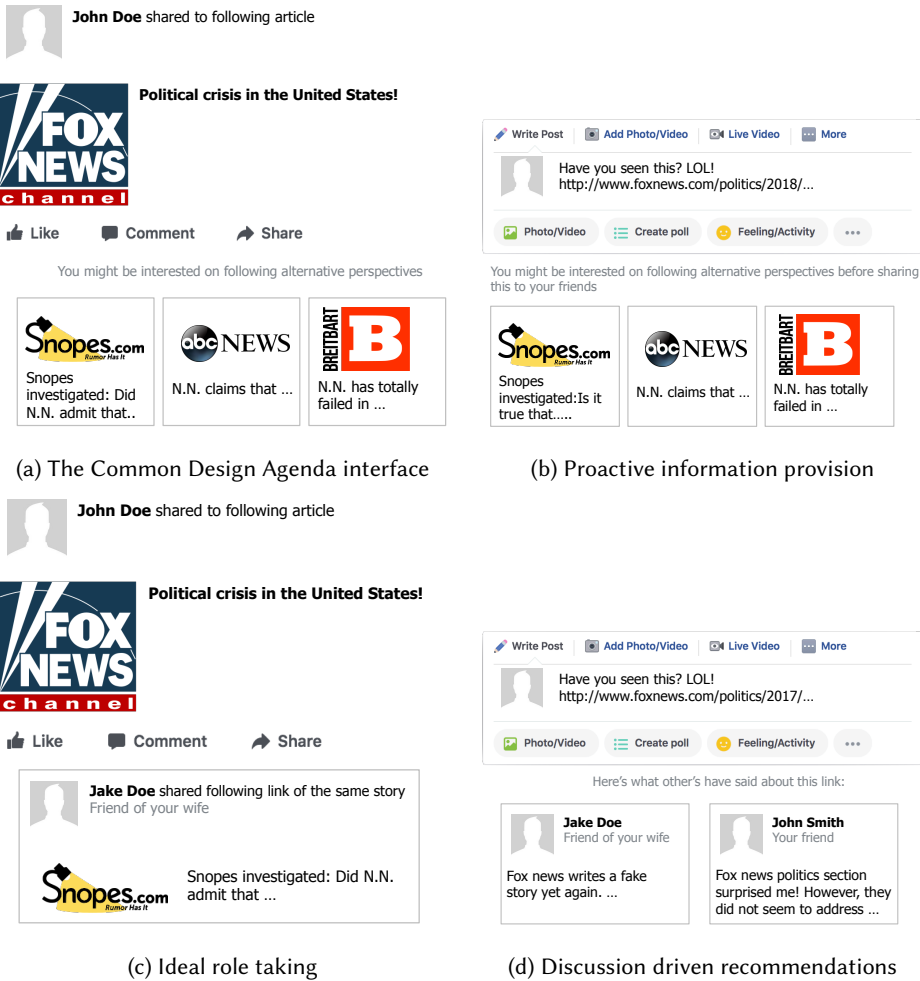


Fig. 1. Speculative design user interfaces, adapted to U.S. media context. For Finnish media context, see supplementary online material.

(Figure 1d). They also present different number perspectives present from three (Figures 1a, 1b) to two (Figure 1d) to one (Figure 1c) additional perspective. In this work, we expand prior work [89] and propose designs to inform Habermas' values, following conceptual design inquiry [111].

In adopting this perspective, the designs we developed do not draw on fiction; rather, they are based on existing social media platforms. Our designs mimic the user interface currently used by Facebook. In terms of user-interface novelty, these could be implemented in the present. However, in terms of automated content analysis, such systems require extensive detection of political leaning and bias – or extensive human curation. We believe that this similarity would ensure that our interfaces could be readily understood by informants and they could position the interfaces as part of their everyday life. We use these probes as a tool for critiquing design (e.g., [101]), such that we can inform the potential re-design of existing social media platforms to better support political interactions and engagement across diverse publics. Our use of these design probes acts as value



statements in the interview process, thus using the statements instead of questions to open the conversation with our informants [value statements are used by social scientists e.g., 106, 121].

Our approach to use design probes to reflect values is influenced by increasing research applying speculative and critical design tools [3, 101]. However, speculative and critical design use confrontation [30] or exaggeration [16] as to emphasize the design research process. While approaches such as adversarial design [30] or design fiction [16] can be used as a tool for social critique of technology. The extent they can be used in more social science motivated research (not design research) is an open question. Research methods for social science oriented design research are only emerging [for example, design sociology 74]. Both design research and social science motivated studies can drive particular theoretical concepts [111]. However, we consider that over speculative interfaces – where it is obvious for participants that they are speculative and not intended for use – may limit their utility for social science oriented research. Therefore, our choice is to use probes which could be deployed already today to engage participants’ thinking about mitigating polarization. However, they are not indented to be design explorations but rather manifestations of potential naive implementations of Habermas’ ideas.

**3.5.1 The Common Design Agenda interface.** This design implementation provides alternative sources for the same news story under the shared story (see Figure 1a). The interface incorporates a simple persuasive design technique to reduce the effort needed to find alternative sources of information [37]. Based on previous work, the balance of recommended content is vital for acceptance, and the links provided are to sites which provide alternative perspectives—that is, sites that both support and counter the media content [86, 87]. This design is the baseline condition, which is used to challenge three additional design concepts.

Expanding the idea of balanced content, we intentional used three different content types in link recommendation. Instead of focusing on different perspectives present in editorial media [86, 87], we wished to reflect the current media environment where digital-only outlets can be easily setup. Therefore, there is a link to a fact checking site (Snopes and Faktabaari), link to a highly rebutable private media site (ABC News and Helsingin Sanomat), and, a source with the reputation of extreme bias (Breitbart and MV-lehti). In other probes, we also used a well-established partisan sites (Fox News and Vihreä Lanka). The sites were similar kind across the two research sites. We used the range explore how our interviewees react to such diversity, and what such reactions tell us about ability to create a public sphere across diverse opinions.

**3.5.2 Proactive information provision.** Increasing participants’ knowledge on a topic is a key aspect of deliberative democracy. For example, deliberative minipublics—a formal method developed to enhance citizen participation into political decision making—include several efforts to provide information before decision making [95]. The aspects of gaining knowledge is seen so critical that many studies report knowledge gain as an output variable of the processes [39, 112].

Following these ideas, this design seeks to provide users with more information to help support discourse in the public sphere. In the common design agenda implementation, the new information provision seeks to help the reader assess content and formulation and informed opinion. However, by providing the information to the poster (see Figure 1b), the interface can promote *diverse and well-informed discussion* by increasing information based on which the poster can draw out his conversation opening post, and engage in rational discourse through factual reasoning. We reasoned that a balanced perspective provided for the initial post may help to set the tone of conversation and lead to depolarization.

**3.5.3 Ideal role taking.** Habermasian thinking on political participation highlights considered judgment as part of a decision-making [39, 110]. Different arguments should be evaluated when

considering ones' own position on the issues. One aspect of this process relates to acknowledging that people may have valid reasons to disagree with a position—which is suggested to lead to approval of those alternative positions [115, 127]. First step in this process is to acknowledge that opinion differences exists.

This design draws on the these ideas (see Figure 1c). We implemented this by recommending alternative news sources through a social contact, or, through social recommendation. We believe that by connecting people to others design could direct people to consider reasons why others think in such way, thus promoting *ideal role taking*. Furthermore, having a social contact reduces the risk that alternative perspectives are not considered, or that someone is alienated and of lesser social value [82]. We envision that in this type of interface, people would be more engaged with alternative sources to understand perspectives other people may have.

**3.5.4 Discussion driven recommendations.** Extending from the ideal role taking, the ultimate goal of deliberation is to help participants to engage in polite and well-justified discussions on public issues [54]. Habermas' core argument [54] was that such spaces for encounters have become increasingly rare in the modern era. However, after the rise of the Internet, several scholars have suggested that the online spaces can serve for such purposes (e.g., [23]), but concerns of selective exposure and polarization have challenged these hopes (e.g., [7]). Based on Habermas' ideals, discussions should include the plurality of perspectives on the topic, to allow people engage them together and explore them. The benefits emerge not only from seeing the plurality of ideas: people are more likely to accept alternative perspectives and decisions if they see how those are rationalized [127].

This design draws its motivation from these aspects. By introducing people to other, diverse, discussions (Figure 1d), we are promoting engagement in discussions with other people who hold diverse perspectives from different publics. Furthermore, this idea extends ideal role taking, as now people are shown opinions of other people as well. We envision that these type of interfaces may support more discursive political participation on social media platforms.

## 4 FINDINGS

While the aim of our designs was to decrease political polarization, based on informant accounts, our participants highlighted both the positive and negative implications of designing for polarization. That is, they highlighted an inherent dilemma: by designing for depolarization, the designs themselves might create or spotlight polarization. As described by FI-P1:

...this [cultural probe] is based on escalation [of polarization]

Similarly, US-C3 stated:

I feel that [this design] would split [readers] more because it is giving very liberal and very conservative links on the bottom.

Furthermore, informants highlighted that these interventions will only function if users are to some degree open-minded and amenable to alternative opinions. As FI-P4 explained:

people who have made their mind already and not open to change it.

Thus, informants suggested that those kinds of users may not benefit from the alternative designs proposed. Similarly, for our informants who were part of the expert citizen category, they described how they may not benefit from such interfaces as they are already actively seeking information and alternative perspectives. However, self-evaluations tend to be more positive than actualized behavior.

What these accounts highlight is that designing for depolarization is seemingly contradictory. To decrease polarization, design approaches may need to make polarization and polarizing opinions

more visible. In the sections that follow, we describe informant interpretations of our designs as manifest in Habermas' values. Specifically, we report our findings as related to how design can serve to decrease polarization, and where design can increase polarization. Across both primary sections of the Findings, we also elaborate on cross-cultural issues (RQ3) related to designing to decrease polarization, and how cross cultural issues can create added complexity.

## RQ1: Decreasing Polarization Through Design

In this section, we highlight how design can serve to decrease polarization, namely through: nudging users towards more informed public sphere discourse, and social recommendation as promoting ideal role taking. We then highlight cross cultural differences in thinking about designing for depolarization

### 4.1 Nudging towards informed public sphere discourse

Informants highlighted that all four interfaces (Figure 1), including the Common Design Agenda interface, provide people more information which they felt could lead to more informed and rational discourse on a range of topics. As US-P2 states, even the Common Design Agenda (Figure 1a) interface was designed in a way such that it could support political discussion and potentially increase civility of the discussion:

[ - - ] it could help discussions if people were not just yelling at each other but they were able to see the other perspectives and take a step back and do a calmer discussion and not, like my opinion is the only way because they have read the other perspective. So they kind of like can see where I am coming from

Importantly, our designs were developed in a way such that they were proactively providing users with additional information that could guide their interactions in the public sphere (Figure 1b). In this interface, we transferred the logic so that it targets the poster when they are writing these answers. Indeed, our interviewers observed this aspect: the design was seen as a method to nudge people to consider posting content and consider the implications of sharing it:

I like this interface. [What makes it likable?] It provides people with information when they are making the decision [to share something]. (FI-C5)

This [interface] has a different premise. When the user is doing something, then we engage with that mental state by showing that there might be also something else relevant here. It may be that user is slightly more open for alternative perspectives. [ - - ] I believe that this intervention would be more effective. (FI-P2)

Without a prompt by us, some interviewees referenced strong feelings such as anger or provocation when answering our questions. They believed that the designs, in being more proactive, allowed for "cooldown" time to reconsider their interactions in the public sphere. As such, these findings illustrate that proactive design can lead to a more informed public in service of promoting rational discourse and information seeking behavior:

This [interface] decreases sharing when you are provoked about a news story. [ - - ] [It shows that] there are many alternative truths for this. (FI-C1)

I think it would cause people to take a beat before they post something. [ - - ] showing them the other alternative might stop rage posting [ - - ] (US-C2)

These findings suggest that design can serve to depolarize the public sphere, as the engagement with diverse opinions and perspectives can serve to enable people to engage in more rational discourse.

## 4.2 Social recommendation as promoting ideal role taking

Our designs also utilized social recommendation techniques to support ideal role taking, and thus, lead to better political discussion (Figures 1c and 1d) We observed both of these being motivated in our interviews. Interviewees envisioned two alternative manners these methods could lead to depolarization and improve political discussion, and these methods differed across cultural contexts (RQ3).

From the perspective of our Finnish informants, people highlighted the importance of understanding other people's perspectives. As previously described, Finland is a homogeneous country, and so the design of systems was directed more towards understanding the nuances and differences in people's political perspectives.

Interviewees highlighted that seeing another person, socially close to you, to share news stories with an alternative perspective *increases the motivation to open any given link*. Interviewees suggested that they would like to understand the perspectives being disseminated by others, and understand his/her motivations for such practice. Therefore, they suggest that our interfaces promote ideal role in political discussions. As explained by our interviewees:

I think that this dynamics works better. [- -] There is a trustworthy person – it might be that wife's friend directs my thinking here – [- -] why they have shared this particular news story. So these friends guide you to think more that why someone else might be thinking in this manner. Therefore, it would lead you to open me up for novel perspectives. (FI-P1)

I think it would improve [political communication] as this type of personal contact, even if indirect [- -] I think this filters out some of far-outs from the conversation. (FI-C4)

Second, informants outlined the need for social recommendations, in particular with Figure 1c, highlighted that *social recommendations also allow participants seek expertise or engage in further political discussions*. In particular, it was considered that seeing people active on a particular topic may allow them to develop common ground which could trigger additional political discussions across diverse publics:

[A link shared might also be from] opposite minded folks. They could be sharing the same article with a completely different twist. So now you are seeing people who have read the same article as you [and] have seen the same facts as you and now you can engage in that political discussion. (US-C1)

I think that people would click through on that by seeing other friends and what they are commenting on regarding a similar thing. It would encourage you to then insert yourself into a political discussion that you might not have otherwise. (US-P1)

Both of these motivations demonstrate that there could be value in social recommendations for depolarization. Both mechanism identified by our interviewees lead to increased motivation to understand other people's perspectives of politics, even if they are from potentially polarizing perspectives. These could even lead to compassion emerging in social spaces – which would lead to more civil discussions. As described by US-C4:

I think that people would be more apt to find out about how individuals in their network feel and think toward political issues and people might actually behave since their comments may affect friends or loved ones.

### 4.3 Cross-cultural differences when designing for depolarization: “One size does not fit all”

As seen in the interviews, Finnish informants and U.S. informants had some differences in their political motivations.<sup>1</sup> Whereas Finnish informants wished to understand other people’s perspectives through ideal role taking (for example, FI-P1 above), our U.S. informants felt that designs should promote connection with people outside of one’s own social circle (for example, US-C1 above). That is, they wished to be connected with new persons to engage in political discussion. Given that the United States is ideologically and socially diverse [34], and that homophily drives people to develop their friend networks with similar people [7, 78], US participants wished to diversify their perspectives through ideal role taking with diverse audiences. However, in Finland the same behavior seemed to lead instead further reflection, potentially linked to perceived shared values [18]. Underlying may also be national norms about political self-expression.

The difference across these countries shows us a potential a cross-cultural difference related to depolarization as drew upon the unique characteristics of their political systems when thinking about the designs of technology for depolarization (RQ3). Thus, the observed differences highlight that one size does not fit all when considering designs for depolarization. We have proposed various factors which may contribute to this outcome, ranging from political climate to deeper national behaviours. Thus, cultural norms and values may play a part in reactions how to decrease political polarization.

### RQ2: Challenges of Decreasing Polarization

In the sections that follow, we explore what problems may emerge when seeking to decrease polarization through digital systems, namely through being outsmarted by the interface, the interface as a stigmatizing force, and engagements with authority. We then highlight cross cultural challenges in thinking about designing for depolarization.

### 4.4 Being ‘outsmarted’ by the interface

Previously, we described how some informants saw the potential for our proactive designs to aid depolarization efforts, but some also noted potential, unintended, negative possibilities. While proactive design could lead to more nuanced and rationalized opinions, others suggested that these designs could also lead users to be more censored with respect to self-presentation. That is, they often anthropomorphized our designs, or gave our interfaces human qualities, suggesting that the system may also be trying to “outsmart” the poster:

[ - - ] when you post something it [the interface asks] are you sure you want to post it? That’s because that is going to affect your image on Facebook. [ - - ] It is like well I do not want my grandma to see this so I do not [post it]. (US-C1)

I think people would be peeved. They would be annoyed that they were intentionally sharing an article [and] for whatever reason and Facebook asked them to reconsider sharing. I think makes people feel like their intelligence is being questioned or their political competency is being questioned. (US-P1)

<sup>1</sup>We stress that with a small sample, the cross-cultural differences observed are illustrative. As we elaborate in Limitations, we believe that a more quantitative research approach is required for clearly establishing such cultural differences. This said, the results demonstrate the potential existence of cross-cultural differences, which we discuss more extensively in the Discussion.

#### 4.5 The interface as a stigmatizing force

Furthermore, just like in the previous design, these designs also presented challenges for depolarization. These concerns were raised in the interviews in both nations and both by citizen and political experts (RQ3). That is, across both cultural contexts, our participants challenged how well the design intervention can support ideal role taking and discussion.

First, the success of these social interventions depend on the diversity of one's friendship networks. FI-P4 articulates this statement well by suggesting that:

...if your circle of friendships is diverse enough to present versatile perspectives, then [social recommendations] may work well.

Habermasian perspective argues that ideal role taking should occur even if the arguments are not made by ones friends. In these designs with idea of deeper social context was to "lure out" ideal position taking through giving identity to the Other. We will build upon this in the discussion, arguing that in short path lengths in social networks [4] created through weak ties [50], establishing a suitable social context can be achieved for most users.

Second, the challenges which emerge from potential stigmatization due to expressing political values:

...[social recommendation] would make them assume that whoever shared the [item] shares the same political beliefs suggested through the Fox News article, which could be wrong. (US-P1)

Finally, when working on such a political domain, any social recommendation must be delicate to avoid potential anti-social outcomes and supporting existing conflicts between the groups. As elaborated by US-P2, seeing alternative sources proposed by people may create:

...more animosity towards those people.

These insights show concerns about expressing political opinions in public spaces like Facebook. In particular, these insights highlight the importance to design spaces which also guide participants towards civility in online discussion to relieve such concerns. Therefore, we conclude that while social recommendation techniques demonstrate promise to lead to depolarization, there are many concerns which must be extensively balanced before these mechanism are adopted by users.

#### 4.6 Engagement with "authority"

The final observation does not tie to Habermasian ideals to develop interfaces. Rather, it relates to Habermas' concerns on the structure of public spaces for political participation.

For example, participants explored how different biases or manipulations could be generated through direct content recommendation. They used the term algorithm to discuss about the power which is incorporated in the implementation of any recommendation system. As described by FI-C4:

...these things presented by [recommendation system], well, I think they are directing [the public opinion].

Similarly, US-C3 stated that it is important to

...give the user flexibility to just post whatever they want without any influencing [- -].

In particular these concerns were present in the choice of content to recommend. Its partisan distribution required careful considerations to show balance, thus urging US-C3 to suggest that:

...create a fourth or fifth in the middle that would be neutral and then on the left it would be too liberal and then on the right too conservative. It doesn't matter what



order, but just as long as there's an equal number of liberal, conservative and then a neutral.

We had intentionally designed our interfaces such that they engaged users with strongly biased news sources, which triggered some participants to argue they do not want to see sites like that. Also it was questioned if interfaces should only recommend content like news stories, or if they could include more background information on the phenomena to increase overall knowledge on the topic, or for example, government documents.

#### **4.7 Cross-cultural differences as creating new design challenges for decreasing depolarization**

Through a deeper analysis of our findings, we find that cross-cultural differences may exist (RQ3), which can create further challenges when thinking about how to best design for depolarization. In the U.S. context, we observed how the underlying political values embedded within interfaces can backfire—that is, informants described how they believed these interfaces had political intentions and could subsequently marginalize their perspectives and values. For example, our U.S.-based informants described how they felt as though they were being “outsmarted” (Section 4.4) by the interface. In the Finnish context, however, informants were more open to a value-laden design approach. Across cultural contexts, we observed that in informants both countries were concerned with the algorithmic power invested by corporations developing these interventions.

One possible explanation for this is that the U.S. is politically and ideologically diverse [43], and the media ecosystem in which people are embedded is not value neutral (i.e. CNN versus Fox News) [67]. As such, people have been thinking deeply about how they engage with authority, who is behind the information ecosystems that disseminate information, and have developed a distrust towards systems that do not align with their values [49, 55]. Finland, unlike the U.S., has been far more ideologically and politically similar, and is also a society marked by high societal trust [10, 18].

This indicates that future work must be done to better understand how to make value-driven interfaces more acceptable across cultural and country contexts, as opposed to being viewed as complicit in escalating political polarization through underlying political agendas, as elaborated by our informants.

## **5 DISCUSSION**

Design is complex as it requires careful assessment to ensure that it is having the desired effect and not countering design intent. In this study, our design probes were focused on depolarization, but after careful analysis, we also found that it could serve to polarize. Furthermore, we observed potential cross-national differences in terms of reactions to our proactive and social recommendation design probes. Thus, there does not exist a one size fits all approach that works for all people around the world. The design, and use of artifacts (i.e. prototypes), also demonstrated the ability of this type of approach to shed to on uncover people's values related to how they think about political discourse. This could help designers to depolarize platforms by (1) re-purposing context collapse and (2) making the socio-technical systems transparent. Lastly, we reflect on ways in which design can be used as a tool for social science inquiry.

### **5.1 Re-purposing context collapse for depolarization**

Informants highlighted several benefits which emerged from social media content recommendation, such as increased motivation to read alternative perspectives, which supports media literacy, and wanting to discuss associated political events with other people (Section 4.2). However, informants

also pointed out in order to follow-up, one must have diverse friendship pool, something they acknowledged might not be achievable, or depolarization effects would be diminished or remain unchanged. This concern is surprising, as it counters extensive research on context collapse.

Context collapse refers to impression management in an online environment where a user may have many people from various social circles following them on the same platform, and the ways they may need to manage their activities, or behavior, given a broader audience than they may experience at social events in real life where social groups are more separated. [75, 76]. As elaborated by Goffman [48], we often manage our self-concept by drawing on the rules and norms present in our social environments. In the context of social media platforms, context collapse makes it difficult to manage impressions of ourselves given the range of people who are bound together in a singular environment, coming from various social contexts (such as, elementary school classmates, work colleagues, family and friends). Rather, as explored by Marwick et al. [75], social media users, on platforms such as on Facebook and Twitter, tend to collapse multiple audiences together. There have been various design implementation created to help people manage and segment people by audience to whom content is shown (for example [69]). However, such designs carries the potential to contribute to the creation of a public sphere(s) which are heterogeneous, and not diverse, if niche target audience is created from a list of preexisting friends and contacts.

Instead, we suggest the potential for context collapse to also be used as a depolarizing force. The social media followers of individuals, especially when also counting friends-of-friends, may be diverse enough to show social content recommendations across the political spectrum. Previous research highlights the prevalence of weak ties in social networks [50] and how the average path length connecting any Facebook users is less than four [4]. This suggests that a large social media platform might be able help expose users to people with different perspectives, and potentially different political opinions, given the large number of weak ties in a user's network. However, more diverse political engagement on social media creates challenges such as stigmatization and anti-social outcomes, as also suggested by our informants. These types of issues are not new as we have seen how social media platforms have inadvertently exposed personal information such as a user's sexual orientation [64].

Given the various issues that might arise from different designs, the benefits, and challenges, of context collapse, especially as it relates to political deliberation, must be carefully considered. For example, in cases that include sensitive or stigmatized disclosure (e.g. talking about sexual assault) interfaces should promote selective exposure to close friends only. For cases that involve political deliberation, context collapse should be used to promote diverse interactions, as a means of enforcing diversity in political interactions. Doing so would help messages to achieve a depolarization effect as they spread across the various social contexts one has in their social networks. Furthermore, careful consideration should be paid to developing more private spaces for political participation as they do not benefit from increased social contexts associated with context collapse.

## 5.2 Making socio-technical systems more transparent

Our informants were skeptical with respect to the power of social media platforms (see Sections 4.4 and 4.6) and responses echoed discourse from critical algorithm studies in regards to power and agency [47, 66, 91]. However, we also heard that the informants were concerned with political expression, in addition to the lack of algorithmic transparency. Thus, our informants extend Habermas' [54] critique of a public sphere shift towards a more centralized and controlled space, which effects political discussion.<sup>2</sup>

<sup>2</sup> Most academic debate on online spaces and Habermas' work has focused on the problems of rational and civic discourse. According to many studies, achieving an idealized public sphere challenging [among others, 24, 96], see also 'Literature

Therefore, our research brings an additional dimension to the transparency and algorithmic gatekeeping literature. Gillespie [47] discusses the interconnection between algorithms and relevance and how there are calls to increase the transparency of algorithms [29]. These debates are often focused on the replacement of traditional gatekeeping—where editorial (humans) select which information is relevant and passed on to the public—to an algorithmic gatekeeping system on platforms that makes decisions without that aid of humans [15, 123]. However, informants' reactions extended beyond issues of gatekeeping: they asked how our design probes might impact social interaction with political discourse. This is an important observation, and insight, as scholarship has highlighted how digital systems design is an act of power [124]. In regards to design and its ability to specifically shape political engagement, informants were concerned with how our design probes may negatively impact political expression and social interaction, which extends beyond the intent of merely designing for depolarization. Thus, returning to Habermas: participants were concerned with how design shapes the public sphere and how the different probes in the study impacted interaction and were less concerned about content (gatekeeping).

We believe that our suggestions, such as relying on trusted recommendations from friends, are more transparent than targeted advertisements that may lack proper attribution or disclosure of the funding source. Therefore, substituting less transparent authoritative content recommendations with our designs that are more reliant on recommendation from trusted sources within our networks, could aid transparency and efforts to depolarize public discussion. Based on the reactions from our informants, interfaces that involve political information, and discourse, should be transparent, not only in terms of content, but in how they may impact political engagement and discourse, as well. Therefore, if the recommendations we suggest are implemented, they need to be explicitly acknowledged.

We understand that transparency makes companies vulnerable to competitive pressures, as well backlash and critique. But without visibility into how platforms work and are intended to shape interactions, users, regulators, and researchers will not be able to monitor and evaluate corporate and unintended design influence. The social media industry would benefit from greater collaboration and deeper engagement with corporate social responsibility in order to ensure a healthy media environment and political discourse [52].

Calling for transparency requires transparency on our part as well. We acknowledge that our research as well has a clear value-driven approach. The Habermasian approach is one of many available to support online political discussions [25]. However, its normative framework its suitability for empirical cases like this is still being debated. However, the positive empirical outcomes in this study suggest that Habermas' ideals can be used to design for topics like polarization, and that this approach may be used for value-driven design.

### 5.3 Localization of political interfaces?

Our research observed two clear differences between Finnish and U.S.-based informants. First, while Finnish informants sought to understand others' perspectives, in the United States the same interface was seen as a tool to find new people to engage in political discussions and to network (Section 4.3). Second, the attempts to intervene proactively were seen harmful in United States while liked in Finland (Section 4.7). However, these findings call for further investigations and reconsideration on interfaces which support in political engagement and discussions.

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review." Our work instead focuses on the infrastructuring of the public discussion, critical to the outcomes of participation [38].

As technologies are not neutral [92, 124], technologies for political engagement are obviously non-neutral as well (see previous subsection). When developed to a particular national and socio-cultural context, they may present a national habitus. The same habitus is present when the interface is used in other national and socio-cultural contexts. For example, the work on mitigating political polarization is mostly based on research conducted in the United States. One research area has been connecting the two parties in a highly partisan media environment, either by asking people to read content from diverse sources or connect with people with opposite perspectives. Therefore, it appeared that U.S. based informants saw opportunities in developing personal networks. Same cultural probes lead to more consensus building and balancing one's opinion with Finnish informants. This can be related to Nordic culture, where consensus is often sought for in political decision making [56]. What type of reactions might emerge in an Asian collectivist culture, where they stress communal wellbeing and harmony [118]?

Following from this discussion, we also need to revisit our discussion about theoretical perspectives, which we started in the previous section. The interfaces were developed to drive a particular normative agenda, in our case, Habermas influential work on public sphere. Articulated differently, we used a German philosopher and sociologist with theory emerging from development of political discussions in central Europe. His ideas might not fully respond to the needs from a different historical context, like that of the United States.

So, these two observations together lead us to ask should there be *localization* of values and norms as well, not only for texts and images? That is, if we accept our initial observations and related discussion about values and their contextual: there cannot be a global single interface for political participation and engagement. A softer version of this, that different organizations may require value sensitivity in their information systems has been well perceived [61, 93]. However, we seek to expand this thinking to a global scope. Our results indicate, interfaces for political discussion must be considered in the light of national habitus and socio-cultural context.

In this work, we can only expose this issue. We do not yet have – partly due to lack of comparative research on political interfaces – enough observations to make a strong argument for or against this type of localization. Already now, researchers are explicating the need for non-Western, educated, industrialized, rich and democratic (WEIRD) in fields such as economics and human-computer interaction, like interface design principles [116]. To achieve localization, there is a need for an adaptive system that could change aspects like social matching criteria, content recommendation algorithm and even affordances for self-expression based on participants' socio-cultural background. The first step in this process is to develop approaches to discuss about such localizations: beyond language and writing direction, what aspects should be accounted for? How they could be expressed in a machine-readable form?

#### 5.4 Using artifacts for social science research

As we show, through these design probes, people were able to prompt and inform us about values relevant to design practice. While speculative design, and even participatory design, often use prototypes to, as described by Muller [84], have end users think about new technology “in relation to applications they have not previously experienced,” in our study we used a method inspired to understand and uncover people's values relative to existing and familiar technologies. A main difference compared with speculative, critical and adversarial approaches [3, 12, 13, 16, 30, 100, 108] is to focus on design probes which could be implemented already today. They did not have exaggeration or adversarial components to indicate to participants that we consider them “speculative.”

Through this method of inquiry, our interfaces prompted our interviewees to critically reflect on the benefits and challenges in designing for depolarization as related to how they think about the

design of existing socio-technical systems. As such, our findings followed ideas of provocative statements used in social sciences and CSCW research previously [106, 121]. Instead of verbal statements, we used manifestations of design directions. Each design was constructed using conceptual ideas [111] and manifest them. As we in our findings and subsequent discussion, participants' reflections allow us both to challenge current design practice (context collapse) and address system-level issues (companies as part of the public sphere). In this view, the use of artifacts for value driven inquiry can allow designers to unearth interface level values, as well as broader, socio-political values that surround technology use and design that might impact how people perceive and use socio-technical systems.

While CSCW and HCI research is deeply engaged with social scientists, the output is often the development of novel technologies and there have been calls from the academic community for more social science research via research-through-design. For example, Lupton [74] suggests that design sociology can "fruitfully incorporate the strengths and foci of design-oriented research approaches while maintaining the critical and sociocultural emphasis of traditional sociological inquiry." Most importantly for social science theory, our research approach builds on low-fidelity prototypes (or design probes) that articulated conceptual ideas [111], in our case Habermas' influential work in social sciences. The research approach builds on a core skill within the human-computer interaction research: constructive approaches, where various approaches can be used to manifest novel ideas [94]. Therefore, we believe that CSCW researchers may in the future collaborate with social scientists, bringing their unique skills in design [which are missing from social sciences 74] to support not only research of new technologies but also understanding fundamental questions about our society. Through our brief engagement with cross-cultural analysis, this works suggests how these may be formed and how cultural probes help to analyse national habits.

## 5.5 Limitations

We acknowledge that our study has several limitations. First, this study is based on a small number of participants, whereby we utilized a snowball sampling technique. Second, we do not know how representative our sample was of either Finland or the US, which is especially salient since we focused on politically active social media users; the sampling strategy was strategic. Comparative research tradition emphasize more quantitative approaches, and thus the cross-cultural findings should be seen as indicatory. However, our participants came from different educational and professional backgrounds. They are also diverse with respect to age, gender, and identity. In an attempt to limit issues with snowball sampling, we found informants from multiple seeds, and also recruited through a range of other avenues, including postings on social media, which helped diversify our sample. Moreover, the goal of this research was not to generalize to the entire population of either country under investigation; rather, our goal was to understand how design could serve to limit polarization, whereby we were building on prior work in this important research domain.

Second, this research project is not value-neutral. Habermas' theory is normative, it discusses about an ideal state, and our cultural probes are motivated through advancing an ideal state. For example, Nelimarkka et al. [90] highlight that when working with such normative frameworks in evaluation or design, authors should be careful on their articulation. Indeed, there are several potential normative frameworks which we could have advocated [see elaboration from 90, who also use Habermas' framework]. Our drive to focus on supporting the public sphere in these issues is driven by the benefits deliberation has been observed, even in highly polarized contexts (see Section 2.1 for review). However, we believe that the observations we draw: challenges on working with any value-driven environments across cultures and concerns related to socio-technical

systems are not specific to Habermas' work, but more general to studies seeking to influence political discussions.

Finally, our study does not speak on the performance of the proposed interfaces. Our results are based on expert evaluations. To formally evaluate the success of these interfaces, one would need an alternative research design. For example, survey experiments could be used towards this direction. The interfaces could also be developed as functional for small groups [21]. However, as we mentioned, the interfaces require advanced text analysis to explicate political positions. Therefore, the empirical evaluation may require wizard-of-Oz technique, limiting study opportunities. The empirical performance of these interfaces is a future research question.

## 6 CONCLUSIONS

This study investigated ways to (re)design for depolarization in the public sphere, which the research community can further explore in future research. Our findings demonstrate the challenges to mitigating polarization given how people are using the public sphere to interact, and the number of multiple platforms that they are using. Users are becoming more aware of platform influence on system design such as content recommendations, which signals the need for more transparency regarding the design process. Through the use of design probes, we found that explicitly articulate values and norms may help to increase transparency, but also provoke reactions that may encourage entrenchment with polarized beliefs, and also introduce skepticism which could lead to increased polarized assessment and thinking.

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