

**Communicative Inequalities in Online Political Discussion: A Study of Discussion Forums
from 54 Societies***

Hai Liang, City University of Hong Kong

Fei Shen, City University of Hong Kong

*Direct correspondence to the authors at the Department of Media and Communication, 18 Tat
Hong Avenue, Kowloon, City University of Hong Kong, HKSAR <rainfireliang@gmail.com>
<feishen@cityu.edu.hk>.

Communicative Inequalities in Online Political Discussion: A Study of Discussion Forums from 54 Societies

Abstract

The present study examines political discussion forums from 54 societies and links communicative inequality to features of cultural traditions, value orientations, and political systems. Results show that inequalities among discussion threads in attracting readers' attention and responses exist in all discussion forums. Most of the discussion threads received a small number of views and replies while only a fraction of them became popular. Most importantly, we found that communicative inequalities in online political discussion forums are subject to cultural and political influences at the societal level. Discussion threads received relatively more equal treatment in democracies, individualistic cultures, low power distance cultures, and yet less rational societies.

Keywords: Communicative inequality, political discussion, participation inequality, attention inequality, discussion forums

Introduction

Communicative interaction among citizens is vital to democracy (Carpini, Cook, & Jacobs, 2004; Dahlgren, 2002; Dewey, 1954). Whether the Internet improves the quality of political discussion has caused much debate in existing scholarship. The Internet is said to increase users' autonomy, reduce structural constraints (e.g., Mitra, 2001; Papacharissi, 2002, 2004), and shift the nature of discussion by harboring a wide variety of perspectives and voices (Himmelboim, Gleave, & Smith, 2009). Nevertheless, abundant studies have suggested numerous

types of inequalities in online political discussion (e.g., Albrecht, 2006; Himmelboim, 2008, 2011; Schneider, 1996).

Equality is one of the important dimensions that guarantee the quality of online political participation (see Dahlgren, 2002; Janssen & Kies, 2005). An ideal situation requires each individual to be involved in the communication process (Schneider, 1997), and expects the absence of dominance by any groups (e.g., males vs. females; liberals vs. conservatives, etc.) (Graham, 2002). Most previous studies adopted a discrepancy analysis paradigm to judge the quality of online political discussion, that is, to compare the distribution of participation against an ideal equality yardstick (Janssen & Kies, 2005). But we argue that, to assess the levels of democracy in online political discussion, one should go beyond such paradigm because inequality always exists. Finding inequality adds little to what we already know. Given that the degree of inequalities might vary with sociopolitical context (Janssen & Kies, 2005), to compare inequality across societies could be one valuable alternative approach to take. Unfortunately, most existing studies on discussion forums focus on one single country (e.g., Albrecht, 2006; Himmelboim, 2008, 2011; Himmelboim et al., 2009; Schneider, 1996), which makes cross-national comparison impossible.

Against this background, we aim to examine inequalities of user attention directed to conversation threads in online political discussion forums from 54 societies. We first distinguish two types of communicative inequalities concerning political conversations: participation inequality and attention inequality. Participation inequality speaks to the difference between those who express themselves online and those who do not – an oft-studied topic in existing literature. Attention inequality, the focus of the current study, refers to the difference between those voices that grab attention and those which receive little attention from other users. We then

test the patterns of attention inequality and examine how it is related to culture and political factors based on data collected from 54 societies.

Literature Review

Online Discussion Forums and Communicative Inequality

In the early days of Internet research, online discussion forum has been celebrated as a democratizing technology by many (e.g., Corrado & Firestone, 1996; Rheingold, 1993). Discussions in web forums are organized in form of conversation threads. A thread is composed of a seed post and a collection of replies to it, usually displayed in chronological order. People can freely initiate a conversation by posting a seed post or join a conversation by replying to a post. When using web forums, users make their own decisions as to whether to read or to reply to a post. The major difference between a web forum and a newsgroup is that newsgroup automatically delivers every new message to its subscribers, while a forum requires users to visit the website and check for updates. In this sense, users of web forums are more selective than newsgroups users. Forums also differ from chat rooms and instant messaging service for its asynchronous communication. Forum messages can be read at any time and people can take as much time as they need to respond to a post.

Due to these characteristics, online discussion forum was often praised for its availability of diverse information, lack of centralized control, free of geographical and temporal constraints. Without doubt, much evidence was found to buttress these arguments (e.g., Hacker, Howl, Scott, Steiner, 1996; Muhlberger, 2004; Schneider, 1996). Nevertheless, one central notion highlighted in different versions of e-democracy theories – communicative equality (e.g. Dahlberg, 2001) – was hardly satisfied in most empirical inquiries. Many studies have suggested the existence of inequalities in both production and consumption of online discussion content. Schneider (1996),

for instance, found a high level of inequality in participation in Usenet newsgroups. Very few of the discussants produced a high proportion of the information. Himelboim (2008) found that the distribution of replies that newsgroup participants sent and received was highly disproportional.

Based on existing literature, it seems that communicative inequalities in web forums could be classified into two types: participation inequality and attention inequality. Participation inequality refers to the gap between those who post messages frequently and those who seldom or never post. Theories of deliberative democracy argue that equal opportunity to express attitudes, desires, and needs is an essential component for healthy democracy (Dahlberg, 2001). All members of a society need to have an equal opportunity to participate in rational-critical debate of topics relevant to their public lives (Dahlberg, 2004; Jensen, 2003; Schneider, 1996). But both structural constraints and personal selection could be the barriers to participation equality. It is well-known that access to the Internet is not distributed equally across groups of different demographic groups but depends on factors such as income, education, and gender (e.g., DiMaggio, Hargittai, Neuman, & Robinson, 2001). Voices of privileged segments of a society are often overrepresented in online political discussion forums (Albrecht, 2006; Davis, 1999; Hill & Hughes, 1998; Wilhelm, 2000). A second cause of participation inequality lies in personal selection. Even if all individuals are online, users might be reluctant to publicize their opinions (Albrecht, 2006; Jones, 1997). Users actively seek content of their own interest and avoid disliked views (Mutz & Young, 2011). The silent majority is another barrier to discussion equality. Those who are politically active produce most of the messages in political forums (e.g., Himelboim, 2008, 2011; Himelboim, Gleave, & Smith, 2009).

Participation inequality was often operationalized as the proportion of messages posted by participants in forums (Schneider, 1996). An unequal forum is one in which only a small

number of users contribute the vast majority of posts (Himmelboim, 2008; Himmelboim et al., 2009; Schneider, 1996). Fisher, Smith, and Welser (2006) examined discussion equality in nine newsgroups of diverse topics such as technology, social support, and politics etc. They found about 26% of users posted only one message in political newsgroups and the distribution of the number of messages posted by each user follows the power-law distribution.

Unlike participation inequality, attention inequality in discussion forums lacks systematic empirical investigation. Jones (1997) noted that the Internet allows us to “shout more loudly, but whether other fellows listen, beyond the few individuals who may reply, or occasional lurker is questionable” (p.30). Similarly, Himmelboim (2011) argues that equal consideration of citizens’ voices is essential for a healthy civil society (Kumar, 1993; Seligman, 1992). Attention inequality refers to the gap between those participants who receive a great amount of attention and those who are not. The chance to be heard in discussion forums might not be equal. One of the central roles of online discussion in promoting democracy is to facilitate information and opinion exchange among citizens. The more information is provided in a forum, the more information and perspectives will be shared among users. But if only a small number of posts are noticed and discussed, the equality of discussion could be possibly hampered.

Attention inequality in discussion forums was usually operationalized as the number of replies received by each participant when they initiate a post (e.g., Fisher et al., 2006; Himmelboim, 2008, 2011; Himmelboim et al., 2009). Like participation inequality, the number of replies received by participants follows a power-law distribution: a small number of participants receive most of the replies. Himmelboim (2011) discovered that attention inequality is even more severe than participation inequality.

Admittedly, tallying the number of replies captures a part of the ‘attention’ concept, but such operationalization blurs the boundaries between user attention and user action. Reading a post and reply to a post requires different levels of cognitive effort. Moreover, most if not all discussion forums allow non-members to view posts but do not allow them to reply. Therefore, since most web discussion forum provides information on how many times a thread is read and how many responses a thread receives, it is better for researchers to conceptually distinguish between views and reply distributions.

Attention inequality arises from the scarcity of attention. Large-scale communication process, such as political deliberation, is governed by the economy of attention (Albrecht, 2006). When plenty of information is available, attention becomes a scarce resource (Nye, 2002). People make their own decisions on joining discussions of a particular topic. Individuals’ self-selection will lead to the “preferential attachment” phenomenon: the rich will get richer (Barabasi & Albert, 1999). People prefer reading the already popular discussion threads due to the limited ability to process a large amount of information (McCombs & Zhu, 1995; Zhu, 1992). This process causes an unequal distribution of attention: a small number of threads receive a large and disproportionate number of views and replies.

Explaining Attention Inequalities in Online Discussion Forums

After explicating the core concept of our study, we now turn to factors that could potentially explain the variance of attention inequality. The two major correlates of attention inequality identified in past studies are group size and discussion topic (Himmelboim, 2008). On the one hand, larger group size could lead to higher levels of inequality. A large group means more posts and thus more choices. Thus forum users’ attention is more likely to be directed to the few already popular posts to reduce cognitive load. Second, attention inequality in political

discussions was found to be less severe than that in health related discussions. When talking about politics, participants are to exchange ideas and to debate on different issues. Posts embracing different values and ideological inclinations tend to have their own followers and supporters. But users in health discussion forums are more likely to seek facts, and thus to reply on users with high credibility and to ignore posts that seem to be less credible, thus creating a larger attention inequality.

To the extent that preferential attachment results from collective behavior, variables at the societal level might provide some useful clues for understanding communicative inequalities in discussion forums. In the ensuing discussion, we focus on three sets of societal level explanatory factors: culture, value, and political institution.

Culture relates to communicative behaviors in numerous ways (Hwa-Froelich & Vigil, 2004). Culture is an underlying framework that determines people's perceptions of reality and choice of appropriate responses in social situations (Johansson, 1997). One of the most comprehensive quantitative studies on culture comes from Hofstede's research on national culture dimensions (Hofstede, 2001; Hofstede, Hofstede, & Minkov, 2010). Among the six dimensions of culture proposed by Hofstede, we consider individualism and power distance to be most relevant to attention inequality. First, individualism means independence and less emphasis on group cohesion. Tan et al. (1998) examined the power of culture on majority influence and found that in individualistic cultures, people are less likely to follow the majority in computer-mediated-communication (CMC) settings than in face-to-face settings but no such difference was identified in collectivistic cultures. Second, people from high power distance societies tend to accept a hierarchical order and without justification for such inequality. Levels of conformity are usually lower in societies with low power distance cultures (Gordon, 1976; Hofstede, 2001;

Williams, Satterwhite, & Saiz, 1998). Conformity means going with the trend. Therefore, people from individualistic and low power distance societies would be more likely to act upon their own decisions and to be less likely to follow the popular threads in web discussion forums, and the attention distribution across different threads should be more equal than that in the collectivistic societies. This leads us to the following two hypotheses.

Hypothesis 1a: Distributions of discussion threads view are more equal in individualistic societies than in collectivistic societies.

Hypothesis 1b: Distributions of discussion threads reply are more equal in individualistic societies than collectivistic societies.

Hypothesis 2a: Distributions of discussion threads view are more equal in low power distance cultures than in high power distance cultures.

Hypothesis 2b: Distributions of discussion threads reply are more equal in low power distance cultures than in high power distance cultures.

In addition to culture, value orientation (Inglehart & Welzel, 2005) might play a role in influencing communicative inequality. Value orientation contains two aspects of political culture: traditional vs. secular rational values and survival vs. self-expression needs. High traditional/secular-rational value means the society embraces secular-rational values over traditional values. Societies with high self-expression value emphasize free expression and quality of life over lower level survival needs. In societies of higher self-expression value, people are more inclined to express their thoughts and ideas online. More expressive participants result in a larger user group and more active discussion. Following the “larger group leads to inequality” argument by Himelboim (2008), we expect attention inequalities in societies of higher self-expression value will be severer. With such reasoning, we propose the following:

Hypothesis 3a: Distributions of discussion threads view are less equal in societies with high self-expression values than in other societies.

Hypothesis 3b: Distributions of discussion threads reply are less equal in societies with high self-expression values than in other societies.

Furthermore, political system could matter. On the one hand, self-expression value has been demonstrated to be highly correlated with effective democracy (Inglehart & Welzel, 2003). The casual direction between self-expression and democracy is difficult to be ascertained, but the correlation between the two is robust and significant (Hadenius & Teorell, 2005) even when normative aspects of democracy is controlled (e.g., responsiveness, corruption). On the other hand, political voices are more diverse in democratic societies than in non-democratic societies. In democratic societies, political participation online is a way to enhance the degree and scope of public participation in governance (Kakabadse, Kakabadse, & Kouzmin, 2003; Noveck, 2003). In contrast, restrictive policies and regulations on online discussion are made to protect political dominance in more restrictive societies (e.g., Tan, Mueller, & Foster, 1997). When diversity is suppressed in non-democratic societies, the distribution of attention tends to be more equal across discussion content with high levels of similarity. In this sense, attention competition in democratic societies is keener.

Hypothesis 4a: Distributions of discussion threads view are less equal in democratic societies than in non-democratic societies.

Hypothesis 4b: Distributions of discussion threads reply are less equal in democratic societies than in non-democratic societies.

Method

Data Collection

The data for this study contains two parts: discussion forum data and country-level predictor data. The discussion forum data was collected in three steps. First, a list of 262 countries with Internet access was obtained from Internet World Stats¹, a worldwide internet statistics organization. Second, a series of Google search was conducted through using a consistent Boolean search term “forums/bulletin boards” and “country name” in both English and languages used in those countries. Not all countries have their own discussion forums. As a matter of fact, for a large percentage of countries, we did not find any. When multiple numbers of discussion forums were found for a country, the most popular one will be used – popularity being defined as having the largest amount of posts in “politics” section of the forums. A total of 54 countries or territories and their corresponding forums were identified (see Appendix 1 for details). It is not our intention to claim we obtained an exhaustive list of all the popular forums but data based on these forums gives us enough variance to test our hypotheses. The list covers a diverse range of countries speaking 18 languages from Asia (20), North America (3), South America (5), Europe (15), Africa (8), and Oceania (3). The list contains 26 out of the top 40 largest economies in the world. The list also has small economies such as Kyrgyzstan, Zimbabwe, and Trinidad and Tobago.

Third, all threads in the “politics” sections of the selected forums were downloaded for analysis. The crawling process spanned from September 2011 to March 2012. We used Easy Web Extract (<http://webextract.net/>), a web scraping software for the crawling task. Most discussion forums use commonly available database management systems (e.g., Diczuz!, vBulletin, etc) which are highly similar in terms of their structures. Each section of a forum contains a table which tabulates all posted threads. Each thread will be given a unique URL address. We scraped all content from the URL addresses of the threads from “politics” sections

of the selected forums. For each thread, the following information was retained: URL of the thread, title of the thread, time and dates of the thread, content of the thread, number of views (i.e., the number of internet users who clicked on the thread to read its content), number of replies the thread received (i.e., the number of internet users who offered their comments), and authors' screen names. A total of 1,218,698 threads were captured. The country-level predictor data were from different secondary sources. Details of these indicators will be elaborated in the ensuing section.

Measures

Attention inequalities. Attention inequalities were operationalized as the Gini coefficients of post view and post reply distributions within a particular forum. Gini coefficient is a well-established and wide-used index for gauging inequality in economics, sociology, and other domains of research. The coefficient has also been used by communication scholars for measuring inequality in online discussion (e.g., Jensen, 2003; Schneider, 1996). Mathematically, the calculation of Gini coefficient is based on the Lorenz curve. Gini coefficient varies from 0 to 1, where 0 means perfect equality and 1 indicates maximal inequality. We calculated two indicators for each country's forum: Gini coefficient of post view distribution and Gini coefficient of post reply distribution. The means for the two measures were .58, (SD=.13) and .71 (SD=.10) respectively.

Culture characteristics. We included the four dimensions of Hofstede's national culture in our study: power distance (PDI), individualism versus collectivism (IDV), masculinity versus femininity (MAS), and uncertainty avoidance (UAI). The data were harvested from Hofstede's official website². All measures were on a 1-120 scale. Societies with high PDI scores tend to accept a hierarchical order and no justification is need for such inequality; societies with high

IDV scores prefer the notion that individuals are responsible for themselves; societies with high MAS scores emphasize achievement and assertiveness more than cooperation and modesty; societies with high UAI scores exhibit low levels of toleration toward future uncertainty and ambiguity. In our sample, the average scores for PDI, IDV, MAS, and UAI were 62.6 (SD=22.2), 42.1 (SD=24.2), 54.0 (SD=12.7), and 65.3 (SD=22.4) respectively.

Value orientation. Two value orientation indicators were used for analysis: traditional/secular-rational values, and survival/self-expression values (Inglehart & Welzel, 2005). The data for the two value orientation dimensions were obtained from the World Value Survey (WVS) website³. We used summary statistics from the most recent wave of the survey fielded in 2006. The average scores for the two dimensions are -.03 (SD=.85) and .01 (SD= 1.02) respectively.

Political system. There are quite a few publicly available scoring systems characterizing the political systems of the countries across the world (e.g., Freedom in the World index⁴; the Democracy Index⁵, etc.). For this study, we chose Marshall and Jagers' Polity IV scheme.⁶ The scheme takes into account three elements: institutions to enable the people to express its political preferences, checks and balances on the executive's power, and the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation. This index of democracy is well suited for our study because it captures the extent to which citizens can express their preferences and civil liberties are protected. The index uses a 21-point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy). Our sample included a wide variety of countries with different political systems ranging from consolidated democracy such as Germany and incoherent authority regimes such as Singapore to autocracies such as Saudi Arabia (M=5.5, S.D. =6.0).

Control variables. Three control variables were included: GDP per capita, Internet penetration, and the total number of threads from the selected forums. Data on GDP per capita was obtained from The World Bank⁷ (M= 16,916 USD, SD= 15,812). Internet penetration data in 2011 were collected from Internet World Stats⁸ (M= 9.0, SD=1.3). The country with the highest penetration rate in our sample was Australia (90%), but there were other relatively less developed countries, for instance, Ghana (8%), Guinea (2%), and Cote D'Ivoire (4%). The total number of threads of the selected forums (M=22,568 SD =41,554) varied from 1,559 (Russia) to 270,462 (China). Both GDP per capita and number of threads were log-transformed before analysis to avoid highly skewed distributions.

Finding

Descriptive Analysis of Attention Inequalities

When discussion threads from all the countries were pooled together, the distributions of post views and replies were highly unequal. Figure 1 shows that only a few threads had attracted a large number of views and replies. On average, each thread received 2,833 views (SD =54,247). For replies, about 18.7% of the threads didn't receive any replies whereas only 975 (.08%) threads received more than 100 replies. The mean of reply frequencies was 129 (SD =40,209). The overall Gini coefficient of view distribution was much smaller than the Gini coefficient of reply distribution (difference =.14, $p < .01$), and the two distributions were statistically different (Kolmogorov-Smirnov test: $D=.87$, $p < .001$). Figure 2 shows the variation of attention inequalities from 54 discussion forums. In most of the cases, inequality in view distribution was smaller than that in reply distribution. The two measures of inequality were positively correlated to each other ($r=.423$, $p < .001$). Most of the forum level Gini coefficients were higher than 0.4, suggesting the existence of inequalities.

[Figure 1 and Figure 2 about here]

Predicting Attention Inequalities

Table 1 presents the findings from regression analyses predicting attention inequalities. Both models presented in Table 1 fit the data fairly well. The R squares for the two models were 44.1% and 47.7%. Almost half of the variances in the two dependent variables were explained. We first examined inequality in view distribution (Model 1). The data showed inequality in view distribution was negatively related to individualism culture score but positively related to power distance scores. Post view frequencies in forums from individualistic societies were more evenly distributed than those in collectivist societies. Meanwhile, post view frequencies in forums from societies of high power distance were less evenly distributed than those in low power distance societies. Therefore, hypothesis 2a and hypothesis 3a were supported. Value orientation turned out to be a significant predictor of view distribution inequality as well. The inequality measure was found to be positively associated with both self-expression and secular/rational values. Therefore, more concentrated attention distribution tended to appear in societies of higher degrees of rationality. Thus, hypothesis 4a is confirmed. However, democracy was not significantly correlated with view distribution. Hypothesis 5a was not supported.

[Table 1 about here]

Model 2 in Table 1 shows the findings from regression analysis predicting inequalities in reply distribution. Neither cultural nor value orientation variables were found to be predictors in our model. Hypotheses 2b, 3b, and 4b were not supported. Interestingly, we found democracy to be negatively associated with inequality in reply distribution. Frequencies of post reply in democratic societies were more evenly distributed than that those in non-democratic societies. Hypothesis 5b was not supported and instead, we found contrary evidence.

Conclusion and Discussion

Our study makes several unique contributions to research on discussion forums. First, most of the previous studies looked at newsgroups or forums from only one country, the US in particular (e.g., Himelboim, 2008, 2011; Himelboim et al., 2009; Schneider, 1996). We went beyond case studies and collected discussion data from multiple countries, which to some degree keeps us away from making generalization from unique settings. Second, we filled a void in the literature by taking a macro perspective to investigate the relationships between communicative inequality and features of cultural tradition, value orientation, and political system. The difference across societies is at least as valuable as the difference within a single forum or country. Third, we differentiated attention equality from participation equality, both of which are crucial aspects of participation quality. We also argued for the need to distinguish between views and replies received by one post.

Conversation threads in a discussion forum do not receive the same amount of attention from its users. Adding onto evidence from prior studies, we showed that inequalities in discussion views and replies exist in all forums from a diverse collection of societies. Most of the discussion threads received a few replies and views and only a small proportion of them became popular. Above and beyond that, we also found the levels of inequalities vary significantly across forums. In other words, the severity of attention inequality is not equal, which leads to our interest in identifying the predictors of attention inequality.

Our analyses found communicative inequalities in online political discussion are indeed subject to cultural, social, and political influences. Discussion threads received relatively more equal treatment in individualistic and low power distance cultures. This goes consistent with the argument that people are less likely to follow the majority in individualistic and lower power

distance cultures. The finding also resonates with the argument that Internet communication should be viewed as a cultural practice and the impacts of Internet on politics largely depend on the way people use it in different culture traditions.

Our data also showed that self-expression and rational values were both positively associated with inequality in post view distribution. If self-expression and rational values are proxy measures of modernity (Inglehart, 2005), attention allocation is more unequal in modernized societies. Expressive individuals in modernized societies tend to voice their diverse opinions. A large amount of information leads to a selection process that favors the already popular posts, thus creating inequality.

Contrary to our expectation, we found that democracy has a negative influence on inequality in reply distribution, despite the fact that its close correlate, self-expression value is positively related to attention inequality. In democratic societies, inequality in reply distribution tends to be less severe than in non-democratic societies. We do not have enough empirical data for deciphering such a counter-intuitive finding but we do have one speculative explanation. When formulating our hypothesis, we only considered that democracy and expressive values lead to discussion content of larger quantity and higher diversity, which according to Himelboim's (2008) "size creates inequality" logic, attention inequality in democracies would be larger. Nevertheless, it is possible that the special civic culture attached to democracies has a "correction mechanism" that guide people's attention to less popular discussions. But unfortunately, we do not have a direct measure of such concept.

The empirical findings supported our argument that inequality in post view distribution and inequality in reply distribution are different, and it is necessarily to distinguish between the two. The discrepancy between two distributions presented in Figure 1 and Figure 2 attests to the

fact that reading a thread and replying to a thread are behaviors of different types: the inequality in reply distribution is more severe than the inequality in post view distribution. Also, two types of attention inequalities differ in their culture and political predictors.

Our study is not without limitations. First, only one forum was selected from each country. This is a compromise we made to include as many countries as possible in our sample. The popular forums from the 54 societies might not be representative of all discussion forums in the strictest sense. But, the ones included in our study do reflect the features of these countries. In particular, more than 40 percent of the variance in attention inequality was explained by the societal level predictors. If those forums we picked were not representative of these societies, it will be highly unlikely to detect such robust significant relationships with a sample size of 54. Second, we only look at political forums. Readers should be very careful when generalizing the findings to forums on other topics. It is possible that political discussion is highly influenced by the social and political environment of a particular country, but when it comes to topics such as fashion, health, or entertainment, the patterns of online discussion and interaction might differ. Third, the main focus of the current study is attention inequality. Admittedly, we ignored the detailed patterns of online discussion. Future studies could look into the how people interact with one another and explore why some posts became popular or ignored by users.

Forth, we differentiate participation equality from attention inequality but due to limitation of our data, we did not examine the relationship between the two concepts. Whether and how participation equality is associated with attention inequality is a valuable empirical question to ask and the answer to it might offer important normative implications for our understanding of political discussion online. If the increase of participation equality will lead to higher levels of attention inequality, a compromise between participation inequality and attention

inequality might have to be made based on the relative importance of the two concepts. Plus, attention inequality might not be inherently bad. It does not necessarily indicate conformity. A competing explanation could be that users are well-focused on the most important discussion topics. Finally, we examined online political discussion by focusing on only one technological platform among many others. Future research could test our model in other platforms, in particular social media such as Facebook, Twitter, and YouTube.

References

- Albrecht, S. (2006). Whose voice is heard in online deliberation?: A study of participation and representation in political debates on the internet. *Information, Communication & Society*, 9(1), 62-82. doi: 10.1080/13691180500519548
- Barabasi, A. L., & Albert, R. (1999). Emergence of scaling in random networks. *Science*, 286(5439), 509-512.
- Carpini, M. X. D., Cook, F. L., & Jacobs, L. R. (2004). Public deliberation, discursive participation, and citizen engagement: A review of the empirical literature. *Annual Review of Political Science*, 7, 315-344. doi: 10.1146/annurev.polisci.7.121003.091630
- Corrado, A., & Firestone, C. M. (Eds.). (1996). *Elections in cyberspace: Toward a new era in American politics*. Washington, DC: Aspen Institute.
- Graham, T. S. (2002). The Public Sphere Needs You. Deliberating in online forums: New hope for the public sphere? *The Amsterdam School of Communications Research*. Amsterdam, Universiteit van Amsterdam: 126.
- Dahlberg, L. (2001). The Internet and democratic discourse: Exploring the prospects of online deliberative forums extending the public sphere. *Information, Communication & Society*, 4(4), 615-633. doi: 10.1080/13691180110097030
- Dahlberg, L. (2004). Net-public Sphere Research: Beyond the "First Phase". *Javnost-the Public*, 11(1).
- Dahlgren, P. (2002). In search of the talkative public: Media, deliberative democracy and civic culture. *Javnost-the Public*, 9(3), 5-25.
- Davis, R. (1999). *The web of politics: The Internet's impact on the American political system*. New York: Oxford University Press.
- Dewey, J. (1954). *The public and its problems*. Columbus: Ohio University Press.

- DiMaggio, P., Hargittai, E., Neuman, W. R., & Robinson, J. P. (2001). Social implications of the Internet. *Annual Review of Sociology*, 27, 307-336. doi: 10.1146/annurev.soc.27.1.307
- Fisher, D., Smith, M., & Welser, H. T. (2006). *You are who you talk to: Detecting roles in Usenet newsgroups*. Paper presented at the the 39th Hawaii International Conference on System Sciences, Hawaii.
- Gordon, L. V. (1976). *Survey of interpersonal values, revised manual*. Chicago: Science Research Associates.
- Hacker, K. L., Howl, L., Scott, M., & Steiner, R. (1996). Uses of computer-mediated political communication in the 1992 presidential campaign: A content analysis of the Bush, Clinton and Perot computer lists. *Communication Research Reports*, 13, 138-146. doi: 10.1080/08824099609362080
- Hill, K. A., & Hughes, J. E. (1998). *Cyberpolitics: Citizen activism in the age of the Internet*. Lanham, MD: Rowman & Little.
- Himmelboim, I. (2008). Reply distribution in online discussions: A comparative network analysis of political and health newsgroups. *Journal of Computer-Mediated Communication*, 14(1), 156-177. doi: 10.1111/j.1083-6101.2008.01435.x
- Himmelboim, I. (2011). Civil Society and Online Political Discourse: The Network Structure of Unrestricted Discussions. *Communication Research*, 38(5), 634-659. doi: 10.1177/0093650210384853
- Himmelboim, I., Gleave, E., & Smith, M. (2009). Discussion catalysts in online political discussions: Content importers and conversation starters. *Journal of Computer-Mediated Communication*, 14(4), 771-789. doi: 10.1111/j.1083-6101.2009.01470.x
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organization across nations*. Thousand Oaks CA: Sage Publications.

- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). USA: McGraw-Hill
- Hwa-Froelich, D. A., & Vigil, D. C. (2004). Three aspects of cultural influence on communication: A literature review. *Communication Disorders Quarterly*, 25(3), 107-118. doi: 10.1177/15257401040250030201
- Inglehart, R., & Welzel, C. (2003). Political culture and democracy: Analyzing cross-level linkages. *Comparative Politics*, 36(1), 61-79. doi: 10.2307/4150160
- Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change and democracy*. New York: Cambridge University Press.
- Janssen, D., & Kies, R. (2005). Online forums and deliberative democracy. *Acta Politica*, 40(3), 317-335. doi: 10.1057/palgrave.ap.5500115
- Jensen, J. L. (2003). Public Spheres on the Internet: Anarchic or Government-Sponsored – A Comparison. *Scandinavian Political Studies*, 26(4), 349-374. doi: 10.1111/j.1467-9477.2003.00093.x
- Johansson, J. K. (1997). *Global Marketing*. New York, NY: MCGraw-Hill.
- Jones, S. G. (1997). The Internet and its social landscape. In S. G. Jones (Ed.), *Virtual culture: Identity and communication in cybersociety* (pp. 7-35). Thousand Oaks, CA: Sage.
- Kakabadse, A., Kakabadse, N. K., & Kouzmin, A. (2003). Reinventing the democratic governance project through information technology? A growing agenda for debate. *Public Administration Review*, 63(1), 44-60. doi: 10.1111/1540-6210.00263
- Kumar, K. (1993). Civil society: An inquiry into the usefulness of an historical term. *British Journal of Sociology*, 44(3), 375-395. doi: 10.2307/591808

- McCombs, M. E., & Zhu, J. H. (1995). Capacity, diversity and volatility of the public agenda: Trends from 1954 to 1994. *Public Opinion Quarterly*, 59 (4), 495-525.
- Mitra, A. (2001). Marginal voices in cyberspace. *New Media & Society*, 3(1), 29-48. doi: 10.1177/14614440122225976
- Muhlberger, P. (2004). Access, skill and motivation in online political discussions: Testing cyberrealism. In P. M. Shane (Ed.), *Democracy online: The prospects of political renewal through the Internet*. New York: Routledge.
- Mutz, D. C., & Young, L. (2011). Communication and Public Opinion. *Public Opinion Quarterly*, 75(5), 1018-1044. doi: 10.1093/Poq/Nfr052
- Noveck, B. S. (2003). Designing deliberative democracy in cyberspace: The role of the cyber-lawyer. *Boston University Journal of Science and Technology*, 9, 1-91.
- Nye, J. S., Jr. (2002). *The paradox of American power: Why the world's superpower can't go it alone*. Oxford, UK: Oxford University Press.
- Papacharissi, Z. (2002). The virtual sphere: The internet as a public sphere. *New Media & Society*, 4(1), 9-27. doi: 10.1177/14614440222226244
- Papacharissi, Z. (2004). Democracy online: Civility, politeness, and the democratic potential of online political discussion groups. *New Media & Society*, 6, 259-283. doi: 10.1177/1461444804041444
- Rheingold, H. (1993). *The virtual community: Homesteading on the electronic frontier*. Reading, MA: Addison-Wesley.
- Schneider, S. M. (1996). Creating a democratic public sphere through political discussion: A case study of abortion conversation on the Internet. *Social Science Computer Review*, 14(4), 373-393. doi: 10.1177/089443939601400401

- Seligman, A. B. (1992). *The idea of civil society*. Princeton, NJ: Princeton University Press.
- Suchman, L., Blomberg, J., Orr, J. E. & Trigg, R. (1999). Reconstructing technologies as social practice. *American Behavioral Scientist*, 43(3), 392 – 408. doi: 10.1177/00027649921955335
- Tan, B. C. Y., Wei, K. K., Watson, R. T., Clapper, D. L., & McLean, E. R. (1998). Computer-mediated communication and majority influence: Assessing the impact in an individualistic and a collectivistic culture. *Management Science*, 44(9), 1263-1278. doi: 10.1287/mnsc.44.9.1263
- Tan, Z., Mueller, M., & Foster, W. (1997). China's new Internet regulations: Two steps forward, one step back. *Communication of the ACM*, 40, 11-16. doi: 10.1145/265563.265565
- Wilhelm, A. G. (2000). *Democracy in the digital age: Challenges to political life in cyberspace*. London: Routledge.
- Williams, J. E., Satterwhite, R. C., & Saiz, J. L. (1998). *The importance of psychological traits: cross-cultural study*. New York: Plenum.
- Zhu, J. H. (1992). Issue competition and attention distraction: A zero-sum theory of agenda-setting. *Journalism Quarterly*, 69 (4), 825-836. doi: 10.1177/107769909206900403

Table 1. OLS Regression models predicting attention inequalities (robust standard error)

	Model 1		Model 2	
	View distribution inequality		Reply distribution inequality	
	Unstandardized	Standardized	Unstandardized	Standardized
Political institution				
Democracy	.011 (.008)	.259	-.012* (.006)	-.457
Value orientation				
Traditional-rational	.177** (.063)	.623	.006 (.038)	.032
Survival-self expression	.152* (.067)	.628	.040 (.039)	.260
Cultural tradition				
PDI	.004* (.001)	.343	.000 (.001)	.066
IDV	-.006* (.002)	-.570	.000 (.001)	.027
MAS	.004 (.003)	.204	-.002 (.002)	-.148
UAI	-.004* (.002)	-.366	.001 (.001)	.121
Control variable				
GDP per capital	-.035 (.036)	-.167	.021 (.016)	.160
Internet penetration	-.163 (.311)	-.154	-.210 (.126)	-.311
Number of threads	-.022 (0.33)	-.097	.026 (.017)	.183
View inequality			.605* (.248)	.515
Intercept	.097 (.513)		-.973** (.294)	
R ²	44.1%		47.7%	
N	40		40	

** . Significance at 0.01 level

* . Significance at 0.05 level

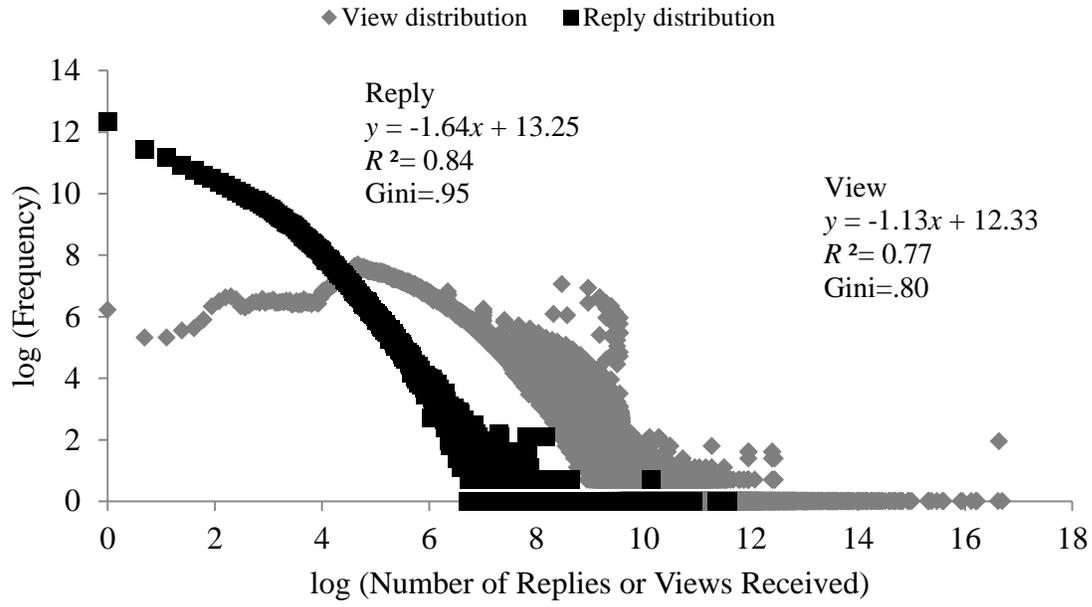


Figure 1. Frequency distributions of view and reply of all discussion threads

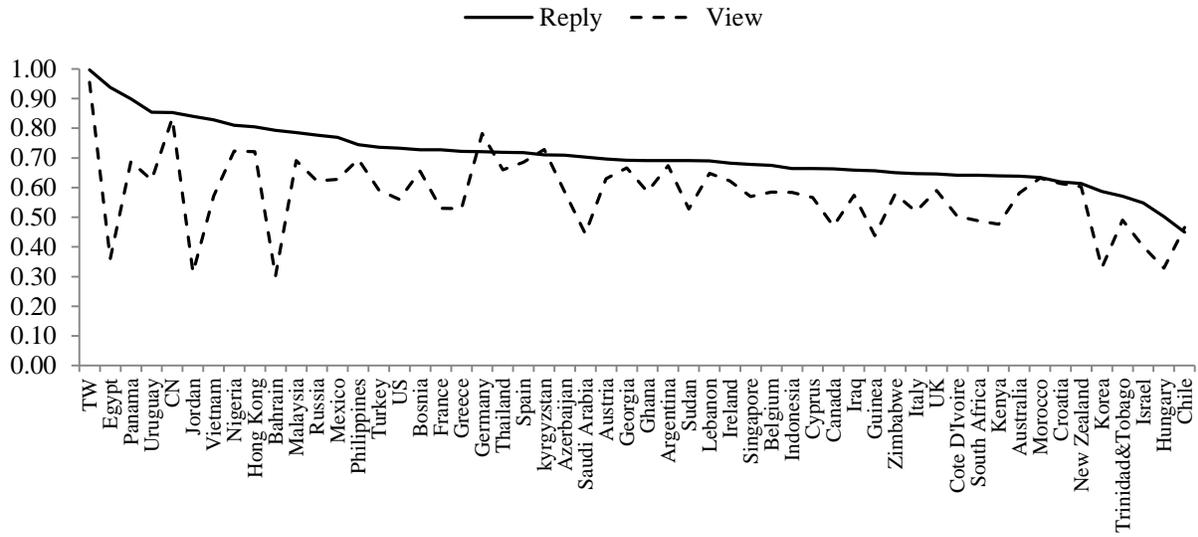


Figure 2. Gini coefficients of reply and view distributions in 54 societies

Footnotes

¹ <http://www.internetworldstats.com/list2.htm>

² <http://geert-hofstede.com/index.php>

³ http://www.worldvaluessurvey.org/wvs/articles/folder_published/article_base_54

⁴ <http://www.freedomhouse.org/report-types/freedom-world>

⁵ http://www.eiu.com/public/thankyou_download.aspx?activity=download&campaignid=DemocracyIndex2011

⁶ The “Polity IV Project: Political Regime Characteristics and Transitions, 1800-2010” was sponsored by the Political Instability Task Force, which is funded by the Central Intelligence Agency of the US Government.

⁷ <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

⁸ <http://www.internetworldstats.com/stats.htm>