

ORIGINAL ARTICLE

Network Agenda Setting, Partisan Selective Exposure, and Opinion Repertoire: The Effects of Pro- and Counter-Attitudinal Media in Hong Kong

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Using data from a content analysis of partisan media and a public opinion survey administered in Hong Kong, this study incorporates selective exposure and deliberation literature into the network agenda-setting (NAS) model to test media effects on people's perception of the relationship between Hong Kong and mainland China. This study advances the NAS literature by examining the effects of different media types (i.e., pro- and counter-attitudinal media), considering the patterns of media consumption (i.e., engagement in selective exposure or not), and differentiating between the NAS effects on one's own opinion repertoire and the oppositional opinion repertoire (i.e., thoughts about how oppositional others perceive the issue). The findings of the study demonstrate that the network agenda of pro-attitudinal media was significantly correlated with both one's own and oppositional opinion repertoires for those who engaged in partisan selective exposure. For those who did not engage in partisan selective exposure, the network agenda of counter-attitudinal media was significantly related to the oppositional opinion repertoire and the findings for one's own opinion repertoire were mixed.

Keywords: Network Agenda Setting, Selective Exposure, Partisan Media, Opinion Repertoire

doi:10.1093/joc/jqz042

Communication scholars have strived to understand the effect of news media on individuals' cognitive processes. Agenda setting remains a predominant theoretical approach used to analyze the impact of media messages on audiences (Graber & Smith, 2005). The theory suggests a transfer of the salience of objects (e.g., issues; first-level agenda setting) and attributes that describe a certain object (second-

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level agenda setting) from news media to the public (McCombs, 2004). One recent development in agenda-setting theory, the network agenda-setting (NAS) model, asserts that the salience of network relationships between objects and attributes can also be transferred from the media to the public agenda (Guo, 2012). This is considered the third level of agenda setting, which emphasizes the effect of the overall picture of the news coverage rather than the prominence of individual elements. Although the NAS model has received empirical support (e.g., Guo & McCombs, 2011; Vu, Guo, & McCombs, 2014), researchers have not paid enough attention to the nuances of the public's network agenda. In particular, it remains unknown to what extent the public's network agenda would be affected by news media with different political orientations, which can be considered pro- or counter-attitudinal to a citizen in terms of his or her political leaning. In this study, we incorporate the literature on deliberation and partisan selective exposure into the NAS model to understand the nuances of the public network agenda and how they relate to the network agenda of pro- and counter-attitudinal media.

Deliberation refers to “a combination of careful problem analysis and an egalitarian process in which participants have adequate speaking opportunities and engage in attentive listening or dialogue that bridges divergent ways of speaking and knowing” (Burkhalter, Gastil, & Kelshaw, 2002, p. 398). Theorists hold that such deliberation, with disagreement as one of the core elements, plays an important role in fostering an understanding of different political views, producing well-informed opinions, and generating balanced political judgments (Gutmann & Thompson, 1996; Mutz, 2002; Price, Cappella, & Nir, 2002). Most research concerned with deliberation pertains to interpersonal conversation, but researchers suggest that news media can also facilitate the deliberative process by offering diverse issue information and divergent political positions (Wessler & Rinke, 2014).

However, news media might not adequately perform their role as crucial sources of political information, but instead deliver slanted information catering to their target audience's political preferences (Iyengar & Hahn, 2009; Chen, Gan & Sun 2017). Partisan media outlets have been found to cover issues differently and lead partisans to view the political world differently, depending on their political leaning (Stroud, 2011). One important goal of this study is to investigate the NAS effect of partisan media. The deliberation literature, therefore, offers this study a framework to probe how media could make people perceive an issue in different ways by shaping their cognitive maps. It is worth noting that this study did not test the classic deliberation dynamics, such as political discussion, debates, and opinion exchanges. Instead, we examine how partisan media affects people's cognitive process by distinguishing between one's own opinion repertoire and that of a group of “oppositional others” who hold an oppositional political perspective (e.g., left-leaning vs. right-leaning in the United States). The deliberation literature serves as a framework and foundation for a normative discussion, given that this study aims to integrate it with the NAS model, which typically assesses the formation of mental maps. It is likely that partisan media shape not only how we think of an issue, but also how we perceive the

way oppositional others think of the issue. Examining these two types of opinion repertoire is particularly helpful for researchers to understand the effects of media on the development of deliberative democracy.

The aforementioned agenda-setting effects of partisan media are posited based on the assumption that partisans are exposed to pro-attitudinal content. However, the role of selective exposure has not yet been fully explored in the agenda-setting research. Although people who engage in partisan selective exposure are likely to see the world in partisan terms (Stroud, 2011), some people may not engage in this selective behavior (Dubois & Blank, 2018). In this study, we look specifically at how the NAS effect might vary on individuals who engage in partisan selective exposure and on those who do not, shedding light on the variances of media effects in the agenda-setting research. Taken together, we examine the extent to which pro- and counter-attitudinal media affect one's own opinion repertoire and that of oppositional others, while considering whether individuals engage in partisan selective exposure or not.

This study is based on a network analysis of media coverage and public opinion in Hong Kong, which features a rich variety of media sources and a semi-democratic political system where citizens have no vote for the Chief Executive and only half of the legislature is elected through a popular vote (Lee & Chan, 2012). Setting the study in Hong Kong extends the literature on NAS to a non-Western context and a different political system, given that most of the empirical evidence supporting the NAS model has been gathered in the United States (e.g., Vargo, Guo, McCombs, & Shaw, 2014), with only a few exceptions (e.g., Cheng, 2016; Cheng & Chan, 2015; Wu & Guo, 2017). Specifically, we focused on the Hong Kong–mainland China relationship, which has become a significant issue polarizing public opinion in Hong Kong.

The Hong Kong context: The Hong Kong and mainland China relationship

The handover of sovereignty over Hong Kong set off a drastic transition and a series of political upheavals in the past two decades. Recent polls show a growing concern about China's political interventions in Hong Kong (Public Opinion Programme, 2019). These include controversies over political reform, the political screening of election candidates, moral and national education, the implementation of universal suffrage (which provoked several large-scale protests, such as the Umbrella Movement), and a proposed extradition bill that would allow people to be sent from Hong Kong to mainland China for trial.

The conflicts between Hong Kong and mainland China have stimulated constant debates in the news media and the public, where voices from different political camps are presented. Hong Kong is not a two-party system, but the political parties can be generally classified into the pro-establishment and the pro-democracy camps, which represent the two major political forces that have opposite political stances on most issues. The pro-establishment camp takes a political orientation that caters to the interests of the central Chinese government, and the Hong Kong government

and officials typically align themselves with the pro-establishment camp. The pro-democracy camp promotes the democratization of Hong Kong and seeks a greater level of autonomy from the Chinese government. In addition to news media that hold a neutral political stance, a large number of partisan media exist that support either pro-establishment or pro-democracy political ideologies.

Scholars, critics, and the press have indicated that public opinion in Hong Kong has been increasingly polarized (e.g., Wu & Shen, 2018). The proliferating media outlets, the controversial issue of the Hong Kong–mainland China relationship, and the tension between the pro-democracy camp and the pro-establishment camp provide a suitable context to examine the NAS effect and partisan selective exposure.

The network agenda-setting model

The transfer of salience of objects from the news media agenda to the public agenda is known as first-level agenda setting (McCombs & Shaw, 1972). Given that each object emphasized by the media has numerous characteristics and properties, second-level agenda setting examines the salience transfer of attributes. While the first two levels of agenda-setting research focus on individual, discrete elements, the NAS model proposes that the salience of interrelationships between objects and/or attributes can also be transferred from the news media to the public's mind (Guo, 2012). Specifically, the NAS model incorporates concepts of cognitive mapping and the associative network model, suggesting that humans' mental representations can be presented as a network-like structure in which any node (the unit of information) is connected to numerous other nodes (Anderson, 1983). One can search one's associative memory network for specific information and reactivate it in the working memory. Among other factors, media coverage plays a significant role in shaping the associative memory network. By activating and reactivating certain information, the media can create and strengthen the connection between constructs in the audience's memory. For instance, if news media report two issues recurrently (e.g., economy and immigration), the audience will be likely to retrieve the connection between the two issues. Thus, news media can influence our cognitive perception not only by telling us what to think about and how to think about it, but also how to associate different messages (Guo, 2012, p. 621).

A number of empirical studies have provided support for the NAS model (see Guo & McCombs, 2015). For example, based on an analysis of the Texas gubernatorial election in 2002, the first NAS study found that the interrelationships among the political candidates' attributes emphasized by news media had a significant correlation with the public's perception of the candidates (Guo & McCombs, 2011). Another study tested the NAS model by examining an object-based network derived from sets of national data from a 5-year period in the United States (Vu et al., 2014). The study focused on objects rather than attributes, documenting that news media bundled issue objects and made the interrelationships salient in the public's mind. Using large datasets from Twitter, Vargo et al. (2014) further validated the NAS model

in the social media context during the 2012 U.S. presidential election. Outside the U.S. context, the NAS model has been applied to Hong Kong in two studies. Cheng and Chan (2015) investigated the NAS effect in the setting of the anti-Moral and National Education movement in Hong Kong and found a strong correlation between the media and public attribute network agendas. Cheng (2016) also found a strong attribute agenda-setting effect at the third level in a study on a controversial political figure in Hong Kong.

To theoretically advance the NAS model, the current study draws on the deliberation and selective exposure literature to distinguish between one's own and oppositional opinion repertoires and examine the NAS effects of pro- and counter-attitudinal media while considering individuals' media consumption patterns. We assume that the pro- and counter-attitudinal news media would be powerful in shaping one's own network agenda, as well as one's perception of the opposing camp, depending on how people consume the media.

Distinguishing between one's own and oppositional opinion repertoires

Deliberation is tied to democratic politics and the public sphere in which rational political decision-making occurs through the process of political thinking and discussion among equal citizens to achieve political goals and the public good (Gutmann & Thompson, 1996). Deliberation highlights equality as one of its normative characteristics so that the discourse of certain viewpoints should not be lacking or otherwise suppressed (Sanders, 1997). Thus, to capture the outcome of deliberation, scholars have examined the quality of public opinion by using the measure of argument repertoire as an indicator of the development of a deliberative society that values diverse ideas and views (Cappella, Price, & Nir, 2002).

The concept of an argument repertoire suggests that for any given stated opinion on an issue, there should be relevant reasons both for and against it (Cappella et al., 2002). As a result, the measure of an argument repertoire not only considers one's understanding of his or her own viewpoint (i.e., one's own argument repertoire), but also takes empirical account of the person's understanding of the opposite position (i.e., the oppositional argument repertoire). For example, if some respondents indicate that their position is pro-life on the abortion issue, they will be asked to list reasons why they support the pro-life view and are against the pro-choice view, as well as reasons why oppositional others support a pro-choice view and are against the pro-life view. Studies have found that one's own and the oppositional argument repertoires can be affected differently by exposure to pro- and counter-attitudinal viewpoints (Chen, 2018; Wojcieszak, 2012).

Following the same line of reasoning, to assess the cognitive process in the NAS effect, it is important to probe into the complexity of public opinion by understanding not only how one thinks of an issue, but also how one perceives the way oppositional others think of the issue. We use the term "opinion repertoire"—one's own and the oppositional others'—given that it has some similarity to argument repertoire

in terms of differentiating conceptually between one's own and the oppositional others' stance. It is, however, worth noting that the deliberation literature only offers a framework leading us to examine the two types of opinion repertoires, given that our focus is to capture people's perception of an issue (e.g., perceived attribute network of an object), which is the key outcome variable in the NAS research. The opinion repertoire is different from the traditional measures of deliberation, such as argumentation, political debates, and interpersonal discussion.

Doing so fills a gap in the NAS research in particular, as well as in the agenda-setting research in general, which has long examined how news media influence how people think of an issue from one's own perspective. The literature has not yet developed an understanding of the other potential dimension of the cognitive process, which is an individual's perception of how oppositional others think of the issue. Specifically, to investigate the NAS effect, we distinguish between one's own attribute network and that of the oppositional others and examine how the two types of network are associated with pro- and counter-attitudinal media, respectively. In addition, we expect that the NAS effect should depend on one's media consumption patterns, which can be examined through the theoretical lens of selective exposure.

Selective exposure and network agenda setting

Selective exposure denotes the influence of individuals' media selections and has been considered an explanation for why media cannot influence individuals' beliefs or perceptions effectively (Klapper, 1960). The main question in selective exposure research is to understand whether individuals actively seek out likeminded information and avoid information that challenges their beliefs (Festinger, 1957). Researchers have applied selective exposure to understand partisans' preference for consonant political information that can reinforce their pre-existing political views (Garrett, 2009; Stroud, 2011). Deliberative theorists have been concerned that individuals' tendency to seek likeminded information is detrimental to democratic development (e.g., Habermas, 1989). When they consume predominantly likeminded information and do not hear viewpoints from other sides, citizens will be less politically tolerant and more attitudinally polarized (Sunstein, 2007; Kim, 2015). It would also be detrimental to the understanding of a subject (Benhabib, 1996).

Researchers have incorporated the examination of selective exposure in agenda-setting research (e.g., Stroud, 2011) and argued that different media outlets with their own political leanings would have different agendas in their reporting. Individuals who tend to selectively expose themselves to likeminded opinions and consonant information would be especially susceptible to pro-attitudinal media (Barnidge et al., 2020; Stroud, 2011). In other words, partisan media, which tend to be regarded as trusted sources among likeminded audiences, are in a privileged position to set the agenda of those who are engaged in partisan selective exposure. Wu and Guo (2017) documented this pattern in their NAS study about the 2012 Taiwan presidential election. Assuming that partisan voters would mainly consume pro-

attitudinal media, they found a significant relationship between the issue network of partisan media and that of their likeminded voters.

To establish a baseline, this present study first sought to replicate [Wu and Guo's \(2017\)](#) findings, and expects that in the context of Hong Kong, pro-establishment and pro-democracy supporters' attribute networks that represent their own opinion repertoire should match the attribute networks of the pro-attitudinal media they consume regarding the issue of the relationship between Hong Kong and mainland China. We propose the following:

H1: The attribute network of the pro-establishment media is positively associated with the attribute network that represents pro-establishment supporters' own opinion repertoire.

H2: The attribute network of the pro-democracy media is positively associated with the attribute network that represents pro-democracy supporters' own opinion repertoire.

The relationship discussed above between agenda setting and selective exposure is built on the assumption that the public is engaged in selective exposure. However, this may not hold true in reality. For instance, [Dubois and Blank \(2018\)](#) argued that only a small segment of the population in the United Kingdom are likely to find themselves in an echo chamber. There is also the question of what should be counted as selective exposure. In many studies, selective exposure has been conceptualized as a behavior that combines both approaching likeminded and avoiding counter-attitudinal information, an all-or-nothing phenomenon ([Festinger, 1957](#); [Klapper, 1960](#)). This operationalization assumes that people either exclusively use likeminded information and are considered to engage in selective exposure or they do not engage in selective exposure. However, exposure to only likeminded views is almost impossible in a high-choice media environment ([Prior, 2007](#)). People would be exposed to conflicting viewpoints to some extent, either purposefully or incidentally ([Garrett & Stroud, 2014](#); [Kim, Chen, & Gil de Zúñiga, 2013](#)). Accordingly, to examine partisan selective exposure, a preference for likeminded viewpoints over other viewpoints (i.e., counter-attitudinal and neutral) is a more compelling conceptualization ([Stroud, 2017](#)). While scholars over the years have strived to develop a comprehensive measure of selective exposure, following this straightforward conceptualization would be practical to capture engagement in selective exposure in the current media environment.

In this study, we examine whether a person engages in partisan selective exposure or not, and how that would influence the NAS effect. As for one's own opinion repertoire, it is logical to assume that pro-attitudinal media should have a NAS effect on those who exhibit a pattern of partisan selective exposure. Thus, we propose:

H3: The attribute network of pro-attitudinal media is positively associated with the attribute network that represents one's own opinion repertoire among those who engage in partisan selective exposure.

Partisan selective exposure may also influence one's understanding of the perspectives of oppositional others. The way outgroup members are portrayed in the partisan media is believed to have consequences for levels of prejudice and stereotyping in the mass public (Mutz & Goldman, 2010). Given that people lack familiarity with members of the outgroup (Linville & Jones, 1980), they are likely to retrieve information about outgroup members from the media. People who engage in selective exposure would retrieve more information about the outgroup from pro-attitudinal media. Thus, pro-attitudinal media could induce biased processing and lead audiences to misunderstand others by affecting how individuals think of the oppositional others. Accordingly, we posit:

H4: The attribute network of pro-attitudinal media is positively associated with the attribute network that represents the oppositional opinion repertoire among those who engage in partisan selective exposure.

The network agenda-setting effect of counter-attitudinal media

Given that people are likely to be exposed to at least some counter-attitudinal information in a high-choice media environment, what has been lacking in the NAS literature, to our knowledge, is the study of the NAS effect, or the agenda-setting effect in general, of counter-attitudinal media. In particular, the NAS effect of counter-attitudinal media on individuals who consume both pro- and counter-attitudinal media is important but unexplored. As deliberative theorists argue, exposure to counter-attitudinal perspectives promotes representative thinking (Gutmann & Thompson, 1996). It enhances the awareness of rationales that support opposing perspectives and also familiarizes people with oppositional arguments (Mutz, 2002). As a result, one can better understand a political issue, think with more complexity about one's own beliefs, and be more likely to use nonredundant attributes when thinking about a political issue (Gastil & Dillard, 1999). In addition to prompting cognitive reasoning about an issue, counter-attitudinal exposure facilitates political tolerance, a more balanced political judgment, and a more moderate attitude toward an issue (Gutmann & Thompson, 1996). Thus, exposure to counter-attitudinal viewpoints assists the formation of reasoned public opinion, which is essential to deliberative democracy (Habermas, 1989). In line with the previous literature, we hypothesize that for those who do not exercise partisan selective exposure, their thoughts about oppositional others' opinions should match the counter-attitudinal media:

H5: The attribute network of counter-attitudinal media is positively associated with the attribute network that represents the oppositional opinion repertoire among those who do not engage in partisan selective exposure.

For people who are exposed to varied perspectives, it is unclear whether counter-attitudinal media would also affect their own opinion repertoire. Therefore, we propose a research question:

RQ1: What is the relationship between the attribute network of counter-attitudinal media and the attribute network that represents one's own opinion repertoire among those who do not engage in partisan selective exposure?

Method

We collected two original datasets to examine the NAS effects: (1) a content analysis of media coverage about the Hong Kong–mainland China relationship during the time period of the 19th National Congress of the Communist Party of China (NCCPC; from 18 October to 16 November 2017);¹ and (2) a public opinion survey of Hong Kong citizens about their thoughts on the Hong Kong–mainland China relationship, administered after the 19th NCCPC from 20 November to 7 December 2017 ($n = 1,014$). A network analysis was conducted to explore the correspondence between the network agendas of different types of media and citizens who held varied political views.

Content analysis

This study focused on the analysis of local news media in Hong Kong. It includes 30 media outlets from the news brand list in the Digital News Report survey (Reuters Institute for the Study of Journalism, 2017; see Supporting Information Appendix A). The ideological tendency of each media outlet (pro-establishment, pro-democracy, and neutral) was determined based on previous studies in Hong Kong (e.g., Lee, 2018). WiseNews and Crimson Hexagon were the two databases used to retrieve relevant news articles. We first searched on WiseNews for the relevant articles and then used Crimson Hexagon to check the searched results and collect news articles that were not covered in WiseNews to ensure the articles we collected are comprehensive.

We created an initial list of keywords to search for news articles about the Hong Kong–mainland China relationship and then conducted several rounds of testing to refine the keywords to improve the precision and recall of the searched results. We present the keywords in Supporting Information Appendix B (Lacy, Watson, Riffe, & Lovejoy, 2015). The final database included 6,970 Chinese-language articles and 1,168 English-language articles. For the manual content analysis, a stratified random sample of news articles was drawn. Specifically, one-fourth of the news articles were randomly sampled from each media outlet, yielding a final sample of 2,035 articles. In the media sample, 20.5% of the news stories were from pro-democracy media, 21.5% were from neutral media, and 58.0% were from pro-establishment media; the unbalanced data reflect the current Hong Kong media market, in which most news media outlets have been gradually affected by the Chinese authorities since the 1997 handover (Frisch, Belair-Gagnon, & Agur, 2018).

The key variable for the content analysis is the attribute mentioned in the news story to describe the object of this analysis: the issue of the Hong Kong–mainland

China relationship. Here, we considered sub-topic as an attribute: that is, how the news media mentioned different sub-topics to talk about the Hong Kong–mainland China relationship. Based on the literature review of agenda-setting research and a preliminary analysis of the data, a total of 16 sub-topics were included in the analysis: economy, education, history, human rights, infrastructure, law, Hong Kong politics, mainland politics, housing, social welfare, technology, culture/self-identity, democracy, Hong Kong independence, population mobility, and social movement. An operational definition for each sub-topic was developed to explain how it serves as an attribute to describe the Hong Kong–mainland China relationship. For instance, the sub-topic of economy refers to the actual or potential economic benefits or challenges in Hong Kong that are brought by the Hong Kong–mainland China relationship. The sub-topics are mutually exclusive to each other in definition.

Three graduate students were trained to analyze the data. For each article, they first determined whether the news story is mainly about the Hong Kong–mainland China relationship or not, based on the title and entire article. Only relevant articles were included in the analysis. Then, the coders were instructed to decide whether a sub-topic was mentioned or not after reading through the title and entire article. An inter-coder reliability test based on 10% of the sampled stories was conducted, reaching .98 for determining the article to be relevant and an average of .98 for determining sub-topics based on Krippendorff's α measure (see Supporting Information Appendix C).

Public opinion survey

The online survey was conducted by Survey Sampling International, a Web survey panel company. To proportionally represent the Hong Kong population, Survey Sampling International employed a stratified quota sampling based on gender, age, education, and income so that the sample would match the Hong Kong census. After finalizing the sample matching procedure, 1,014 participants completed the survey. The final sample was 55.2% female, with a mean age group of 40–44 years old ($M = 5.64$, $SD = .50$), “vocational degree” as their average level of education ($M = 6.04$, $SD = 1.62$), and HK\$30,000–39,999 (equivalent to US \$3,800–5,100) as the average household income per month. Stratified quota sampling was found to be a practical way to collect representative samples and quality responses, and it has been a popular method in communication research (Ansolabehere & Schaffner, 2014; Iyengar & Hahn, 2009).

Survey measures

Partisanship

Respondents were asked to indicate to which political party they were more inclined (Chan, Lee, & Chen, 2016). The results showed that 55.3% of respondents were pro-democratic, 25.2% were politically neutral, and 19.5% were pro-establishment. Given that the study focused on the partisan communities in Hong Kong, the politically

neutral group was not included for the subsequent data analyses.² The survey sample was, therefore, reduced to 759 respondents: 198 pro-establishment supporters and 561 pro-democracy supporters.

Indices of media consumption

Before capturing individuals' partisan selective exposure, their media consumption was first measured. Adopting the measure from [Garrett et al. \(2014\)](#), we asked the respondents to indicate whether they used each media outlet listed in Supporting Information Appendix A and, if so, the frequency of consumption on a 6-point Likert scale (1 = very few; 4 = three to four times a week; 6 = every day). For each respondent, three indices of media consumption were created by summing the use frequency of each group of media: pro-democracy media consumption ($M = 8.32$, $SD = 7.82$), pro-establishment media consumption ($M = 16.94$, $SD = 12.96$), and neutral media consumption ($M = 10.72$, $SD = 11.54$). Rather than simply asking the extent to which respondents consume partisan media in general, our way of measurement counts each specific media outlet, which helps to create a more valid index of selective exposure.

Index of partisan selective exposure

We first compared respondents' media consumption with their partisanship to measure the extent to which they were exposed to pro-attitudinal, counter-attitudinal, and neutral media ([Barnidge et al., 2020](#)). For example, if a respondent was a pro-democracy supporter, his or her pro-attitudinal media exposure was calculated by dividing the pro-democracy media consumption by the total media consumption. For the same respondent, counter-attitudinal media exposure was calculated by dividing his or her pro-establishment media consumption by the total media consumption. Neutral media exposure was calculated in the same way. The media exposure scores for all camps were normalized before the calculation. Thus, each respondent had three ratio scores: pro-attitudinal media exposure ($M = .39$, $SD = .25$), counter-attitudinal media exposure ($M = .35$, $SD = .25$), and neutral media exposure ($M = .26$, $SD = .21$).

Second, the ratio scores were then recoded to identify those who exercised selective exposure and those who did not. Again, we operationalized selective exposure as a preference for consuming news from pro-attitudinal media over that from other sources (i.e., counter-attitudinal and neutral media; [Stroud, 2017](#)). Specifically, if one's pro-attitudinal media exposure ratio score was greater than 0.50, indicating that the respondent consumed more than 50% of pro-attitudinal media content in his or her overall media diet, then it was recoded as 1, representing engagement in partisan selective exposure; otherwise, it was recoded as 0. Thus, all respondents were categorized into one of two groups: the selective exposure group ($n = 243$) or non-selective exposure group ($n = 516$). We decided to set the cut-off at 50% due to our theoretical conceptualization discussed above, and also in light of the sample size.

Further distinguishing between different selective exposure levels and types would reduce the sample size in each group, which would make the attribute networks too sparse to conduct statistical tests, as described below.

Opinion repertoire

To understand how people think about the Hong Kong–mainland China relationship, we developed an innovative approach to explore the respondents' opinion repertoire, which is unique in two aspects. First, following the logic of argument repertoire, we captured not only how one thinks of the issue (i.e., one's own opinion repertoire), but also how one perceives the way oppositional others think of the issue (i.e., oppositional opinion repertoire). Specifically, respondents in our online survey were first asked to come up with and enter up to five sub-topics related to the Hong Kong–mainland China relationship. Then, they were asked to enter up to five sub-topics the oppositional others would come up with about the issue. For example, pro-establishment supporters were asked to list up to five sub-topics they thought pro-democracy supporters would enter.

Second, our approach measured explicit association in an online context. Most of the previous NAS studies examined implicit associations between objects or attributes, based on their co-occurrences in the survey responses. In [Wu and Guo's \(2017\)](#) study, for example, if a survey respondent mentioned two issues that were important to Taiwan, the researchers would assume the two issues have a connection in that respondent's mind. A mind-mapping method to measure explicit object or attribute associations, meaning that respondents directly indicated the association between the objects or attributes, has not been applied in the context of an online survey. We sought to address that limitation in this study. Accordingly, for each pair of sub-topics entered, we instructed the respondents to indicate the strength of the association from 0 to 100, with 0 meaning no association at all and 100 meaning an extremely strong association. By having respondents make connections between sub-topics themselves and indicate the strengths of the connections, we were able to measure the public's attribute networks in a more explicit and valid manner than previous NAS research that relied on online surveys. In line with the analysis of news coverage, the survey responses were manually coded into the 16 predetermined sub-topics. The inter-coder reliability test, based on 10% of the survey responses, yielded an average α of 0.81, ranging from 0.71 to 1.

Network analysis

We followed the procedure used in previous research to examine NAS effects (e.g., [Guo, 2012](#)). Data from the content analyses of news stories and the survey data were transferred to matrices for conducting network analysis.

The multiple regression quadratic assignment procedure (MRQAP) was used to statistically test the hypotheses and research questions using RStudio (package

asnipe). MRQAP is the extension of the quadratic assignment procedure (QAP) with the double semi-partialling permutation method (Dekker, Krackhardt, & Snijders, 2007). MRQAP can assess the unique effect of one independent matrix on the dependent matrix by partialling out the effects of other predictors. This approach randomizes the residuals from the regression on each predictor (fixed effect) to obtain the p -value.

Media agenda networks

The matrices of each media outlet were constructed to reflect the associations between the 16 sub-topics. The weight between each pair of sub-topics was calculated based on the frequency of the two sub-topics' co-occurrence in the same article. That is, each media matrix contained 16 rows and 16 columns, with the entry in each cell representing the degree of association between the two corresponding sub-topics. The more frequently the two sub-topics co-occurred across news articles, the stronger their connection.³

Public agenda networks

The matrices for the public's attribute networks were constructed to reflect the strengths of association between the 16 sub-topics indicated by the respondents. As explained earlier, each respondent indicated whether he or she thought any two sub-topics were related and, if so, assigned a value to indicate the degree of association between the two sub-topics (0 to 100). The distribution of each pair of sub-topics' association values reported by the respondents is nearly normal. Based on their self-reported data, the public is classified into pro-democracy and pro-establishment supporters and into selective and non-selective exposure groups. For each pair of sub-topics, the values indicated by all respondents within each group were added up to represent the overall strength of association between the two sub-topics in the respective public attribute network. In addition, for each group, two matrices of attribute networks were constructed to reflect one's own opinion repertoire and that of oppositional others. In total, 8 matrices ($2 \times 2 \times 2$) were constructed.

Data analysis

Matrices of the two partisan media groups were simultaneously entered into a MRQAP regression model (a matrix of neutral media was also included in the model as a control to partial out the confounding effect) to assess the unique effect of each independent variable. For example, in order to test H1, we examined the effect of pro-establishment media on pro-establishment supporters while controlling for the effect of counter-attitudinal media: in this case, pro-democracy media. We also controlled for the effect of neutral media in the models.

Results

Overall, the results show the presence of the NAS effect in the Hong Kong context. Specifically, the effects varied by pro-attitudinal and counter-attitudinal media, and by partisan Hongkongers, with or without engaging in partisan selective exposure.

In examining H1 and H2, the results showed that the attribute networks of Hongkongers were significantly associated with pro-attitudinal media (see Table 1, Model 1a and 1b, about all respondents). The attribute network of pro-establishment Hongkongers was positively and significantly correlated to the pro-establishment media ($\beta = .29, p < .05$), which explained 22% of the variance. Similarly, the attribute network of pro-democracy Hongkongers was positively correlated with the pro-democracy media ($\beta = .17, p < .05$) and explained 21% of the variance. H1 and H2 were both supported (see Supporting Information Appendix D for a network visualization).

We now consider the role of partisan selective exposure in the NAS relationship. Tables 1 and 2 present the results, in which pro-establishment and pro-democracy supporters are further separated into those who engaged and those who did not engage in partisan selective exposure. Table 1 demonstrates the NAS effect of different media on respondents' own opinion repertoire and Table 2 illustrates the NAS effect on the oppositional opinion repertoire.

H3 proposed the NAS effect on Hongkongers who engaged in partisan selective exposure. The results in Table 1, Models 2a and 2b, showed that, for both pro-establishment and pro-democracy supporters, the attribute network that represented their own opinion repertoire was positively associated with the corresponding attribute network of pro-attitudinal media (Model 2a: $\beta = .31, p < .05$; Model 2b: $\beta = .46, p < .05$). In addition, for those who engaged in partisan selective exposure, the attribute networks were not correlated with the networks of the counter-attitudinal media. Therefore, H3 was supported. Supporting Information Appendix E illustrates the effects of partisan media agenda networks on the attribute networks of opinion repertoire.

H4 investigated whether partisan selective exposure could also influence the NAS effect on the oppositional opinion repertoire. As shown in Table 2, Model 1a, for pro-establishment supporters who engaged in partisan selective exposure, the attribute network of the pro-establishment media was positively associated with their attribute network of the oppositional opinion repertoire ($\beta = .14, p < .05$). A similar effect was also found for pro-democracy supporters who engaged in partisan selective exposure: the attribute network of the pro-democracy media was positively associated with their attribute network of the oppositional opinion repertoire (Model 1b: $\beta = .25, p < .05$). Thus, the findings suggest a significant relationship between the attribute network of pro-attitudinal media and the attribute network of the oppositional opinion repertoire among those who engage in partisan selective exposure, regardless of their political orientation, supporting H4.

Table 1 Results of Multiple Regression Quadratic Assignment Procedure Analysis on the Attribute Network of One's Own Opinion Repertoire

Attribute Networks of Partisan Supporters	Attribute Networks of Partisan Media	B	β	Adjusted R ²
All respondents				
Model 1a, pro-establishment supporters, <i>n</i> = 198	Pro-establishment media	7.20*	.29*	.22***
	Pro-democracy media	3.51	.24	—
	Neutral media	28.49**	.94**	—
Model 1b, pro-democracy supporters, <i>n</i> = 561	Pro-establishment media	7.15	.09	.21***
	Pro-democracy media	8.75*	.17*	—
	Neutral media	71.68*	.70*	—
Selective exposure group				
Model 2a, pro-establishment supporters, <i>n</i> = 146	Pro-establishment media	7.10*	.31*	.19**
	Pro-democracy media	1.45	.16	—
	Neutral media	19.94**	.86**	—
Model 2b, pro-democracy supporters, <i>n</i> = 97	Pro-establishment media	2.66	.14	.20**
	Pro-democracy media	3.71*	.46*	—
	Neutral media	19.29**	.96**	—
Non-selective exposure group				
Model 3a, pro-establishment supporters, <i>n</i> = 52	Pro-establishment media	-2.07*	-.54*	.19**
	Pro-democracy media	.10	.01	—
	Neutral media	8.55**	.89**	—
Model 3b, pro-democracy supporters, <i>n</i> = 464	Pro-establishment media	6.09*	.20*	.20**
	Pro-democracy media	-3.44	-.10	—
	Neutral media	52.39*	.61*	—

Note: The attribute network of the neutral media is included as a control. **p* < .05; ***p* < .01; ****p* < .001.

Table 2 Results of Multiple Regression Quadratic Assignment Procedure Analysis on the Attribute Network of the Oppositional Opinion Repertoire

Attribute Networks of Partisan Supporters	Attribute Networks of Partisan Media	B	β	Adjusted R^2
Selective exposure group				
Model 1a, pro-establishment supporters, $n = 146$	Pro-establishment media	1.63*	.14*	.17**
	Pro-democracy media	-.91	-.08	—
	Neutral media	4.03*	.37*	—
Model 1b, pro-democracy supporters, $n = 97$	Pro-establishment media	.04	.02	.25***
	Pro-democracy media	1.54*	.25*	—
	Neutral media	3.05*	.48*	—
Non-selective exposure group				
Model 2a, pro-establishment supporters, $n = 52$	Pro-establishment media	-.69*	-.37*	.11*
	Pro-democracy media	2.82*	.61*	—
	Neutral media	.18	.04	—
Model 2b, pro-democracy supporters, $n = 464$	Pro-establishment media	2.10*	.21*	.19**
	Pro-democracy media	-9.83*	-.44*	—
	Neutral media	18.42**	.80**	—

Note: The attribute network of the neutral media is included as a control. * $p < .05$; ** $p < .01$; *** $p < .001$.

With respect to those people who did not exercise partisan selective exposure (H5), as shown in Table 2, Model 2a, pro-establishment supporters' attribute networks of the oppositional opinion repertoire were positively related to the attribute networks of the pro-democracy media ($\beta = .61, p < .05$). Likewise, a significant correlation was found between the attribute networks of pro-democracy supporters' oppositional opinion repertoire and the attribute networks of the pro-establishment media (Model 2b: $\beta = .21, p < .05$). Together, the findings suggest a significant and positive relationship between the attribute network of oppositional opinion repertoire and the attribute network of counter-attitudinal media among those who do not engage in partisan selective exposure, regardless of their political orientation, supporting H5 (see Supporting Information Appendix E).

We further examine the NAS effect of counter-attitudinal media on one's own opinion repertoire among those who did not engage in partisan selective exposure (RQ1). The results are mixed. As shown in Table 1, Model 3a, among pro-establishment supporters, the attribute network of one's own opinion repertoire was not significantly related to the attribute network of the counter-attitudinal (i.e., pro-democracy) media. However, it is worth noting that it is negatively associated with the attribute network of the pro-attitudinal (i.e., pro-establishment) media ($\beta = -.54, p < .05$). For pro-democracy supporters, the attribute network of one's own opinion repertoire was significantly associated with the attribute network of the counter-attitudinal (i.e., pro-establishment) media ($\beta = .20, p < .05$).

Discussion

Drawing upon three theoretical concepts—the NAS model, selective exposure, and deliberation—this paper examined the NAS effects of pro- and counter-attitudinal media on Hongkongers' perceptions of the Hong Kong–mainland China relationship. The findings demonstrated that different partisan media had different NAS effects on either one's own or oppositional repertoire, depending on whether an individual engaged in partisan selective exposure or not. We found that pro-attitudinal media was significantly related to not only how people think of an issue, but also how people think of the way the oppositional others perceive the issue, among those who demonstrated a pattern of partisan selective exposure. By contrast, for those who did not engage in partisan selective exposure, counter-attitudinal media was significantly associated with the perspectives of the oppositional others.

This study makes several important contributions to extend the NAS model. Based on original data in a non-Western context, the findings of this study provide strong evidence for the NAS model by extending it to a different political system and showing that the ways in which Hongkongers associate different sub-topics in their perception of the Hong Kong–mainland China relationship corresponds to news coverage. The current findings support that the news media are able to transfer the salience of a network of attributes—not just the salience of individual items—to the public agenda.

Methodologically, the study presents a unique approach to measure the public network agenda. Rather than inferring object or attribute associations (Guo, 2012; Wu & Guo, 2017), our online survey was designed specifically to test the NAS effect by directly asking the respondents how they associated attributes and the degree of the associations. This measure of explicit association provides a higher degree of validity of the results. Future researchers should also consider using our approach because it is easier to operate in an online survey context compared to an offline, mind-mapping survey.

Theoretically, the findings offer additional nuances to explain the NAS effect by considering one's partisan selective exposure, the effect of both pro- and counter-attitudinal media, and the difference between one's own and oppositional opinion repertoires. To our knowledge, our study is the first to empirically consider individuals' partisan selective exposure in examining the NAS model. Previous researchers found that partisan media did not always set the agendas of their followers (Vargo et al., 2014; Wu & Guo, 2017), which was supported and further explained in our analysis. To explain this phenomenon, we took a step further to consider individuals' media consumption patterns. It turned out that the NAS effect of partisan media became significant and positive for people from both political camps who consumed more pro-attitudinal media than counter-attitudinal media. In line with Stroud's (2011) findings that partisan selective exposure matters for the agenda-setting effect, we suggest that partisan selective exposure also plays a significant role in the network agenda-setting effect.

Borrowing from the concept of argument repertoire, this study examined the NAS effect not only on individuals' own opinion repertoire, but also on their thoughts about how oppositional others perceive the issue. This distinction proved to be significant, as it served to add another layer of explanation to the selective exposure effect. As the results showed, for pro-establishment Hongkongers who engaged in partisan selective exposure, the attribute network of the pro-establishment media was related not only to how they perceived the issue, but also to how they understood the perspectives of the pro-democracy camp. In addition, the attribute network of counter-attitudinal pro-democracy media did not show any relationship with that of this group of people (i.e., pro-establishment supporters). A similar pattern was found for pro-democracy Hongkongers. This finding is alarming because it suggests that a portion of people in Hong Kong (23.9%) consumed more pro-attitudinal information than any other types of information, which could potentially cause an echo chamber effect, since their political beliefs appeared to be significantly related to the pro-attitudinal media they consumed. These people's information processing pattern would strengthen their existing political position or attitude and foster a stereotyped evaluation of the political outgroup because their mental maps of the outgroup party were significantly related to the likeminded media. This would inevitably reinforce the political polarization of society, blocking the opportunity to bridge political divides in Hong Kong.

While the above findings are concerning, we also had some relatively more optimistic results. Acknowledging the limitation in our classification of the selective and non-selective exposure groups, which we will further discuss below, we found that about half of Hongkongers (50.9%) did not predominantly consume pro-attitudinal information over other information and had at least some degree of diversity in their media diet. For this group of people, their political views—in particular, how they understood the oppositional opinion repertoire—were related to the information presented in counter-attitudinal media. If people have a relatively more balanced media diet from different sides of media, counter-attitudinal media may help both pro-establishment and pro-democracy supporters understand each other's perspectives and form more accurate mental maps of the oppositional others. This finding suggests a significant role of exposure to counter-attitudinal viewpoints in the development of deliberative democracy.

Regarding how counter-attitudinal media relates to the non-selective exposure group's own opinion repertoire, we found that the attribute network of pro-establishment media was related to pro-democracy supporters' own opinion repertoire. This finding suggests that cross-cutting exposure could also promote one's understanding of an issue and enlarge one's point of view through using representative thinking. However, the pro-democracy media's network agenda was not related to the pro-establishment supporters' own opinion repertoire. This may be due to the fact that the pro-establishment media support the central government and, therefore, may have more resources for developing greater communication power. The results speak to the uniqueness of agenda-setting effects in a semi-democratic political context.

While not the focus of this study, it is noteworthy that the attribute network of neutral media was significantly correlated to that of most audience groups. This finding suggests that mainstream, neutral media remain powerful in a polarized media environment. This corresponds to the recent Hong Kong report in the Digital News Report (Reuters Institute for the Study of Journalism, 2018), which showed that the top four trusted brands are all neutral media. To further explore the issue, we compared the attribute networks of the three media types and found that neutral media appeared to be slightly more aligned to the pro-democracy media (QAP $r = .80$) than pro-establishment media (QAP $r = .75$) in covering the Hong Kong–mainland China relationship. This could mean the variance explained by pro-democracy media's attribute network could be somewhat underestimated among people who had a diverse media diet (i.e., non-selective exposure). In particular, it is worthwhile to revisit the finding that the network agenda of pro-establishment supporters was not significantly related to that of their counter-attitudinal, pro-democracy media, but was significantly related to the neutral media's agenda. Given the similarity between the pro-democracy and neutral media's attribute networks, it is possible that this group of people still encountered counter-attitudinal information (but from neutral media) that, to some extent, was related to how they perceived the Hong Kong–mainland China relationship. The differences and similarities

between neutral and partisan media and their relative impact warrant further examination.

Limitations and future research

The findings cannot be interpreted without limitations. First, although our study was built on the agenda-setting theory, which assumes a causal effect in which the salience of the agenda was transferred from the media to the public, and we collected the media content data prior to the public opinion survey, our analysis cannot rule out reverse causality from the public agenda to the media agenda. Future studies should include a panel design to better account for the causal direction.

Second, what we examined in the present study is the aggregate-level agenda-setting effect. The relationships we investigated are between the attribute networks of different groups of media and different groups of publics. While this Gestalt approach focusing on aggregate-level media effects follows the standard NAS research design, it cannot fully explain individual variances in terms of media consumption and, ultimately, agenda-setting effects. Again, future researchers should consider a panel design to examine individual-level NAS effects by pairing each individual's specific media exposure and his/her perceived issue or attribute associations. Doing so would offer further insight into the extent to which partisan selectivity moderates the NAS effect.

Third, although we followed a theoretical conceptualization to categorize selective exposure or non-selective exposure groups based on one's preference for pro-attitudinal over other media (Stroud, 2017), this approach of classification could be arbitrary. A different approach would be to further classify the respondents into different selective exposure levels and different types. We tested two alternative methods of measuring respondents' selective exposures. However, it turned out that further distinguishing between exposure types reduced the sample size in each group and compromised the size of the effect (see Supporting Information Appendix F). Future researchers could test these methods in larger samples.

We should acknowledge that our categorization of selective and non-selective exposure groups does not consider individuals' overall amounts of media exposure. It is possible that some people categorized in the selective exposure group rarely consumed news, which may affect the results. To probe into this issue, we conducted a descriptive analysis of the data and found that very few Hongkongers reported low media consumption frequency in our sample. We also conducted an additional network analysis by categorizing respondents into four groups: selective and high overall exposure, selective and low overall exposure, non-selective and high overall exposure, and non-selective and low overall exposure. We found that regardless of one's overall amount of media exposure, the pattern of the NAS effect among the selective exposure group stayed similar, while for the non-selective exposure group, consuming a certain amount of media appears to be necessary

for the effect of counter-attitudinal media to take place (Supporting Information Appendix G).

Lastly, although we include the available local media outlets in Hong Kong as much as possible and use a measurement of media consumption that has been widely employed in the agenda-setting studies, it is possible that social desirability and the difficulty of recalling the consumed media content could prompt people to over-report their media consumption (Prior, 2009). Future studies could utilize experimental designs, naturalistic data collection (e.g., Nielsen), and log tracking to measure media consumption and examine whether the proposed relationships are sustained. Acknowledging this limitation, our study strives to provide a reasonable test of the theoretically derived prediction.

Despite the limitations, this study has contributed to the NAS model in several theoretical and methodological aspects. It provides a better understanding of how NAS varies based on one's partisan selective exposure and how pro- and counter-attitudinal media relate to one's own and oppositional opinion repertoires, which could lead to further research with more classic deliberation measures. In addition, this study sheds light on the evolving media landscape in Hong Kong, providing important implications for understanding political polarization and the region's political climate in terms of its relationship with the mainland.

Supporting Information

Additional Supporting Information may be found in the online version of this article.

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Acknowledgments

This work was supported by grants from the Research Grants Council of the Hong Kong Special Administrative Region, China (CUHK 24613415).

The authors thank Editor-in-Chief, Dr. Lance Holbert; Associate Editor, Dr. Michael Scharkow; and the four anonymous reviewers who have provided valuable advice and helpful comments on this work. The authors also thank Cheng Chen and Hans Tse for their assistance with the content analysis.

Notes

1. The National Congress of the Communist Party of China is one of the most important events for the Chinese Communist party. It has been held every 5 years since 1987 and usually involves leadership changes and power shifts that gain both domestic and international media attention.

2. Results of the opinion repertoires among the neutral group are reported in Supporting Information Appendix H.
3. We conducted a modularity test to identify sub-communities among media outlets based on their QAP correlation coefficients. The result suggested that the pre-determined pro-establishment and pro-democracy media were indeed assigned to different communities, with only two outliers: *BastillePost* and *Initium Media*. The modularity test justifies our categorization of media groups and, therefore, we summed up all matrices for pro-establishment, pro-democracy, and neutral media separately. We decided to keep the two outliers in their original, partisan media groups because of their strong political inclinations.

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