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Opinion leadership in a leaderless movement: discussion of the anti-extradition bill movement in the 'LIHKG' web forum

Hai Liang and Francis L.F. Lee

The Chinese University of Hong Kong, Hong Kong

ABSTRACT

Contemporary networked social movements are often described as leaderless. However, social influence is inevitably unevenly distributed across participants, so informal and diffused leaders do exist. This study contends that analysis of informal and diffused leadership in networked social movements should examine whether such leadership is stable and what factors might explain who can take on a leadership role. Starting from these premises, this study investigates discussions of the Anti-Extradition Law Amendment Bill Movement in Hong Kong on the online forum LIHKG. Analyzing millions of movement-related and non-movement-related comments revealed that influence was highly unevenly distributed and that opinion leadership was more unstable in movement-related discussions. Opinion leadership was related to personal characteristics and communication activities, but sometimes in ways that were specific to movement-related discussions. Moreover, opinion leadership tended to stabilize over time. The findings provide insights into the characteristics of informal and diffused leadership in networked social movements.

Since the late 2000s and 2010s, scholars have paid attention to the emergence of what Castells (2012) calls networked social movements, which are formed among existing social and organizational connections through the use of networked media technologies. Such movements are typically marked by leaderlessness, decentralized organization, and bottom-up participation, following the logic of digitally enabled connective action (Anduiza et al., 2014; Bennett & Segerberg, 2013; Castells, 2012). These characteristics have been celebrated for their many advantages (e.g., Caraway, 2016; Donovan, 2018; Mico & Casero-Ripolles, 2014; Zeng, 2020), but some have noted the limitations imposed by decentralization (Lee & Chan, 2018; Tufekci, 2017). Previous studies have attempted to understand how protesters could organize without formal and centralized leadership. For example, Bennett et al. (2014) pinpoint the role of stitching technologies in the processes of production, curation, and dynamic integration in peer production on Twitter.

However, other scholars have questioned the sense in which a networked social movement is leaderless. While a networked social movement does not have central leaders recognized by most participants as such and responsible for designing movement

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strategies, providing action opportunities, articulating movement frames, and negotiating with those in power, certain individuals or groups are comparatively influential in shaping movement dynamics (Tufekci, 2017). These individuals or groups include those who coordinate specific protest activities, who articulate emergent movement discourses, who propose innovative tactics, and so on. In place of traditional leadership that is characterized by a top-down approach, leadership has become more decentralized, informal, diffused, and possibly unstable (Castells, 2012).

Therefore, instead of emphasizing the notion of leaderlessness, it is worth examining the characteristics of the informal and diffused leadership in networked social movements. The present study thus focuses on opinion leadership in the prominent discussion forum LIHKG during the 2019 Anti-Extradition Law Amendment Bill (Anti-ELAB) Movement in Hong Kong. Given the prominence and influence of LIHKG discussions (Lee et al., 2021), opinion leaders on LIHKG can be situated among the informal and diffused leaders in the movement. We seek to map the formation and evolution of opinion leadership on LIHKG by examining the extent to which social influence was evenly distributed and, more importantly, by assessing whether inequality in social influence was stable over time. We also examine the factors that could explain why certain individuals rather than others became opinion leaders. This analysis offers insights into not only opinion leadership in movement-related discussions but also the characteristics of informal and diffused leadership in networked social movements more broadly.

The next section provides background on the Anti-ELAB Movement and LIHKG, after which we discuss the notion of informal and diffused leadership in networked social movements. The research questions and hypotheses are then laid out before being investigated through a computational analysis of LIHKG content.

Anti-ELAB movement and LIHKG

The Anti-ELAB Movement originated in the opposition to the Hong Kong government's proposal to amend the Fugitive Ordinance to allow Hong Kong to extradite suspects to Taiwan and mainland China. The proposal aroused enormous opposition due to the widespread public distrust of the Chinese legal system. The Civil Human Rights Front (CHRF) organized two protest marches on 3 March and 28 April 2019, respectively. Then, on 9 June, three days before the bill was to be tabled at the Legislative Council, a million citizens joined another CHRF protest.

The government's decision to move ahead despite the huge protest turnout led tens of thousands of citizens to surround the Legislative Council Complex on 12 June. The meeting was canceled, and clashes between protesters and police ensued. The government announced the suspension of the bill on 15 June, but protesters continued to demand its full withdrawal. In addition, protesters' attention had already turned to perceived abuses of power by the police and the situation of protesters who had been arrested (Lee et al., 2019).

Although the earliest and largest protest marches were organized by CHRF, the protests quickly took up some of the characteristics of networked social movements. Following a tradition of spontaneous protests and citizen self-mobilization in Hong Kong (Cheng, 2016; Lee & Chan, 2011, 2018), ordinary citizens worked together to carry out a

wide range of often innovative actions, such as Baltic-inspired human chains, airport sit-ins, collective singing of movement songs in malls, flash mobs at lunchtime, and the placement of newspaper advertisements around the world. Like other networked social movements (e.g., Flesher Fominaya, 2020; Tufekci, 2017), established groups such as CHRF did have a role in these efforts, but they were not the central organizers of the movement as a whole. Commentators generally described the Anti-ELAB Movement as leaderless (e.g., Ag, 2019).

Also similar to other networked social movements, the coordination of many of these protest actions was digitally enabled. In addition to Facebook and WhatsApp, the most frequently used social media tools among the Hong Kong public (Chan et al., 2019), two digital media platforms attracted particular attention. The first is Telegram, on which numerous movement-related groups and channels were established. The largest movement-related public groups had tens of thousands of participants, while small groups of individuals could create private groups to coordinate specific actions (Hill, 2019).

More important for the present study, the online forum LIHKG was widely regarded by both the media and the public as the central communication platform for movement participants and supporters. The forum was established in late 2016. Between January 2017 and May 2019, it attracted an average of 3,439 newly registered users per month. But in June, July, and August 2019, the forum had 9,791, 14,519, and 11,832 newly registered users, respectively. In a poll conducted by a newspaper during the protest on 1 July 2019, 55% of respondents regarded LIHKG as the most influential medium in the movement (Apple Daily, 2019). A series of onsite protest surveys showed that, as the movement progressed from June to September and beyond, protesters increasingly treated LIHKG as an important information source. At the individual level, the use of LIHKG was positively associated with feelings of solidarity, agreement with emerging movement discourses and tactics, and support for radical actions among protesters (Lee et al., 2021). In other words, LIHKG discussions had an important influence on the dynamics of the Anti-ELAB Movement. If there were individuals who had exercised substantial influence on LIHKG discussions, these individuals could also be considered as having exercised substantial influence on the Anti-ELAB Movement as a whole.

Notably, LIHKG has certain affordances that make it relatively difficult for anyone to establish opinion leadership. First, it is simply a large forum in which almost all users employ pseudonyms. Users are generally unaware of one another's background and credentials. Second, the forum does not facilitate the deliberate following of other users. This contrasts with social media platforms such as Facebook and Twitter; people cannot create spaces for their followers to congregate, and there is no network structure linking individual users with one another. Third, although LIHKG is sometimes compared to Reddit, LIHKG has no system similar to Reddit's karma points for users to showcase their popularity and credibility. However, these factors do not mean that opinion leadership on LIHKG is somehow impossible. Specific users and individual posts did vary in terms of reach and influence. The empirical challenge is to understand the formation and characteristics of opinion leadership on this forum.

Leadership in networked social movements

Conventionally, social movements are regarded as emerging through processes of resource mobilization centering on formal social movement organizations. Leadership is a significant issue in the examination of movement mobilization, as leaders define issues, frame injustices, operate organizations, recognize opportunities for action, and make strategic decisions (Staggenborg, 2011). Against this background, networked social movements are considered leaderless in the sense of the absence of professionalized leaders, a formal leadership structure, and/or people and groups who are actually capable of steering a protest movement (Castells, 2012; Flesher Fominaya, 2020).

However, the term 'leader' can also simply mean a person or group that attracts followers and exerts disproportionate influence on others (Hollander, 1961; Robinson, 2001). In the tradition of research on opinion leadership in the two-step flow of communication, opinion leaders are those who exert influence on their peers' views (Weimann, 1991). Lee and Chan (2015) define a 'participation leader' in collective action as a person 'who contributes to the mobilization process behind a political activity by making people around him or her more likely to participate in the activity' (p. 880). In the context of web forum discussions, Huffaker (2010) considers leaders to be those who can trigger durable conversations, where the ability to spark conversations is an indicator of social influence. That is, if a user initiates a discussion thread and receives many replies and reactions (e.g., likes), that user is influential and thus could be considered a leader.

In fact, studies have found that online protest participation is unequally distributed and usually characterized by a power-law distribution (Gonzalez-Bailon et al., 2013). Influence within a protest movement can be distributed similarly unevenly. For instance, Hill et al. (2018) found that soft leaders such as fanzine editors and forum administrators could organize and facilitate online discussions and protests, and Tufekci (2017) found that outspoken participants in a horizontally organized forum can exert a disproportionate influence on the discussion. Tufekci's (2013) concept of networked microcelebrity also hints at the role of influential individuals in propelling networked social movements.

When leaders are defined in the sense of people who exert disproportionate influence on a protest movement, networked social movements might be seen not so much as leaderless but 'leaderful,' that is, there can be many individuals and groups exerting significant influence on the movement by their ideas and actions. This leadership is informal and diffused; it is not based on a formal organizational role and is practiced by many people in specific locations and areas within the broader space of a protest movement.

Of course, informal leadership is not a totally new phenomenon. Even before the advent of the internet, Freeman (1972) noted that informal leadership is inevitable in apparently 'structureless' movements. This is because individuals have different talents, predispositions, and backgrounds and are connected in uneven ways. Specific institutions like the media and government also need to identify individuals who can serve as representatives of a movement. Over time, some individuals will inevitably emerge to become more influential than others.

However, the 'structureless movement' analyzed by Freeman (1972) remains different from contemporary networked social movements. In Freeman's analysis, the informal leadership structure emerging from an apparently structureless movement is largely stable. In fact, her critique of the 'tyranny of structurelessness' centered on how the absence of formal organizational structures makes challenging and changing informal leadership even more difficult. It also implies that informal leadership in Freeman's structureless movement is not necessarily diffused. It can remain concentrated in the hands of a few informal leaders.

In contrast, while Castells (2012) also acknowledges that networked social movements display 'multiple instances in which some of the participants are more active or more influential than others, just by committing themselves full-time to the movement .... these activists are only accepted in their role as long as they do not make major decisions by themselves' (p. 224–5). Given the diversity of action repertoires involved, the often complex and contingent evolution of networked social movements, and a culture favoring grassroots and spontaneous participation (Flesher Fominaya, 2020; Ho, 2019; Lee & Chan, 2018), leadership roles are much more likely to be distributed across a wide range of people. The leadership structure is also likely to be much more open to change.

Research questions and hypotheses

The conceptual considerations outlined in the previous section lead to several questions for empirical analysis. How concentrated and stable is the informal leadership in a networked social movement? Do the same people wield disproportionate influence consistently or do different groups of people take up leadership in turn? What factors explain why some people rather than others obtain the influence they do? These general questions can be turned into more specific research questions and hypotheses by putting them into the context of LIHKG and the Anti-ELAB Movement.

The first question to pose involves the degree of concentration of opinion leadership; that is, whether social influence in online discussions becomes concentrated in the hands of a few individuals or is dispersed more widely across a large number of people. We have noted above that LIHKG has certain features that render the establishment of sustained opinion leadership difficult, so the architecture of the online forum might contribute to the dispersion of opinion leadership. But in addition to forum characteristics, the previous section shows that informal leadership in networked social movements is likely to be diffused and dispersed across more individuals. Therefore, considering forum design, we expect a degree of dispersion in opinion leadership on LIHKG in general. On top of this, considering that informal leadership in networked social movements is likely to be diffused and dispersed, we expect movement-related discussions on LIHKG to exhibit a higher level of opinion leadership dispersion than non-movement discussions. Hence the first research question and hypothesis are as follows:

RQ1: To what extent is opinion leadership dispersed or concentrated on LIHKG?

H1: On LIHKG, opinion leadership in movement-related discussions is more dispersed than opinion leadership in non-movement-related discussions.

The diffused character of informal leadership in network social movements may also become manifest over time. Hence, the stability of opinion leadership is another key issue for analysis. Notably, past research on opinion leadership generally indicates a high degree of leadership stability over time (Rogers, 2003). For example, O'Brien et al. (1998) found that leaders in five rural communities were stable over six years (but see Doumit et al., 2011). However, few studies have measured the stability of opinion leadership in the context of social movements. We expect a significant degree of instability in opinion leadership in the Anti-ELAB Movement for two reasons. The first is the already explicated point that informal leadership in networked social movements is likely to be dispersed and diffused rather than consistently concentrated among the same small group of individuals. Second, the Anti-ELAB Movement in particular lasted for more than six months, with many significant incidents and twists and turns (Ma, 2020). The movement continually needed to respond to new questions posed by the fluid situation and invent new tactics to sustain the movement under dynamic conditions. The forum users who had 'the most appealing answers' to the most urgent questions could also change with some frequency. Hence there could have been a constant reshuffling of opinion leadership over time.

Again, since LIHKG itself has certain features that render the establishment of sustained opinion leadership difficult, we need to compare movement-related and non-movement-related discussions to ascertain whether leadership instability indeed results at least partly from the character of networked social movements. If the character of networked social movement matters, then movement-related discussions should exhibit a higher level of opinion leadership instability. Hence, the second research question and hypothesis are as follows:

RQ2: To what extent are the degrees of influence enjoyed by individual opinion leaders stable over time?

H2: On LIHKG, when compared to non-movement-related discussions, the degree of leadership instability is higher in movement-related discussions.

However, even if opinion leadership is unstable in general, it is still possible for the degree of opinion leadership stability to increase over time, indicating a process of stabilization. Previous studies have pointed out that, even with an anti-leadership culture, leadership in social movements did stabilize in some cases (Sutherland et al., 2014). In online discussions, influencers may accumulate impact through the mechanism of preferential attachments or the popularity effect (Barabasi & Albert, 1999; Himelboim, 2011). If participants are not critical and reflexive, informal hierarchies may emerge and reproduce broader social and cultural inequalities (Sutherland et al., 2014). Whether stabilization occurs on LIHKG in the Anti-ELAB Movement is an open matter, so we address the following question:

RQ3: Does the instability of leadership at the aggregate level decrease over time?

The next set of issues to be addressed is why certain people become leaders. Past research has suggested that social movements and opinion leadership can be based on personal characteristics, communication activities, and social network positions (Cha et al., 2010; Gonzalez-Bailon et al., 2013; Huffaker, 2010). Personal characteristics can refer to demographic factors such as age, gender, and educational level or the kinds of skills and experience relevant to the work that needs to be done (Goldstone, 2001; Morris & Staggenborg, 2004; Robnett, 1997; Wood, 2005). Communication activities can refer to the degree to which individuals actively engage in online conservations with others (Rice, 1987). From a network analytic perspective, social influence and network centrality are closely related (e.g., Chen & Teng, 2017). Research into social media has found that users with more connections and reciprocal ties can trigger more replies to their posts (Huffaker, 2010).

As noted above, LIHKG does not facilitate the formation of fixed network structures. There is also not much information about the characteristics of individual users. The current analysis focuses on membership seniority and communication activities as possible predictors of opinion leadership. Membership seniority refers to how long a user has been a member of a given online community. Normally, long-time community members are more likely to become opinion leaders because they would have a more intimate understanding of the culture of the online community and have developed more and closer relationships with others. However, in the case of LIHKG during the Anti-ELAB Movement, the protests led to a rapid proliferation of new users, and the forum was suddenly home to a very focused discussion about the protest movement; any advantage among older users may well have been diminished or even eliminated. Moreover, the culture favoring decentralization and spontaneous participation in a networked social movement might lead people to dismiss the relevance of those who could be viewed as the 'old guard.' Therefore, we propose the following hypothesis:

H3: The positive relationship between membership seniority and opinion leadership is weaker in movement-related discussions than in non-movement-related discussions.

Meanwhile, we also examine how opinion leadership related to the degree to which users were active in posting messages and responding to others. Generally speaking, active communication can foster a sense of social identity, obtain information, and build relationships (Koh et al., 2007; Rice, 1987), all of which typically contribute to social influence. Regular posting of messages and responding to others might also contribute to name recognition among forum users. But as discussed above, leaders in networked social movements are expected to maintain their leadership roles only to the extent that they are willing to listen, respond, and be accountable to others. The extent to which communication activities shapes opinion leadership might vary across movement- and non-movement-related discussions. Having said that, given the lack of more concrete arguments that would allow us to anticipate more specific patterns of findings, we pose the following exploratory research question:

RQ4: To what extent do message posting and replying activities predict opinion leadership in movement-related and non-movement-related discussions?

Method

Data collection

The data analyzed below were collected from LIHKG (www.lihkg.com). We archived all posts and comments published on the forum between 1 June and 31 December 2019. Although the Anti-ELAB Movement continued into 2020, collective actions subsided early in that year, so examining the second half of the year 2019 should allow us to discern the dynamics of online discussions at the peak of mobilization. In many ways, LIHKG is a typical online discussion forum with a conventional design. Users can initiate discussion threads and post replies to any threads and can 'like' threads or replies posted by others. However, unlike platforms such as Facebook or Twitter, there are neither following nor friending functions, although there are different sub-forums (known as channels on LIHKG) to organize threads about specific topics. Most Anti-ELAB-related posts appeared in the public affairs channel.

We created two datasets – movement discussion and non-movement discussion – from the complete archive. The movement discussion dataset includes all posts and comments from the public affairs channel. There were 18,948,823 comments in 290,570 threads involving 154,305 unique users. Although the channel was designated for the discussion of the full range of public affairs, the Anti-ELAB Movement constituted the overwhelmingly most important news topic in the period under study. Hence, an absolute majority of posts were related to the movement. As a reference group, we selected six of the top ten active channels – entertainment, movies, love, game, sports, and apps – that are much less relevant to politics or public affairs. Furthermore, we removed potentially movement-related discussions using 36 keywords (e.g., protest, demonstration, strike, revolution). The keywords were identified using the log-odds ratio algorithm (Stubbs, 2010) to extract the most discriminant terms between movement and non-movement discussions. The non-movement dataset includes 3,274,648 comments from 24,432 threads posted from 1 September (the day the six channels were created) to 31 December 2019; those discussions involved 68,657 unique users.

Measures

Influence and influentials

Three indicators were used to measure influence in LIHKG: number of replies received, number of likes received, and number of unique users who replied. Certainly, having many replies does not necessarily translate to an ability to persuade, but attention is a precondition of influence, and if a user can attract attention repeatedly, it is likely that other users do find their posts agreeable and appealing. In addition, being able to generate discussions is itself a kind of influence (Huffaker, 2010). Hence, it should be reasonable to treat reactions received as indicators of influence.

The unit of analysis is 'user-in-a-week': for each user who initiated at least one thread, we calculated the number of replies, likes, and unique responding users the original user received in each week. If a user initiated multiple threads in a given week, the sums of these metrics were used. In the movement dataset, 37,522 users posted at least one thread. On average, users in a week received 147.8 replies (Mdn = 17, SD = 472.97), 392.2 likes (Mdn = 11, SD = 1,387.83), and replies from 97.61 unique users (Mdn = 11, SD = 305.54).

The Spearman's rank-order correlation coefficients between the indicators are 0.88 (p < .001), 0.97 (p < .001), and 0.88 (p < .001), respectively, with standardized Cronbach's alpha = .94. In the non-movement dataset, there were 7,194 thread initiators. On average, these users in a week received 234.29 replies (Mdn = 25, SD = 720.42), 45.45 likes (Mdn = 3, SD = 210.77), and replies from 53.34 unique users (Mdn = 15, SD = 112.86). The reliability of the three items is lower than that in movement discussions, with a standardized Cronbach's alpha of .65.

Inequality of user influence

Following Freelon et al. (2018) and Steinert-Threlkeld (2017), Gini coefficients were used to measure the inequality of influence over time. The Gini coefficient is a common measure of economic inequality that ranges from zero to one, with zero signifying perfect equality. We calculated coefficients for replies, likes, and unique responding users separately and week by week. The inequality of user influence indicates the presence of opinion leaders. Descriptive statistics are reported in the Results section.

Instability of user influence was measured by the coefficient of variation of the relative ranks of the user's influence over weeks. Given that the three influence metrics created above are highly correlated and the conceptual consideration that the ability to trigger durable discussions is a kind of influence, we focused on the number of replies when examining instability. First, we ranked all users according to the number of replies they received every week. Then, their relative rank, which also ranged from zero to one, was normalized by the rank divided by the maximum rank in a given week. The coefficient of variation is the standard deviation of the relative ranks across weeks divided by the mean; it would be zero if a user ranked at the same position in all weeks. Conversely, a value closer to one indicates that the user's ranks varied a great deal. For thread initiators in movement discussions, the average influence instability score was 0.15 (Mdn = 0.11, SD = 0.15). In non-movement discussions, the average was 0.15 (Mdn = 0.12, SD = 0.14).

Instability of leadership at the aggregate level could also be measured. In each week, thread initiators could be ranked according to their influence (i.e., the number of replies received) during that week. Hence, there are 32 different rank orders of the participants in the 32 weeks in the period under examination. If leadership at the aggregate level was stable, we would expect the 32 rank orders to be largely the same. We thus calculated the rank-order correlation between any two consecutive weeks to indicate the stability of aggregate leadership between those two weeks. Thread initiators may not post every week, so we calculated the rank correlations for users active in consecutive weeks. In the movement dataset, the mean correlation was 0.41 (SD = 0.01). In the non-movement dataset, the mean correlation is 0.58 (SD = 0.07).

Predictors of user influence

For the analysis of factors that contribute to opinion leadership, the present study included two user characteristics: self-reported *gender* (75% male in movement and 70% male in non-movement) and *account age*, which measured membership seniority (movement: M = 690.71 days, Mdn = 806.67 days, SD = 399.12; non-movement: M = 700.37, Mdn = 823.16, SD = 400.83). Both variables were scraped directly from the website. Communication activities were measured by the *number of threads* initiated (movement: M = 7.74, Mdn = 2, SD = 43.31; non-movement: M = 3.40, Mdn = 1,

SD = 13.49) and the *number of replies* to others (movement: M = 348.87, Mdn = 79, SD = 1,024.77; non-movement: M = 246.01, Mdn = 24, SD = 1,054.25) posted by thread initiators in all weeks.

Results

Inequality and concentration of user influence

Figure 1 presents the Gini coefficient trends of user influence over weeks. The average of the Gini coefficients for the distribution of replies was 0.80 (Mdn = 0.81, SD = 0.02), the average for likes was 0.88 (Mdn = 0.88, SD = 0.02), and the average for unique responding users was 0.81 (Mdn = 0.82, SD = 0.02). The respective coefficients in non-movement discussions were 0.82 (Mdn = 0.82, SD = 0.02), 0.89 (Mdn = 0.89, SD = 0.01), and 0.71
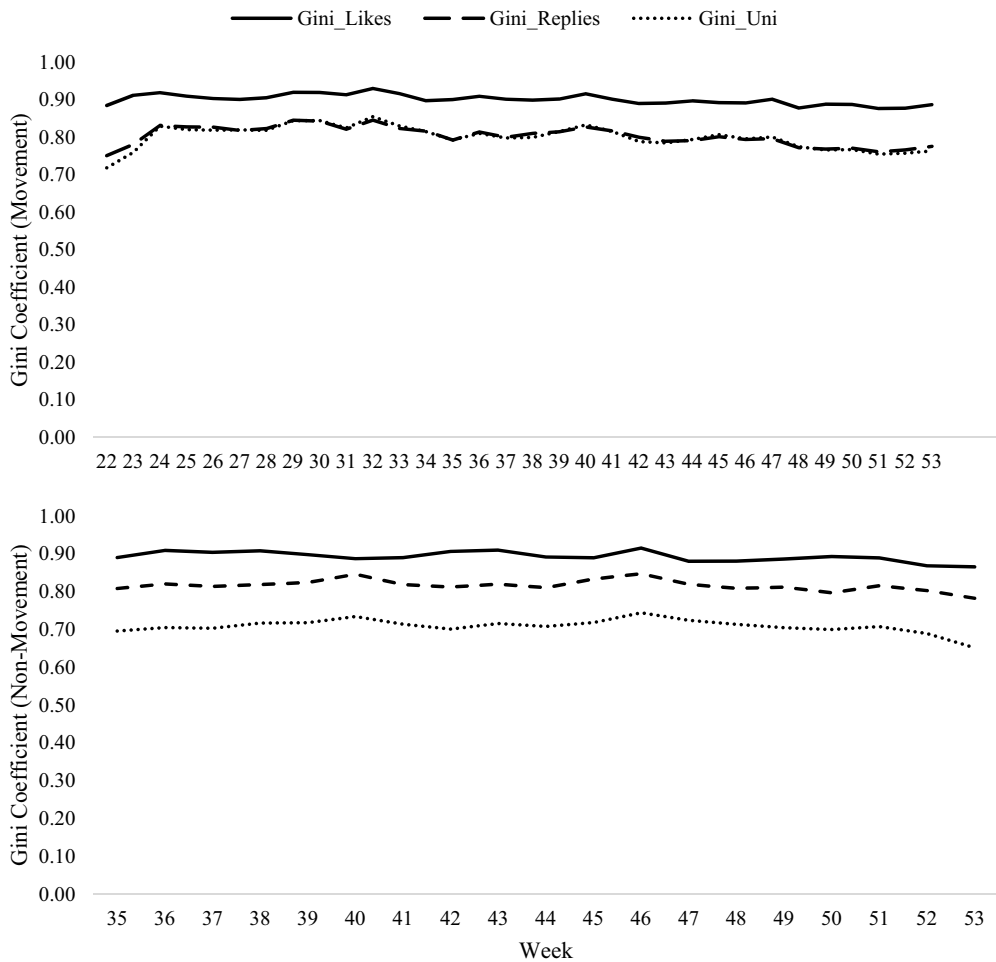
Figure 1. Inequality of user influence (Gini coefficients) over time. Gini_Likes: Gini coefficient of the distribution of the number of likes. Gini_Replies: Gini coefficient based on the number of replies. Gini_Uni: Gini coefficient based on the number of unique users.

(Mdn = 0.71, SD = 0.02). The results suggest that a small number of users attracted the greatest number of likes and replies, but this result was not specific to movement discussions. A series of one-sided t-tests suggest that the inequality in likes/replies in movement discussions was not significantly greater than those in non-movement discussions (t_{likes} = −3.19, p = .998; $t_{replies}$ = −0.90, p = .814), whereas the distribution of unique responding users was more unequal in movement than in non-movement discussions (t = 16.77, p < .001). Overall, in response to *RQ1* and contrary to our expectations, opinion leadership on LIHKG seems to be very concentrated, and social influence is not more dispersed in movement than in non-movement discussions. Thus, *H1* is not supported.
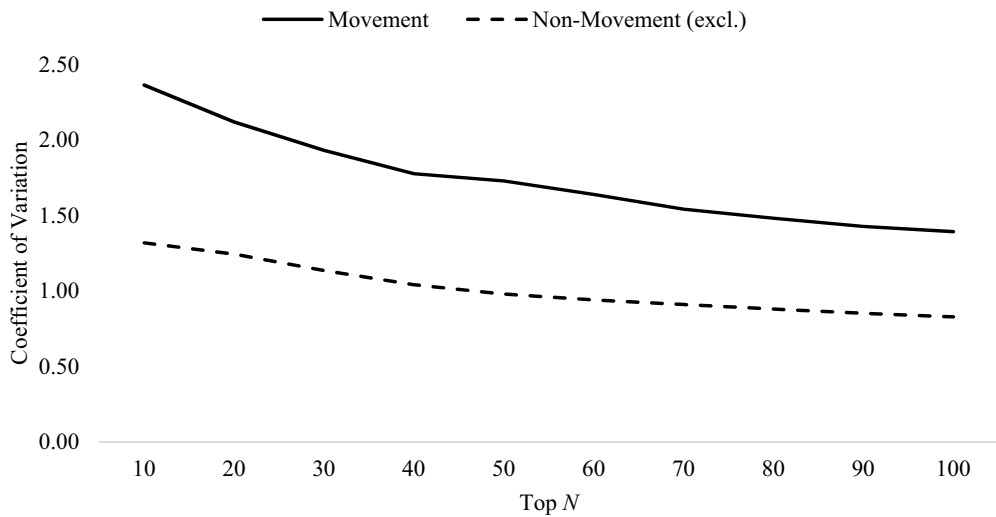
Instability of user influence

Regarding *RQ2*, we can first obtain a more concrete sense of leadership (in)stability by examining the users who ranked in the top ten in terms of number of replies received in any week. If leadership were completely stable, those ten users would remain the same. In the other extreme scenario, the top ten users in the 32 weeks would all be different, meaning that 320 users would have been in the top ten list once and only once. The actual result shows that the most influential user appeared 22 times over the 32-week period, with three other users appearing more than 16 times. This explicates the high level of opinion leadership concentration noted in the previous section. Beyond these few users, however, opinion leadership was notably more dispersed and unstable. Overall, 147 users appeared in at least one of the 32 top ten lists in movement discussions, which is 45.9% of the largest possible number (147/320). Among those 147 users, 113 (76.9%) appeared only once in the top ten lists. Thus, for the majority of users, even those who obtained a degree of opinion leadership for a short period of time, that leadership was often a fleeting occurrence.

By comparison, in the 20 weeks of non-movement discussions under examination, the most influential users appeared in the top ten lists 13 times. Four users appeared more than 10 times. These figures again demonstrate the high level of opinion leadership concentration noted above. However, only 75 users were in a top ten list at least once, which is 37.5% of the largest possible number (75/200). Among these 75 users, only 46 (61.3%) were one-time opinion leaders. Consistent with our expectation, the results suggest that opinion leadership is more stable in non-movement discussions.

More formally, the average coefficient of variation of the top ten influentials (based on overall rank) in movement discussions was 2.36 (SD = 1.11), which is significantly larger than the one found in non-movement discussions (M = 1.32, SD = 0.43; t = 2.77, p = .009). Figure 2 presents systematic comparisons between the coefficients of variation of the top *N* in the two datasets. As the figure shows, the coefficients are consistently higher in movement-related discussions. All differences are statistically significant at the .05 level, and *H2* is thus confirmed.

Regarding *RQ3*, leadership stability could also be measured at the aggregate level by week. Figure 3 presents the rank-order correlations between consecutive weeks over time for movement and non-movement discussions. On average, leadership was more stable in non-movement than in movement discussions. In the latter, the correlation was positively associated with time (r = 0.61, p < .001), indicating that leadership stability

Figure 2. Instability (coefficient of variation) of user influence. Top *N* indicates the top influentials in terms of the total number of replies in all weeks. Coefficient of variation was calculated based on the relative ranks of the users in each week.
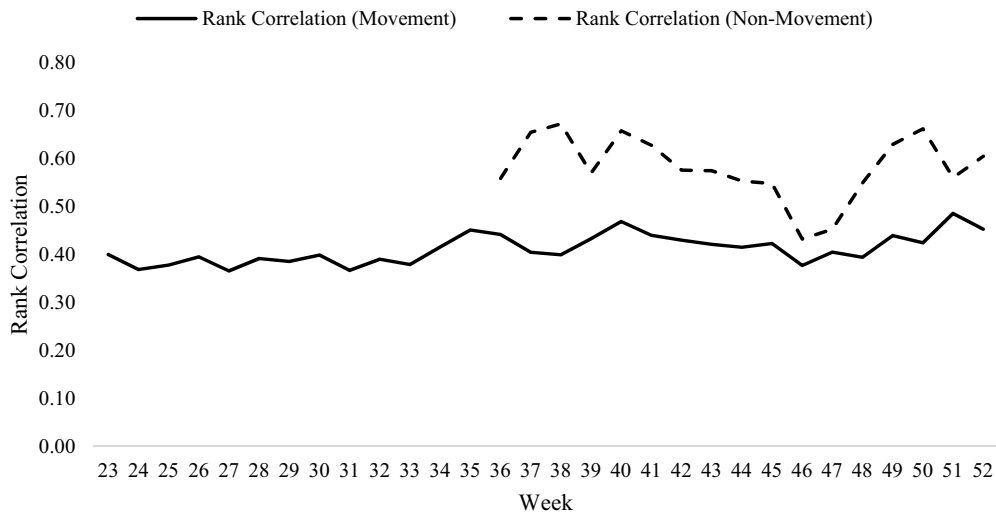
Figure 3. Stability of leadership at the aggregate level (rank-order correlation) over Time. In the movement dataset, the regression coefficient of week is 0.0021 ($p < .001$) .

in movement discussions increased over time. In non-movement discussions, the correlation between time and rank-order correlations was not significant ($r = -0.24$, $p = .27$). However, it should be noted that the rank-order correlation remained under 0.50 for movement discussions even toward the end of the period under examination, and that figure stayed lower than the corresponding correlation for non-movement discussions.

In sum, there is a weak trend of opinion leadership stabilization in movement discussions, but opinion leadership in movement discussion is still less stable than leadership in non-movement discussion.

Predicting user influence

Given that the distribution of the dependent variable (the number of replies) is highly skewed, we employed a negative binomial regression model to test our hypotheses. The results are presented in Table 1. Overall, the model fit the non-movement dataset better than the movement dataset.

In general, the effects of the independent variables were directionally consistent in both movement and non-movement discussions. The similarity in predictors of user influence in movement and non-movement discussions suggests that opinion leadership in online forums can be shaped by forum features and/or the basic logic of online discussions in general. However, we proposed *H3* based on the specific character and culture of networked social movements and posed *RQ4* as an exploratory question. The last column in Table 1 presents the relevant interaction effects between the independent variables and the two datasets. The effect of account age on user influence in movement discussions was indeed smaller than that in non-movement discussions; therefore, *H3* is supported. Meanwhile, the effect of the number of threads was greater in movement discussions, while the effect of the number of comments on user influence was smaller in

Table 1. Negative binomial regression models in predicting user influence.

	Movement		Non-Movement		Combined	
	Estimates (SE)	*Standardized Estimates*	*Estimates (SE)*	*Standardized Estimates*	*Estimates (SE)*	*Standardized Estimates*
Intercept	1.89*** (0.06)	−7.25	0.84*** (0.11)	−5.88	0.84*** (0.12)	−9.55
Gender (male)	−0.18*** (0.02)	−0.13	−0.07* (0.03)	−0.11	−0.08* (0.04)	−0.11
Account age (log)	0.09*** (0.01)	0.41	0.18*** (0.02)	1.33	0.18*** (0.02)	1.33
# threads (log)	1.06*** (0.01)	13.31	0.64*** (0.03)	4.89	0.64*** (0.03)	10.11
# replies (log)	0.27*** (0.00)	3.61	0.64*** (0.01)	9.22	0.64*** (0.01)	9.35
Movement vs. Non-movement					1.05*** (0.13)	2.82
Gender × Movement					−0.10* (0.04)	−0.02
Age × Movement					−0.09*** (0.02)	−0.92
# threads × Movement					0.43*** (0.03)	2.46
# replies × Movement					−0.37*** (0.01)	−5.76
θ	0.52 (0.00)		0.61 (0.01)		0.53(0.00)	
N	37,522		7,194		44,716	
R^2 Nagelkerke	78.9%		88.6%		80.7%	

Log indicates that the variable was log-transformed; estimates are in cells and standard errors (SEs) are in parentheses. The standardized estimates were estimated by refitting the models with the original data rescaled by two SDs from the means. The interaction coefficients are consistent by including the interaction terms into the model one by one. * $p < .05$; ** $p < .01$; *** $p < .001$

movement than in non-movement discussions. That is, while communication activities were positively related to opinion leadership in both kinds of discussions, posting more messages was particularly important for establishing opinion leadership in movement discussions, whereas replying to others was less important.

Discussion

This article aims to contribute to the understanding of the dynamics of informal and diffused leadership in the context of a networked social movement. Although networked social movements typically lack central and formal leaders, there are inevitably individuals and groups with greater influence than others. Key issues regarding such informal and diffused leadership are 1) the degree to which influence is dispersed overall, 2) whether informal leadership is dispersed (i.e., unstable) over time, and 3) what factors contribute to the leadership role of specific participants (Castells, 2012; Lee & Chan, 2018). Our expectation is that, in discussions in a networked social movement, user influence should be less concentrated, less stable, and less determined by membership seniority.

The empirical analysis addresses these issues through an examination of discussions on LIHKG during the Anti-ELAB Movement. This analysis is premised on the prominence and influence of LIHKG discussions (Lee et al., 2021). Therefore, opinion leaders in the forum could be regarded as among the movement's informal leaders. The findings partly confirm our expectations. Despite the notion that informal leadership in networked social movements tends to be diffused, the analysis demonstrates that the social influence on LIHKG was highly concentrated. At the same time, there was no substantial difference in the overall degree of concentration of social influence between movement-related and non-movement-related discussions. The findings show that, regardless of the discussion topic, the presence of a very small number of extraordinarily influential individuals is a general pattern emerging from attention competition in online discussions (see Himelboim, 2011). One plausible interpretation is that, even in a networked social movement where people do not recognize central leaders, there is still a need for people to pay attention to the same few highly influential opinion leaders or else risk information overload.

However, consistent with our expectation, the analysis shows that the degree of instability in opinion leadership was significantly and substantially higher in movement discussions than in non-movement discussions. As explained in the conceptual section, this is because participants in a networked social movement tend not to recognize specific groups and individuals as central leaders. They are more ready to change who they are listening to as the movement evolves and the relevance of ideas from different people and groups change. The present study thus suggests that instability in opinion leadership, rather than overall degree of concentration of influence, is the more distinctive characteristic of a networked social movement.

Moreover, when examining the individual-level predictors of user influence, we found that the impact of membership seniority was weaker in movement than in non-movement discussions. Long-time members of a forum were expected to be more familiar with the culture of the forum and more recognized by other forum users, but the advantage

conferred by such existing social and cultural capital was weaker in a networked social movement when people were more willing to acknowledge everyone's capability to contribute.

Clearly, our findings show both similarities and differences between movement and non-movement discussions. The similarities – such as a high level of concentration of influence and similar predictors of opinion leadership at the individual level – show that online discussions, or at least those on LIHKG, do share certain basic characteristics regardless of the topic involved. They can also illustrate the point that even an apparently structureless and leaderless movement is not completely structureless and leaderless, when one understands 'leaders' in the broad sense of individuals having significant influence over others. Nonetheless, there are indeed significant differences between movement and non-movement discussions, and at least some of these differences can be understood in relation to the characteristics of networked social movements, as explicated in the previous paragraph.

Meanwhile, it has been noted that the Anti-ELAB Movement led to an explosion of discussions and a surge in numbers of users on LIHKG. One might question whether the pattern found in this analysis would appear whenever a sudden surge in new participants occurs in online discussions. However, our data suggest that, in the period under examination, the percentages of weekly new participants were actually consistently higher in non-movement discussions ($M_{non-movement}$ = 13.8% and $M_{movement}$ = 9.7%). In addition, while the number of new participants in movement discussions dropped significantly in the later months of 2019, the stabilization of opinion leadership in movement discussions was very slow and limited, and opinion leadership in movement discussions remained significantly more unstable than opinion leadership in non-movement discussions.

Beyond the main findings, we also saw that communication activities in the form of posting messages was particularly important in contributing to opinion leadership in movement-related discussions. One possibility is that frequent posters were particularly active in a type of communication activities that tended to attract more attention and responses online (e.g., sharing information about real-time happenings). Of course, we would need to conduct a content analysis of the posts in the online forum in order to ascertain whether the type of posts and content provided by frequent posters could indeed explain their specific popularity.

As noted at the beginning of the article, we believe that the analysis and findings have general implications on the understanding of informal leadership in networked social movements. Our findings can be seen as clarifying the meaning of the notion of 'leaderlessness' for networked social movements. Leaderlessness can first and foremost refer to the absence of central and formal leaders. However, there will inevitably be individuals and groups with more influence than others on the development of a movement. These are the informal and diffused leaders of the movement. Having said that, it is also important to note that informal leadership is unstable; that is, there is a significant degree of dispersion and instability over time in who exercises a greater influence on the movement and a tendency for leadership to be determined less by existing authority and credentials and more by ongoing communication activities.

Practically speaking, our findings suggest that political groups and individuals who want to exert influence on or even 'lead' a networked social movement should understand the opportunities and limitations involved. On the one hand, a wide range of people and groups can indeed exert extraordinary levels of influence on a networked social movement. On the other, as Castells (2012) has noted, maintaining one's leadership or influence is possible only if these groups and individuals continue to be responsive to the changing environment and to movement participants. In a networked social movement, anyone can try to contribute and 'lead,' but at the same time everyone should be ready to listen and 'be led.'

Limitations and future work

A few limitations of the current study must be acknowledged. First, our findings regarding the predictors of user influence are not comprehensive. After all, opinion leadership and user influence might be derived partly from the qualities of the opinions offered. According to Bennett et al. (2014), threads containing easy-to-personalize action frames are more likely to attract user attention, while Castells (2012) reports that emotional threads are more likely to trigger large-scale discussions. Future studies may test how personal characteristics, content-based factors, and other discussion dynamics could influence opinion leadership.

Second, the analysis focuses on LIHKG, an online forum with certain features that make it difficult for users to establish sustained opinion leadership. One might question whether our findings would be applicable to other social media platforms. Straightforward extrapolation of the findings to other platforms is of course problematic, and we have no intention of doing so. However, the results presented here are derived from the digital media platform that clearly stood out as the central communication platform in the Anti-ELAB Movement. They do reveal the characteristics of the informal leadership preferred by many movement supporters. In fact, it is possible that movement supporters were attracted to LIHKG precisely because of how it facilitated the kind of leaderless online discussion analyzed in this article. In any case, the conceptualization and operationalization of leadership instability could easily be incorporated into future studies on networked digital movements.

Third, this study focuses on the Anti-ELAB Movement in Hong Kong. Obviously, only additional studies of other cases can ascertain the generalizability of the current findings, but this article has pointed toward an approach to conceptualize and empirically examine informal and diffused leadership in networked social movements. We believe that similar analyses of informal leadership in other cases would significantly improve our understanding of networked social movements.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Hai Liang is an Assistant Professor at the School of Journalism and Communication at the Chinese University of Hong Kong. His research interests include computational social science, political communication, and public health.

Francis L.F. Lee is a Professor at the School of Journalism and Communication at the Chinese University of Hong Kong. He is the lead author of *Memories of Tiananmen: Politics and Processes of Collective Remembering in Hong Kong, 1989-2019* (Amsterdam University Press, 2021) and *Media and Protest Logics in the Digital Era: The Umbrella Movement in Hong Kong* (Oxford University Press, 2018).

ORCID

Hai Liang 🔾 http://orcid.org/0000-0003-1779-9552
Francis L.F. Lee 🔾 http://orcid.org/0000-0003-1587-4950

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