Digital media activities and mode of participation in a protest campaign: a study of the Umbrella Movement

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ABSTRACT

Although digital media are widely recognized as a predictor of protest participation and a platform for the coordination of connective actions, few studies have examined how digital media activities systematically relate to protesters' mode of participation in protest campaigns. This study aims at filling the research gap through analyzing the Umbrella Movement in Hong Kong. It identifies time spent in the occupied areas, participation leadership, and forms of actions undertaken as three aspects of a protester's mode of participation that can indicate a protester's degree of involvement in the movement. Analysis of a protester onsite survey shows that the protesters were active in four types of digital media activities: online expression, online debates, online explanatory activities, and mobile communication. Digital media activities are generally positively related to degree of involvement, but the four types of activities are also related to the three aspects of mode of participation differently. The findings illustrate how digital media activities are integrated into individualized mode of participation in contemporary connective actions.

Introduction

After 20 months of planning and debates, the beginning of 'Occupy Central' in Hong Kong was announced in the early morning of 28 September 2014, after days of student protests in front of the government headquarters. The occupation quickly attained a scale and scope much larger than expected after the police fired tear gas into the protesting crowd (Tang, 2015). The police action disrupted Occupy Central's original plan of being a highly disciplined and centralized form of collective action. Instead, the chaos created by the tear gas produced a window of opportunity for the participants to rewrite the 'script' of the actions through improvisation. Within 24 hours, the occupation spread to three other districts in the city. Occupy Central thus evolved into the Umbrella Movement.

The occupation lasted for 79 days. University-conducted polls have found that about 20% of Hong Kong adult citizens (i.e. about 1.2 million) claimed to have gone to the occupied areas to support the movement.[1] Even allowing for over-sampling of active citizens, it is safe to say that hundreds of thousands have joined the protest at some point. However, the activities constituting the Umbrella Movement were spatially and temporally

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extended. Hence the meaning of 'participation' can vary hugely across individuals. Some visited the occupied areas only a few times, while others camped in the areas. Individuals could have been more or less involved in various frontline actions, such as building street blockades and confronting the police. People could also organize small-group-based actions inside and outside the occupied areas, such as hanging huge iconic banners on buildings and hillsides around the city.

At the same time, the movement participants engaged in a wide range of digital media activities, ranging from changing Facebook profile pictures to show support to dispelling rumors about the movement. The Umbrella Movement thus involves the participants' construction of a space of autonomy (Castells, 2012) comprising both cyberspace and urban space. It also takes up the characteristics of connective actions (Bennett & Segerberg, 2013) as people were mobilized to take sometimes individualized forms of actions under the personal action frame of 'I Want Genuine Popular Election'.[2]

Nevertheless, given the multiple action possibilities, to what extent did the protesters engage in various forms of digital media activities? To what extent were the protesters 'active' in the occupied areas? How did digital media activities relate to participants' level of involvement and mode of participation in the movement?

This article tackles such questions. Many studies have argued that digital media, without being the sole 'cause' of large-scale movements such as Occupy Wall Street (OWS) and the Arab Spring, have played significant roles in the organization and coordination of such protests (e.g. Bennett & Segerberg, 2013; Castells, 2012; Ems, 2014; Howard & Hussain, 2013; Penney & Dadas, 2014; Salem, 2015; Tremayne, 2014). But few studies have mapped how individual-level variations in digital media activities are related to the ways individuals participate in the movement. We believe that mapping such relationships can further our understanding of how participants construct their way of participation in large-scale movements marked with the presence of connective actions.

The next section further discusses recent studies on the role of digital media in protest movements. The notion of mode of participation is then discussed, and research questions are set up. Data from a protester onsite survey are then analyzed.

Digital media in large-scale protest movements

Scholars have, over the past decade, pinpointed the myriad ways through which the Internet can contribute to social mobilization. The Internet provides the platforms for movement organizations to communicate with supporters and the general public (Atton, 2002; Forde, 2011; Hajek & Kabele, 2010; Stein, 2009), lowers the costs of coordination and facilitates transnational actions (Juris, 2005), and expands social movements' action repertoire (Earl & Kimport, 2011). The Internet also lowers the costs of information and participation for citizens (Coopman, 2011). In some cases, citizens unaffiliated with civic groups can 'self-mobilize' online to conduct offline protests (Harlow, 2012; Lee, 2015a).

Beyond seeing the Internet as a resource strengthening the power of existing civil society actors and mobilizing structures, some scholars have argued that social media have led to new movement formations. Bennett and Segerberg's (2013), in particular, articulated the concept of connective action to describe a form of protest movements not reliant on resourceful organizations at the center. Based on simple personal action frames and digital media serving as the communication infrastructure, large-scale

protest movements can emerge quickly with individuals and groups coordinating among themselves via digital media networks. These movements are capable of attracting huge numbers of participants partly because they do not require people to take up the same collective identity and engage in the same standardized forms of actions. They are decentralized, with many participants not mobilized by and not recognizing the 'authority' of the central organizers (Anduiza, Cristancho, & Sabucedo, 2014).

Some recent studies on the role of social media in large-scale protests have provided evidences in line with Bennett and Segerberg's (2013) conceptualization. For example, Tremayne (2014) examined Twitter discourses surrounding OWS in the two months before the first occupy action and showed how scale shift and frame alignment occurred. Eltantawy and Wiest's (2011) analysis of the Egyptian uprising concluded that social media 'provided swiftness in receiving and disseminating information; helped to build and strengthen ties among activists; and increased interaction among protesters and between protesters and the rest of the world' (p. 1218). Bennett, Segerberg, and Walker (2014) examined Twitter as a 'stitching platform' and the processes of production, curation, and dynamic integration which helped the organization and coordination of OWS (also see Kamel, 2014; Penney & Dadas, 2014).

While these studies have provided insights into how digital media activities can generate and coordinate large-scale protests, analysis of social media content or qualitative interviews with active participants cannot tell us how many people are using the digital media in what ways. This may lead to misjudgment about the significance of digital media activities in social movements. When actual digital media use is examined, the significance of social media is sometimes qualified. Aday et al. (2013), for instance, found that the audience of Twitter messages during the Arab Spring came mostly from outside the Arab region. Hence they argued that digital media's role resided mainly in communicating the situation of the Arab countries to the world. Similarly, Mercea's (2014) analysis of a protest in Moldova found that digital media did not really succeed in mobilizing people without much protest experience to join contentious actions. Digital media were mainly successful in mobilizing participation among experienced protesters unaffiliated with movement organizations.

Moreover, the extant literature on digital media and protest participation, including the aforementioned studies and more conventional survey-based studies (e.g. Krueger, 2006; Tang & Lee, 2013; Tufekci & Wilson, 2012; Valenzuela, 2013; Valenzuela, Arriagada, & Scherman, 2012), has rarely taken into account the variable meanings of participation in large-scale connective actions. The mobilizing information contained in a message transmitted via Twitter or Facebook may facilitate people to 'join a protest' in the general sense, but could it encourage people to participate in undertaking the more conflictive or high-risk actions (if there is any)? Is digital media use related to not only whether, but also how, one participates in a protest?

The premise of our analysis in this article is that participants in a protest movement vary in terms of their degrees and types of digital media activities as well as their levels of involvement and modes of participation in a movement, and these variations may relate systematically to each other. The premise is probably non-controversial or even somewhat intuitive. Our contention is that analyzing the systematic relationships among digital media activities and mode of participation is a way for us to understand

how individual citizens can selectively construct their own ways of participation in a movement.

Mode of participation in the Umbrella Movement

Political scientists typically use the term mode of participation to refer to the different types of activities that can be undertaken by citizens to influence politics (van Deth, 2014; Verba & Nie, 1972). Our use of the term is both narrower and broader than the conventional usage. On the one hand, we are concerned with mode of participation within a single protest movement. But on the other hand, we are not concerned merely with types of activities. In a spatially and temporally extended protest movement, 'participation' can vary substantially along numerous dimensions, ranging from the amount of time spent on movement activities to whether one participated in the movement activities alone or with one's friends.

Of course, it is neither possible nor necessary to examine in one study all possible dimensions of a protester's mode of participation. Focusing on the Umbrella Movement and based on our analytical interest, this study focuses on three dimensions: amount of time spent in the occupied areas, participatory leadership, and forms of actions undertaken. We focus on these three dimensions because they are all related to a participant's level of involvement in the movement, that is, participants who have spent more time in the occupied areas, who have taken up the role of participatory leadership, and who have undertaken a wider range of actions can be considered as more deeply involved.

Specifically, while the Umbrella Movement involved continual street occupation for 79 days, not all participants could be present at the occupied sites for long periods of time every day. Time is a scarce resource in people's daily lives. Hence, amount of time spent can be an indicator of an individual's commitment to the cause, though people's capability to spend time on protests is also shaped by their biographical availability, that is, the presence or absence of personal constraints in daily lives (McAdam, 1986; Schussmann & Soule, 2005).

Participation leadership refers to whether a participant has taken up the role of a leader in the process of social mobilization behind a protest movement. Social mobilization unfolds over time. In the process, individual citizens can take up a leading role by making an early decision to participate and calling upon others to join (Lee & Chan, 2015). Participation leaders do not have to be formal members of movement organizations, though people who are more closely connected with movement groups are probably more likely to be participation leaders. Similar to the notion of opinion leaders in public opinion research (Katz & Lazarsfeld, 1957; Weimann, 1991), participation leaders are ordinary people who exert influence on others around them. In this study, participation leadership is indicated by whether a participant has called upon others to join the Umbrella Movement.

A large-scale and extended protest movement typically consists of a range of more specific activities in which movement participants may be more or less active. Milkman, Luce, and Lewis's (2013) study of OWS participants, for instance, found that 10.3% of them had lived in an Occupy camp, about one-third had participated in a working group, and more than 60% had attended a General Assembly meeting. But this also means that a substantial proportion might not have joined any of these activities. For

parsimony and to render the analysis more conceptually meaningful, this study focuses on two types of actions, namely frontline activism and support provision. The occupation during the Umbrella Movement was illegal and faced constant challenges from the police and counter-protesters; hence there was a range of frontline actions, such as building blockades, confronting the police, handling the counter-protests, that required the participation of the occupiers. Meanwhile, people might also provide other kinds of 'background support' for the movement, such as by donating money and other resources or by organizing activities to give moral and symbolic support. Frontline activism and support provision may not capture all activities within the Umbrella Movement, but they constitute two useful concepts for the present analysis.

Research questions and hypotheses

While the previous section identified the dimensions of mode of participation to be examined, we adopt a bottom-up approach in identifying types of digital media activities. While one needs to identify the dimensions of mode of participation to study when designing the survey questions, it is possible and more appropriate to ask the protesters about their engagement in a range of digital media activities that are prevalent in a movement and then discern whether the activities could be classified into types through an exploratory analysis.

The first two research questions are simply descriptive ones:

Q1: To what extent did the Umbrella Movement participants engage in a range of digital media activities? Can the digital media activities be empirically classified into types?
Q2: How much time did the Umbrella Movement participants spend in the occupied areas? To what extent did they take up the role of participation leader and engage in frontline activism and support provision?

The analysis will then examine the relationships between the two sets of factors. As noted earlier, the dimensions of mode of participation examined in this study – time spent in the occupied areas, participation leadership, and participation in the two types of actions – can all be considered as indicators of level of involvement in the Umbrella Movement. Hence we can posit an overall hypothesis that the more involved participants have also engaged in various types of digital media activities more frequently.

This hypothesis is partly based on the literature's recognition of the general importance of digital media in large-scale protests. Besides, there are more specific reasons for digital media activities to relate positively to the dimensions of mode of participation being examined. First, digital and mobile media should be especially important to those who camped in the occupied areas, partly because these participants might not have ready access to conventional mass media (except through digital and mobile devices). Second, many of the most widely used social media and mobile apps in Hong Kong are platforms for interpersonal communications. People who called upon their friends to participate were likely to be those active in the digital media arena. Third, many frontline actions, such as facing the counter-protesters, were unplanned activities requiring real-time mobilization and coordination, and digital media were likely to have played a role in such processes. Fourth, although support provision does not require real-time coordination, digital media could still be channels of information crucial for people to join such actions.

For clarity, the general hypothesis can be stated as follows:

H1: Among the participants, degree of digital media activities relates positively to level of involvement in the movement, i.e. to more time spent in the occupied areas, participation leadership, engagement in frontline actions, and engagement in support provision activities.

Nevertheless, besides being indicators of level of involvement, the dimensions of mode of participation being examined also differ from each other substantively because the requirement and conditions pertinent to each dimension may vary. As a result, the various dimensions may relate to different types of digital media activities. Frontline actions, for instance, require real-time coordination, and hence mobile communication may be particularly important for frontline activism. Mobilizing others to join the movement, in contrast may depend more on the participants' willingness to talk to and persuade 'bystanders' of the movement. Hence it may relate more strongly to digital media communications that involve people talking to non-supporters.

More generally speaking, as suggested by studies about other occupation movements around the world, different types of digital media activities or platforms, due to their varying affordances, may be more or less utilized for different purposes (Haciyakupoglu & Zhang, 2015). Meanwhile, individual participants may utilize digital and social media in specific ways so as to take up specific roles within the movement (Boler, MacDonald, Nitsou, & Harris, 2014). Therefore, systematic relationships between types of digital media activities and the various dimensions of mode of participation may arise as individuals proactively construct their own ways of participating in a movement through using digital and social media in specific ways.

Given the above considerations, a research question is posed as follows:

Q3: Do the different types of digital media activities relate to the various dimensions of the protesters' mode of participation differently?

The present analysis does not heavily rely on assumptions about causal directions, though we believe that digital media activities and the dimensions of mode of participation examined in this study are most likely to be mutually reinforcing. Our primary interests are the systematic associations among the variables, which can be taken as signs of how digital media activities are tied to specific ways of participating in the Umbrella Movement.

Survey method and data

Data analyzed below were derived from a survey of Umbrella Movement participants conducted in two occupied areas – Admiralty and Mong Kok (MK hereafter) – on 2 November, Sunday, that is, about five weeks after the beginning of the occupation. The sampling method followed past studies in Hong Kong (Lee & Chan, 2011) and other countries (Milkman, Luce, & Lewis, 2013). Interviewers worked in pairs, walked around the occupied areas in a designated path and invited every 10th person they walked past to be a respondent. This procedure attempts to derive something approaching a probability sample using the temporal and spatial distribution of the protesters as the sampling frame.

The interviewees filled out the questionnaires by themselves. The survey fieldwork started in late afternoon and lasted for about four hours. The MK and Admiralty fieldwork

received 296 and 273 completed questionnaires respectively, yielding a total sample of 569 respondents. The response rate was 95%.

Among the 569 respondents, 59.5% were males; 61.3% had college or university education, but only 19.8% were current university students; 48.0% aged 25 or below, while 37.7% aged between 26 and 40. Nearly half (47.9%) of the respondents claimed that they belonged to the middle class, 45.7% claimed that they belonged to the lower class, and only 6.3% claimed that they belonged to the upper class. The respondents from the two occupied areas did not differ significantly in age distribution. But the MK occupiers were more likely than the Admiralty respondents to be male (69.8% vs. 48.5%), current college students (23.1% vs. 16.2%), and belonging to the lower class (50.8% vs. 40.4%). The differences between the participants in MK and Admiralty point to the significance of urban space in shaping the occupation movement.[3]

The above figures also suggest that sample representativeness is a complicated issue because the profile of the protesters actually varied somewhat between the occupied areas. In fact, protester profiles might also vary between weekdays and weekends, between different time points on a day, and between periods during the 79-day occupation. But with the caveats kept in mind, the sample should be representative of at least the protesters in the two occupied areas on the day of the survey fieldwork.

Analysis and results

Digital media activities

Pertinent to *Q1*, the survey included 21 items asking the respondents to report, using a three-point scale (1 = no, 2 = yes but not frequently; 3 = yes and frequently), their engagement in a range of digital media activities. Right from the beginning of the movement, digital media have become a platform for the spread of rumors, such as actions of the People's Liberation Army, chaotic scenes in the occupied area, etc. As Table 1 shows, 95% of the respondents had encountered rumors about the movement online, and 55% had encountered rumors frequently. The situation triggered the movement supporters' collective efforts to dispel rumors. Facebook pages such as 'Occupy Central Myth Killer' and 'Myth Terminator' were established to collect rumor-dispelling information. Former journalists wrote articles about rumor detection. Others could help dispel rumors by contributing information or simply forwarding the information and materials. As Table 1 shows, 80% of the participants had tried to refute rumors, with more than 30% doing it frequently.

Digital media were also a platform for debates about the merits and demerits of the movement. Nearly 90% of the respondents had encountered anti-occupation views from acquaintances or strangers, and more than 40% had encountered such opinions frequently. Nearly 80% had responded to opposite opinions from friends, and nearly 30% had done so frequently. Meanwhile, about half of the respondents had responded to anti-occupation views from strangers. The widespread occurrence of heated debates among friends also led to unprecedented discussions about 'unfriending' people on social media. Yet the proportion of participants who had actually unfriended people was not large.

Table 1. Participants' engagement in movement-related digital media activities.

	% yes	Factor 1	Factor 2	Factor 3	Factor 4
Exposed to rumor	55.0 (95.0)		0.54		
Try to refute rumor	31.8 (80.8)		0.44		
Exposed to anti-occupation views from acquaintances	41.9 (89.3)		0.73		
Exposed to anti-occupation views from strangers	40.8 (86.0)		0.76		
Respond to anti-occupation views of acquaintances	29.6 (77.5)		0.70		
Respond to anti-occupation views of strangers	14.2 (52.8)		0.53		
Unfriend people	6.0 (29.2)			0.44	
Change one's profile picture	56.1 (70.5)	0.45			
Show pictures and videos taken in the occupied areas	40.9 (78.1)	0.54			
Show pictures made by oneself	11.2 (27.0)			0.60	
Publish commentaries	17.7 (54.8)	0.53			
Public brief personal reflections	31.2 (80.9)	0.66			
Forward news & comments From mass media	46.0 (84.2)	0.84			
Forward online commentaries	40.3 (80.2)	0.86			
Forward photos, pictures, and videos made by friends	30.4 (71.6)	0.70			
Forward articles written by friends	25.7 (64.5)	0.68			
Explain to foreign friends	17.2 (57.3)			0.63	
Explain to mainland friends	11.2 (40.7)			0.74	
Forward info. via mobile phones	36.8 (81.1)				0.72
Discuss the movement with friends via mobile phones	38.7 (83.4)				0.79
Set up mobile chat groups to discuss the movement	19.3 (46.8)				0.76
Squared loadings		5.53	3.73	2.96	3.23

Notes: Entries are percentages answering 'yes and frequently', while the bracketed numbers refer to the total percentages answering 'yes'. Factor analysis adopts oblique rotation and principle component analysis. Factor loadings smaller than 0.35 are not shown.

No matter whether people debated with others, social media are expressive spaces. About 70% of the respondents had changed profile pictures to show support. People also could publish their thoughts, feelings, and observations in various ways, ranging from a simple status update to a carefully edited video. As Table 1 shows, the protesters engaged in expressive activities frequently. About 78% had shown pictures or videos taken in the occupied areas, and nearly 40% had done that frequently. About 80% had published brief personal reflections, and around 30% had done that frequently. The percentages of people engaging in more elaborate forms of expressions are understandably smaller. But still, more than half of the respondents had published commentaries about the movement online, and about 25% had shown self-made pictures or graphics online.

While many scholars have commented on the rise of the prosumer or produser (Bruns, 2008), others have noted that most people would not engage in elaborate original content production (van Dijck, 2009). What many people would do is to forward and transmit messages and materials produced by others or from conventional mass media. The findings from our survey are consistent with such views. More than 80% had forwarded news and commentaries from the mass media, whereas 45% had done so frequently. About 80% had forwarded online commentaries about the movement. About 70% had forwarded photos, pictures, and videos made by friends, and about 60% had forwarded articles written by friends about the movement.

The Umbrella Movement had attracted much attention of the international media. But within each foreign country, the amount of information carried by various media outlets can still be uneven (e.g. Sparks, 2015). Meanwhile, information about the Umbrella Movement was largely blocked in China. In this context, movement participants might help explain to people in foreign countries or mainland China the background, aims, and development of the movement. More than half of the respondents had explained the movement to friends in foreign countries, while about 17% had done that frequently. About 40% had explained to friends in mainland China, with slightly more than 10% having done so frequently.

Lastly, the survey included three questions specifically referring to the use of mobile devices. More than 80% of the respondents had forwarded movement-related information via mobile phones, and more than one-third had done so frequently. The percentages who had discussed the movement with friends via mobile phones were largely the same. More than 40% had set up mobile chat groups for discussing the movement.

Overall speaking, the protesters had actively engaged in a wide range of movement-related digital media activities. To prepare for further analysis and to answer the second part of *Q1*, an exploratory factor analysis was conducted to see if the items could be classified into distinctive types. Four clean factors emerge, as the second to fifth columns of Table 1 show. The first factor can be labeled online expression. Eight items are primarily loaded on this factor: changing one's profile picture to show support, publishing pictures or videos taken on the site, publishing commentaries, publishing brief personal reflections, forwarding news and commentaries from the mass media, forwarding online commentaries, forwarding photos, videos, or re-created pictures produced by friends, and forwarding articles written by friends. The second factor is consisted of the first six items in Table 1, that is, exposing and responding to rumors and anti-occupation opinions shared by friends or strangers. The factor can be labeled online debate because the items involve people's exposure and responses to information and messages against the movement.

The third factor is consisted of publishing pictures or re-created graphics produced by oneself, explaining to foreign friends about the movement and the situation in Hong Kong, explaining to friends in the mainland about the movement and the situation in Hong Kong, and unfriending people who have views different from oneself. The two items about explaining the movement to people outside Hong Kong have the highest loadings. Therefore, the factor can be labeled online explanatory activity. The last factor is consisted of the three items on mobile phone usage and therefore can be labeled mobile communication.

Four indices were created by averaging the pertinent items.[4] Not surprisingly, the four indices are all significantly positively related to each other. The bivariate correlations range

from $r = 0.31$ between mobile communication and online explanatory activity to $r = 0.55$ between online expression and online explanatory activity. But the four types of digital media activities remain conceptually and empirically distinct.

Mode of participation

Q2 asks about the amount of time the participants spent in the occupied areas, whether they have mobilized others to act, and their participation in frontline activism and support provision. The survey included three items related to time spent in the occupied areas. First, respondents were asked the number of days they visited the occupied areas. As Table 2 shows, 12.3% answered 'every day', while 48.3% claimed that they had spent more than 14 days in the occupied areas. Second, the respondents were asked the amount of time they spent in the occupied areas per 'visiting-day'. Only 6.7% claimed that they would spend more than 15 hours per visiting-day. More than half spent five hours or fewer per visiting-day. Third, the respondents were asked if they had ever stayed overnight. Nearly 60% replied affirmatively.

These figures suggest that the average participant in the sample had an arguably 'medium' level of involvement in terms of time spent, for example, most participants neither stayed in the occupied areas every day nor visited the areas only a few times. For later multivariate analyses, an index of time spent in the occupied areas was created by averaging the respondents' standardized scores on the three items ($M = 0.05$, S.D. = 0.73, $\alpha = 0.67$).

For participation leadership, the survey asked the respondents whether 'they have proactively invited other people to participate in the movement'. Only 22.5% answered 'never', 34.8% did it 'once or twice', and 42.7% did it 'many times'. A substantial proportion of the participants did attempt to mobilize others to act.

The questionnaire contains nine items asking the respondents if they had, since the beginning of the occupation: (1) joined discussions about the strategies and direction of

Table 2. Time spent in the occupied areas and participation leadership.

Number of days spent in occupied area	
1 day	2.1%
2–3 days	6.7%
4–7 days	14.1%
8–14 days	15.6%
>14 days	48.3%
Everyday	12.3%
Time spent in the occupied area per day	
≤2 hours	13.7%
3–5 hours	42.0%
6–10 hours	29.5%
11–15 hours	6.3%
>15 hours	6.7%
Stayed overnight	
Yes	58.0%
No	41.3%
Did you mobilize others to join?	
No	22.5%
Once or twice	34.8%
More than twice	42.7%

Notes: Percentages do not add up to 100% because of missing values and do not know answers.

the movement in the occupied areas, (2) participated in maintaining order or delivering materials at the occupation sites, (3) attended 'civic lectures' or other seminars held within the occupied areas, (4) helped set up blockades, (5) helped handle the anti-occupation protesters, (6) participated in protecting the occupied areas when police took action, (7) donated material resources to the movement or participants, (8) donated money, and (9) participated in actions outside the occupied areas to express support toward the movement.

Answers were simply yes or no. As Table 3 shows, more than two-thirds of the respondents had donated material resources (67.1%). Nearly 60% had participated in the maintenance of order or delivery of materials. An equally high proportion had helped protect the occupied areas when police took actions. More than 40% had joined discussions about movement directions and strategies and helped handle counter-protesters. These findings illustrate a high level of participation in various frontline actions by the protesters.

Notably, the first six items refer to activities within the occupied areas, whereas the last three items referred to supportive actions that did not necessarily occur within the occupied areas. The items were put into an exploratory factor analysis. Two clean factors indeed emerged. Except attending civic lectures, the five actions that took place within the occupied areas formed one factor, while attending civic lectures and the last three items constituted a second factor. The results provide empirical validation for the conceptual distinction between frontline activism and support provision. A 0–5 index was created by summing the five items belonging to frontline activism ($M = 2.38$, S.D. = 1.78, $\alpha = 0.78$), and a 0–4 index for support provision was likewise created ($M = 1.89$, S.D. = 1.06, $\alpha = 0.37$).[5] The two indices are correlated at $r = .35$ ($p < .001$), that is, people who were active in frontline activism were also more active in support provision. But the correlation was not overwhelmingly strong, suggesting that many protesters could have been active in only one form of actions.

Predicting the dimensions of mode of participation

We can now examine the relationships between digital media activities and mode of participation. We present the results of both bivariate correlational and multiple regression

Table 3. Levels of participation in frontline activism and support provision among the protesters.

	% participated	Communality	Frontline action	Support provision
Join discussion about movement directions and strategies	44.3	0.45	0.61	
Join the delivery of materials or maintaining order	58.0	0.53	0.59	
Attend civic lectures or seminars	57.1	0.20		0.45
Set up the blockade	32.5	0.58	0.79	
Handle the anti-occupation protesters	45.0	0.59	0.79	
Help protect the occupied areas when police take actions	58.2	0.59	0.79	
Donate material resources	67.1	0.53		0.70
Donate money	12.0	0.25		0.50
Participated in actions outside the occupied areas to support the movement	52.7	0.39		0.63
Eigen-values			2.95	1.15
% of variance explained			32.77	12.82

Notes: The first column shows the percentages of protesters who have participated in the form of action. The entries in the last two column are factor loadings on the pattern matrix. Loadings smaller than 0.35 are not shown.

analyses. The regression model includes age, gender, education, self-reported socio-economic status, and a dichotomous variable representing whether the protester was in Admiralty or MK. The core predictor variables are the four digital media activities indices. In addition, two variables about perceived importance of media as sources of movement information were included. Perceived importance of digital media was the average of the respondents' perceived importance, registered by a five-point Likert scale, of 11 digital media platforms such as Facebook, Whatsapp, Twitter, a couple of online alternative media sites in Hong Kong, whereas perceived importance of mass media was the average of perceived importance of television live coverage, television news, newspapers, and radio.[6] Time spent in the occupied areas was also included as an independent variable when predicting participation leadership, frontline activism, and support provision.

Table 4 summarizes the results. The first column shows that, at the bivariate level, younger participants, less-educated participants, and males had spent more time in the occupied areas. All four types of digital media activities and perceived importance of digital media as a source of movement information are positively related to time spent in the occupied areas, while perceived importance of mass media is related negatively to time spent in the occupied areas. However, in the multiple regression, only education, mobile communication activities, and perceived importance of mass media are significantly related to the dependent variable. In other words, mobile communication is the type of digital media activities relating to time spent in the occupied areas in the most robust manner. Besides, participants who had spent more time in the occupied areas perceived the mass media as less important as a source of movement information.

Regarding participation leadership, younger participants were substantially more likely to have mobilized others. Not surprisingly, time spent in the occupied areas positively relates to participation leadership. All four types of digital media activities and perceived importance of digital media are related to participation leadership positively at the bivariate level. But in the regression model, only engaging in online debate and mobile communication are positively related to likelihood of having mobilized others.

Frontline activism is very strongly related to time spent in the occupied areas, while men were more likely than women to have participated in frontline activism. Again, at the bivariate level, all digital-media-related variables are significantly related to the dependent variable. In regression, online explanatory activity, mobile communications, and perceived importance of digital media as information source are significantly related to participation in frontline activism.

Lastly, younger participants and participants in Admiralty were more likely to have participated in support provision, though age does not significantly predict support provision in the multivariate analysis. All four types of digital media activities and perceived importance of digital media relate positively and significantly to support provision at the bivariate level. This time, online explanatory activity and online debate retain their significant relationship with the dependent variable in regression. Interestingly, perceived importance of mass media also relates positively to support provision.

In sum, all digital-media-related variables relate positively at the bivariate level to all dimensions of mode of participation examined in this study, and in the regression analysis at least one of the four types of digital media activities retains a positive relationship with each of the dependent variables. The findings thus support *H1*, that is, generally speaking,

Table 4. Predicting aspects of modes of participation.

	Time spent in area		Participation leadership		Frontline activism		Support provision	
	Bivariate	Regression	Bivariate	Regression	Bivariate	Regression	Bivariate	Regression
Gender (1 = Female)	−.10*	−.08	.06	.07	−.21***	−.13***	−.02	−.03
Age	−.11*	−.04	−.29***	−.20***	−.11***	−.00	−.11*	−.03
Education	−.13**	−.15***	.00	−.01	−.07	.01	−.01	.04
SES	−.06	−.07	−.02	−.01	−.05	−.04	.01	.01
Area (1 = MK)	.07	.08	.02	.03	.13**	.06	−.09*	−.10*
Time spent			.19***	.10**	.64***	.56***	.27***	.22***
Digital media activities								
Online expression	.21***	.05	.27***	.08	.26***	−.03	.27***	.07
Online debate	.15***	−.00	.27***	.11*	.23***	.02	.30***	.16***
Online explanatory acts	.16***	.07	.19***	.05	.27***	.12***	.25***	.10*
Mobile communication	.26***	.21***	.30***	.12*	.35***	.15***	.27***	.07
Perceived importance of								
Digital media	.08*	.01	.13**	.00	.22***	.11**	.12**	−.04
Mass media	−.11**	−.11*	.01	.04	.08	−.03	.12**	.15***
Adjusted R^2		.112***		.160***		.487***		.178***

Notes: Entries are Pearson r coefficients and standardized regression coefficients. Missing values were replaced by means. $N = 569$ for the regression analysis.
*$p < .05$.
**$p < .01$.
***$p < .001$.

participants who engaged in movement-related digital media activities were more deeply involved in the movement.

But at the same time, in the regression analysis, not every type of digital media activities relates significantly to each dimension of mode of participation. In relation to Q3, there are signs showing that the various types of digital media activities relate to the different dimensions of mode of participation differently. Online expression does not relate to any dimension in Table 4 in the multivariate context. Mobile communication seems to relate to frontline activism, time spent in the areas, and participation leadership more strongly, while online debate relates substantially to support provision and participation leadership. Admittedly, given the interconnections among the four types of digital media activities, the differential implications of the four types of activities may not be clear-cut and robust. But the seeming differential implications of mobile communication and online debate are actually explicable, as discussed in the concluding section.

Concluding discussion

The above analysis revealed the extent of the Umbrella Movement participants' digital media activities. Some of the activities were primarily about showing support. Yet some were indeed important parts of the movement dynamics. One example is the collective efforts to dispel rumor. It was widely believed that many rumors were spread by the movement's opponents to delegitimize the movement. The rumor-dispelling efforts were crucial in maintaining the movement's momentum, credibility, and public support.

The digital media activities are therefore significant in extending participation from the physical urban space of the occupied areas to cyberspace, and in the process creating a space of autonomy (Castells, 2012). Due to limitations of their 'biographical availability' (McAdam, 1986) or other reasons, not all participants could have stayed in the occupied areas overnight or for long periods of time every day. The digital media activities allowed participants to continue to be part of the movement even when they were not physically present in the occupied areas.

Our analysis of mode of participation has focused on a number of dimensions that could be considered as indicators of level of involvement. The results show that movement participants who engaged in digital media activities more frequently were involved in the movement more deeply: they spent more time in the occupied areas, were more likely to have mobilized others to participate, and were more active in both frontline activism and support provision. This finding is consistent with the idea that digital media and connective actions have empowered protest movements (Bennett & Segerberg, 2013). The empowering effect of digital media and connective actions is often understood in terms of how they facilitate more effective mobilization and maximize people's likelihood to act by allowing a wider range of action opportunities. This study shows that the empowering effect of digital media can also be realized through deepening the participants' involvement.

Of course, the cross-sectional survey could not demonstrate the causal effects of digital media use on involvement, but it is very unlikely that the causal influence in the relationship between digital media activities and involvement would flow in only one direction instead of having the two mutually reinforcing each other.

Beyond the generally positive relationship between digital media activities and level of involvement, this article is even more interested in whether different types of digital media activities may relate to the protesters' mode of participation differently. To the extent that the various types of digital media activities (as well as different dimensions of mode of participation) are positively correlated among themselves, the differential implications of different types of digital media activities may not be clear-cut. But there are signs showing that mobile communication is particularly significantly related to time spent in the occupied areas and frontline activism. This is understandable. Frontline activism in the Umbrella Movement often relied on real-time coordination and sometimes involved improvisatory acts. Mobile communication, especially through chat applications, was particularly suitable for the purpose of coordination of such real-time actions. Besides, it is possible that participants who spent a huge amount of time in the occupied areas were reliant on mobile communication to stay in touch with others and to gain immediate knowledge about happenings both inside and outside the occupied areas. This finding is also consistent with Haciyakupoglu and Zhang's (2015) study of the Gezi protests in Turkey, which found that participants relied particularly on Whatsapp for circulating messages among friends when they were in the field.

Different from mobile communication, engagement in online debate was more strongly related to participation leadership and support provision. This pattern also makes conceptual sense. Online debate requires participants to engage discursively with disagreeing others. Participation leadership, similarly, requires participants to engage discursively with people who are not necessarily movement supporters. When one tries to mobilize others, one may need to try to convince others about the legitimacy of the movement, and people who often debate with movement opponents should be better prepared to do so. Similarly, one important item in the support provision index is support activities outside the occupied areas (and this is the item most strongly related to online debate when the four items belonging to the index were treated separately). Once the participants go outside the occupied areas, they may need to be prepared to engage discursively with people holding different views. Support provision thus also partly draws upon a willingness and ability to engage discursively with others.

The findings also suggest that not all types of digital media activities are equally powerfully tied to involvement in the movement. Online expression does not relate significantly to any of the four dependent variables in the regression analysis. Online expression, when compared to online debates and explanatory activities, requires the least mental efforts – this is not to say that online expression cannot involve significant mental efforts; it is only to say that simple expressive activities, such as a simple status update or sharing a commentary article, does not *require* much effort.

On one hand, this finding seems to be consistent with the argument that online action can be a form of slacktivism (Gladwell, 2010). Mere online expression should not be equated with actual participation in the physical actions that constitute the core of a movement or protest campaign. But on the other hand, it should be noted that online expression is positively related to the three other types of digital media activities, and online expression does relate to involvement in the movement at the bivariate level. Therefore, while the finding cautions against the attribution of too much power and significance to mere online expression, online expression should not be completely dismissed because

it is after all often part of a cluster of digital and offline practices that movement participants engage in.

Overall, the findings suggest how digital media activities can be tied to or embedded into distinctive forms of engagement in the movement at large. The 'casual participants' (Mercea, 2014) might have engaged mainly in online expression and have maintained a relatively low level of involvement. Participants more willing to engage with disagreeing others were more active in online debates, interpersonal mobilization, and supportive activities outside the occupied areas. Participants most active in the frontline and spent a huge amount of time in the occupied areas were more reliant on mobile communication.

These findings and interpretations thus also suggest the possibility for individual participants to selectively engage in digital media activities and construct their own distinctive forms of participation in the movement. Studies on other occupation movements based on in-depth interviews have begun to analyze how individuals take up specific roles within through their strategic use of digital and social media (Boler et al., 2014; Haciyakupoglu & Zhang, 2015). This study suggests that usage of digital and social media are not idiosyncratic; there can be recognizable patterns of how digital media activities relate to specific ways people engage in an occupation movement.

Certainly, this study is only a first step toward systematically analyzing the implications of digital media activities on protesters' mode of participation in a social movement. Future research can examine the problematic areas in other cases. Moreover, both the typology of digital media activities and the dimensions of mode of participation can be further refined and/or developed. For instance, this study focuses on frontline activism and support provision as two forms of actions. But it leaves out what can be labeled 'community building' activities, which, in the case of the Umbrella Movement, include activities such as practices of public arts and setting up of community spaces such as self-study area and temporary temples. These activities involve the participants constructing their 'lifeworld' within the occupied areas according to their imaginations of the ideal community, and it is worth examining how such community building activities relate to digital media use. Beyond typologies and patterns of relationships that can be derived through quantitative studies, qualitative studies can also be conducted to examine how individual protesters selectively and strategically tie their digital media activities to offline actions.

Lastly and beyond digital media, it is also worth noting that, in the present analysis, perceived importance of mass media is positively related to participation in support provision. As just noted, many of the support provision activities are not actions inside the occupied areas. The finding suggests that, while actions and activities – especially the ad hoc frontline actions – can be reliant on digital media platforms for coordination and mobilization, the mainstream media can play a role in generating actions beyond the occupied areas. As many scholars have noted, mainstream news media and digital media are not disconnected and contrasting systems (Chadwick, 2011). Rather, at least in societies where the mainstream news media have a minimal degree of autonomy, the mainstream news media and digital media are likely to form into an intertwined media and communication system, and they can be playing different and yet supplementary roles in social mobilization (Skoric & Poor, 2013). Future studies can also examine the integration of digital media activities and mass media consumption by individual participants in large-scale social movements.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. A Hong Kong University opinion poll conducted between 20 and 23 October 2014 found that 18% of the respondents claimed to have participated in the movement, while a survey conducted by the Chinese University of Hong Kong between 8 and 12 December 2014 found that 20.1% of the respondents have participated.
2. The Umbrella Movement should not be seen as a prototypical case of networked social movement or crowd-enabled connective actions, however, because central organizers did exist, and the movement was programmatic and cannot be understood without referring to the plan of 'Occupy Central' since early 2013 (Lee, 2015b).
3. Admiralty is a financial district marked with high-rise business buildings and five-star hotels, whereas MK is a grassroots residential area. Part of the differences in the characteristics of the participants and the atmosphere in the two areas arguably reflect the differences between the two districts.
4. The Cronbach's alphas are 0.87 for online expressions, 0.75 for online debates, 0.61 for online explanatory activities, and 0.79 for mobile communication.
5. The low alpha value for the index means that the participation in the four activities constituting the index actually do not strongly correlate with each other. The index was created nonetheless on the basis of conceptualization and the results of the factor analysis.
6. The Cronbach's alphas are 0.83 and 0.86 for perceived importance of digital media and perceived importance of mass media, respectively.

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