Social Media Activity and Hyperlink Network Analysis: 
A Holistic Media Ecology Perspective

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Abstract
This study examines a hyperlink network among non-governmental organizations (NGOs) in China. Using social media activity, indicated by the presence of a profile, length of time since social media adoption, number of accounts followed, and number of posts, we investigate NGOs’ hyperlinking behaviors from a holistic media ecology perspective. Drawing from homophily and resource dependence theory, this research aims to understand NGOs’ hyperlink networks from their social media activity. Four findings emerge from our study. First, hyperlink networks interact with social media activities. Second, hyperlink networks are shaped by both homophily and resource dependence. However, resource dependence theory better explains hyperlink networks. Third, in line with cohort effects, length of time since social media adoption matters for hyperlink network; early social media adopters were more likely to hyperlink to early adopters. Fourth, the number of posts is a better activity predictor for NGOs’ hyperlink networks than number of accounts followed.

1. Introduction
In recent years, social media has become a significant source for information sharing [1], social engagement, and community action [2]. As such, non-governmental organizations (NGOs) have recognized the significance of social media, such as Facebook and Twitter, to deliver information, build community, engage with stakeholders, and mobilize actions [3-5]. In China, Weibo (micro-blog) is a popular information source and civic engagement platform. The current research examines Chinese NGOs’ use of Weibo and relies on Khagram and colleagues’ [6] definition of NGOs as “nonprofit groups whose primary aim is to influence publicly some form of social change” to characterize them (p. 6). NGOs in China are not necessarily private or voluntary, as many of them are government-organized NGOs (GONGOs) [7].

At the same time that social media has emerged as a popular vehicle for NGOs to communicate with publics, researchers have embarked on the study of organizations’ online behavior, including social media use and hyperlinking. These studies have generally examined organizational behavior on social media or their own websites (i.e., hyperlinking) independently. However, hyperlink networks are not isolated and closed systems, but rather, they interact with other systems, such as offline dynamics [8] and traditional mass media systems [9-11]. As such, hyperlink network theorizing has not kept pace with the increasing changes in the NGO sector and the new media environment. As various new media platforms emerge, how social media interacts with hyperlink networks remains largely unknown. To fill this research gap, the current research seeks to understand the interaction between NGOs’ hyperlink networks and their social media activity. From a media ecology perspective, the underlying rationale for using social media activity to predict hyperlinking behaviors is that different media systems form an organic holistic media eco-system [12]. Thus, different media systems, such as mass media, websites, and social media, are closely connected.

The purpose of this study is to examine the influence of NGOs’ social media activity on hyperlink networks. This research seeks to answer a simple question: Does NGOs’ social media activities affect their hyperlink networks? In this study, the social media activity characteristics examined are (a) the presence of a social media profile, (b) length of time since social media adoption, (c) number of accounts followed, and (d) number of posts.

2. Holistic media presence
Social media and websites have become significant platforms for NGOs to manage their public presence [13]. Drawing from media ecology theory [12, 14], an organization’s public presence across mass media, websites, and social media is an open and closely connected system. Organizational websites and social
media presence are all part of the organization’s integrated Web presence. In other words, websites and different types of social networking sites are closely connected as extensions of one another and social media is additive rather than a competitive alternative. For example, as Rybalko and Seltzer [15] argue, the various profiles that organizations have on different social networking sites should be perceived a unified organizational social media presence. Previous scholarship demonstrates that website influence is related to the number of followers on micro-blogs (Kwak et al., 2010). In addition, website longevity and reach predict social media usage and adoption (Nah & Saxton, 2013), which suggests that different online systems are essentially interrelated.

To foster a positive organizational image and brand reputation, organizations must consistently and strategically manage their presence across various media platforms. Hyperlinks are one element that must be managed, as they are considered as the central feature of the Internet and websites [16]. A hyperlink is “a technological capability that enables one specific website to link directly to another” [17] (p. 157). For symbolically linked entities, hyperlinks are understood as a type of representational communication because no information flow is involved [18-20]. Hyperlinks have been described as vehicles for the expression of collective identity [21], public affiliation [21], credibility [17], visibility [18], reputation, authority, and endorsement [21]. The totality of hyperlinks on a set of organizations’ websites constitute an interorganizational network [17] and hyperlink networks demonstrate the structural embeddedness of online organizational behavior [23-25].

Organizational hyperlinking is a purposive and strategic communication choice [17, 19, 26]. Scholars have explored hyperlink networks from two perspectives. On the one hand, some previous scholarship examines hyperlink networks’ structural signatures, such as reciprocity, homophily, centrality, and transitivity of ties [18, 26]. On the other hand, some research tries to predict organizational hyperlink network patterns based on offline attributes, such as membership and financial ties [8], and visibility on traditional news media [9, 10]. However, research to date has tended to examine hyperlink networks independently from social media activity. Drawing from the view introduced above, that these activities are part of an integrated Web presence, this study uses four social media activity variables to understand and predict NGOs’ hyperlink networks.

3. Social media activity

Drawing from research that characterizes the different strategies that users have to manage their social media presence [28], we use four variables to characterize NGOs’ social media presence. First, we examine whether organizations have a social media profile or not. Organizations that have chosen not to use social media to communicate with publics have a distinct communication strategy from those that do. Second, we examine the length of time since social media adoption as an indicator of social media activity. As previous studies demonstrate, Web use longevity is a significant predictor of the number of hyperlinks organizations receive [10]. Similarly, longevity on social media is expected to configure organizations’ hyperlinking patterns because when organizations adopted social media reflects organizations’ strategies and capacity of new media use.

Third, we examine the frequency of posting as a characteristic of social media activity. In examining how NGOs are using Twitter to engage stakeholders, Lovejoy and colleagues [4] used posting frequency to study NGOs’ posting behavior. Bortree and Seltzer [5] operationalize the number of posts as the user’s network activity. Similarly, we argue that posting is an indicator of a strategic communication choice on the micro-blogging platform.

Finally, we examine the number of accounts an organization is following. Number of accounts followed is an indication of a social media activity, like posting. Further, the number of accounts followed is also evidence of a distinct social media strategy. Based on the relationship between follower and following, Krishnamurthy and colleagues [28] classified Twitter users into three types: broadcasters, acquaintances, and miscreants/evangelists. Broadcasters tend to have larger numbers of followers, but don’t follow many others. Acquaintances tend to have relatively equal numbers of followers and those they are following, primarily because they reciprocate those that follow them. Miscreants/evangelists, in contrast, follow many more accounts than follow them, in an attempt to encourage more people to follow them or strategically to use the platform as an information-gathering tool. This indicates that different micro-blog users have distinct strategies for managing their social media presence and that these can be partially understood by the number of accounts an organization is following.

These four measures of social media activity are in fact related. One must have a social media profile to be an adopter, post, and to follow other accounts. Similarly, longevity of a social media profile may be positively related to the number of posts and accounts followed, since users have had a longer time to create
posts and follow accounts. Finally, Kwak and colleagues [1] found that the number of accounts followed and number of tweets are positively correlated. Thus, both following and posting behavior can be perceived as an indicator of the user’s proactive micro-blogging strategy and activity. For example, Chen [29] used the number of accounts followed and total tweets as measurements for a user’s Twitter usage activity and behavior.

Although these four variables characterize an organization’s social media presence, it is not immediately clear how social media variables might be related to hyperlinking behavior. As such, we draw upon two theories that have been previously used to explain hyperlink networks: homophily and resource dependence theory. By testing the two additive theories, we aim to understand the mechanisms through which NGOs’ hyperlinking behaviors occur.

Homophily suggests that organizations recognize and hyperlink to other organizations of homophilous social media activities. In particular, cohort effects are present for similar organizations. In contrast, resource dependence theory [30] assumes that other organizations control critical resources and that hyperlinks are organizations’ responses to manage their public presence and external environments. It posits that the more resources an organization has, the more active and visible an organization is on social media, the more likely it is to receive hyperlinks. In the following sections, the two theories will be described in greater detail and a set of hypotheses will be introduced under each hyperlinking mechanism.

4. Homophily

Homophily plays an important role in the configuration of NGO networks [31-33]. Homophily describes actors’ tendency to search and select similar actors to oneself to form alliance and networks [34, 35]. Due to similar operating systems and organizational structures, homophilous organizations are more willing to collaborate for reduced uncertainty, increased communication, trust, and compatibility [31-33, 36]. Homophily is manifested in various aspects of the NGO network, such as geographic proximity [18, 33], social issues [8], organizational type at the global level [32], founding age [31], and legal status and common funding sources [31]. As such, three types of homophily mechanisms among interorganizational collaboration networks have been theorized, namely, attribute-based, geography-based, and institutional homophily [31].

In this study, we examine attribute-based homophily as the basis for connecting organizations’ social media presence and hyperlink network patterns. Attribute-based homophily is based upon the general characteristics across which organizations can be similar (e.g., age, mission, social media presence characteristics). Such similarities offer inducements and opportunities to form ties with particular partners; namely, organizations are more likely to hyperlink to other organizations that are similar in their adoption and use of social media.

First, this study explores whether social media profile, as defined in terms of whether NGOs have a profile on social media, plays a significant role in an NGOs’ choice of to which organization to hyperlink. Establishing presence on social media grants organizations more opportunities to be visible, thus, affects their perceived credibility and legitimacy. First, whether an organization has a profile on social media depends on general organizational and ICT use capacity, because establishing an official presence on social media requires an organization to devote money and human resources, and some NGOs are more apt than other NGOs to adopt and use social media [13, 37, 38]. Second, an organization’s desire to establish social media presence depends on its public relations objectives and goals [13]. Third, an organization needs to have the expertise and skill to establish an effective and successful social media presence [39]. Based upon homophily theory, we hypothesize that:

**H1**: NGOs with social media profiles are more likely to hyperlink to each other.

An important dimension of homophily is the cohort effects, that is, organizations within the same tenure group are more likely to connect with each other due to shared experiences [33, 40]. Cohort effects suggest that organizations of the same social media adoption cohort group are affected by similar social media usage experiences. As a result, organizations recognize other organizations of similar social media activities and experiences to develop interorganizational bonds [41]. Therefore, we hypothesize that:

**H2**: Early NGO social media adopters are more likely to hyperlink to each other.

Previous studies suggest that organizations with similar status are more likely to link to one another because organizational status reflects legitimacy and prestige [31]. From a holistic media presence perspective, this study investigates the source of informal status in structuring interorganizational networks, that is, social media activity status. Organizations that follow a similar number of accounts are utilizing a similar strategy and have invested
similarly in their social media presence. Similar levels of investments suggest similar status in terms of their overall social media activity. Organizations are able to detect organizations that have similar number of accounts followed and posts, in that it is readily available from an organization’s social media profile. Similar to the legitimacy status argument (see [31]), NGOs will acknowledge other NGOs with similar status on Weibo through hyperlinking to the NGOs’ websites. As the number of accounts followed and posts reflects an organization’s overall status of social media activity, the tendency for organizations to choose hyperlink targets as those having homophilous status to oneself increases. Therefore, we hypothesize that:

H3: NGOs that are following a similar number of social media accounts are more likely to hyperlink to each other.

H4: NGOs with similar numbers of total posts are more likely to hyperlink to each other.

5. Resource dependence theory

Resource dependence theory suggests that organizations vary in their capabilities to respond to external environments and other organizations that control critical external resources [42]. For NGOs, organizational structure, asset size, and donor dependence can affect NGOs’ adoption and usage of social media to manage stakeholder relationships [38]. NGO networks are interdependent with their external environments, especially the communication contexts where networks occur [43]. Offline dynamics and relationships, such as collaborative ties, membership and financial ties, as well as media visibility, influence NGO hyperlink networks [8]. To be more specific, organizations with greater economic resources tend to receive more hyperlinks [9, 10]. Moreover, Northern NGOs, with greater resources and visibility, are at the center of the international NGO hyperlink networks [18]. Further, preferential attachment, or hyperlinking to websites that already has a number of hyperlinks from other websites, is present in the hyperlink networks due to the perceived social influence and legitimacy of the hyperlink recipients [44].

Organizations’ hyperlinking behaviors are closely related to their social media activity, both of which are considered as organizations’ deliberate strategies and active practices to manage their external resources. In particular, organizations are expected to acknowledge other organizations that control the critical resources through hyperlinks. The more accounts that an NGO follows and the more posts an organization has on social media, the greater their social media resources. As a result, other organizations are motivated to hyperlink to these active organizations so as to establish the symbolic linkage and affiliation. Therefore, we hypothesize that:

H5: The number of social media accounts that an NGO follows is positively related to the propensity to receive hyperlinks.

H6: The total number of NGO social media posts is positively related to the propensity to receive hyperlinks.

6. Network analysis of NGOs in China

Previous studies of hyperlink networks have largely ignored websites of Chinese organizations. To the best of our knowledge, there are only two studies examining NGOs’ networking patterns in China. These two studies demonstrate both similarities and differences from the research findings conducted in the context of Western liberal countries. Yang’s [11] study on NGOs’ hyperlink networks in China indicates that domestic Chinese NGOs occupy a more central position in the hyperlink network and foreign international NGOs have to develop good connections with Chinese NGOs to receive media coverage. This is contrary to Shumate and Dewitt’s [18] study, which found that Northern NGOs, rather than Southern NGOs, were at the center of the international NGO hyperlink networks. Consistent with previous research in Western liberal countries, Pan [45] provides support for the resource dependence effects of AIDS NGOs’ network connections in China such that NGOs with sufficient funding, abundant resources, and close connections with the government tend to occupy more central positions and receive more attention in the network. In addition, national region homophily is also a significant predictor for AIDS NGOs’ network connections. In combination, these studies suggest that Chinese NGOs may use both similar and different rationales for hyperlinking than other NGOs.

7. Method

7.1. Data

The NGO sample for this study was obtained from the Beijing Civil Society Development Research Center (CDB), an important information and capacity building platform for China’s nonprofit sector. CDB cooperates with nine of their regional NGO partners to
identify influential NGOs in various social issues both at the local and the national level in China. Subsequently, CDB contacted these NGOs and NGOs that returned a form with background information about their organizations were included in their directory. In total, the directory yields to 814 NGOs operating in mainland China. After removing duplicates, inactive websites, and NGOs without valid websites, the websites of 410 NGOs were entered in Issuecrawler [46] in late January, 2014. These NGOs cover a variety of social issues, including education, child welfare, environmental conservation, animal protection, LGBT rights, and labor rights. They serve each of China’s national regions.

7.2. Measures

7.2.1. Network structures. Three types of internal network structures, *edge*, *mutual ties*, and *cyclical ties*, were entered as control variables in the ERGM analysis to address the interdependence issue [47]. *Edge*, or *choice*, is the simple likelihood of hyperlink ties being present in the network [35]. A *mutual* hyperlink represents the reciprocal ties between two organizations when organization A hyperlinks to organization B, and organization B also hyperlinks to organization A. The third parameter is *cyclical ties*, which measures the presence of two-path from organization A to organization B.

7.2.2. Social media profile. Social media profile indicates whether an organization has an official organizational profile on Sina Weibo, the largest micro-blog platform in China. However, personal Weibo profiles of those executive officers working in NGOs were not counted as having official profiles. This variable is a dummy variable where 1 represents having official profile and 0 indicates lack of official presence. This variable was used to test hypothesis 1.

7.2.3. Length of time since social media adoption. To assess the length of time an organization has been on social media, we used the date of the very first Weibo post of each NGO. We used a binary variable to indicate whether the organization is an early adopter or late adopter of social media. As the mean of the onset of activity was year 2011, we set the year 2011 as the cutting point where organizations started posting on Weibo before year 2011 was coded as early adopter, otherwise, it was coded as late adopter. This variable was used to test hypothesis 2.

7.2.4. Social media following. The number of accounts an NGO follows on Sina Weibo was assessed based on the profile of each NGO’s Weibo front page. However, for organizations without an official Sina Weibo account, the number of accounts followed was replaced with the value of zero. This variable was utilized to test hypothesis 3 and 5. Social media following was transformed using log method to deal with the L-shaped skewness in the dataset.

7.2.5. Social media posting. The number of an organization’s total posts was also used as an indicator of the organization’s social media activity. It was assessed on the profile of each NGO’s Weibo front page. Again, the number of total posts was replaced with the value of zero for organizations without an official Sina Weibo profile. This variable was utilized to test hypothesis 4 and 6. Social media posting was also transformed using log method to deal with the L-shaped skewness in the dataset.

7.3. Analysis

Issuecrawler, a Web crawler that collects network data and maps link-structures, was used to map the NGO network in this study. We used the interactor analysis within the Issuecrawler package to crawl the entered domains’ outlinks and analyze the inter-linking patterns between the NGOs [46]. Consistent with Shumate [26], the crawler was run with a page depth of three and over three iterations.

Data collection depends on the retrieval capacities and features of the Web crawler [48]. As Issuecrawler limits coverage to selected seeds and websites, it has been “considered reliable in terms of sampling and robustness” [49] (p.452). However, the reliability of Issuecrawler may be problematic as it “primarily provides data on links, not on the functional capacities of Web sites in a Web 2.0 world” [49] (p.452), thus, it might fail to harvest websites full of Web 2.0 codes (see [46, 49]).

Descriptive statistics of the hyperlink network were created to provide an overview of the NGO data. These included the degree centrality, which describe the total number of hyperlinks that each organization sends or receives. The density, that is, the ratio of number of observed hyperlinks compared to the maximum amount of hyperlinks possible in the network, is reported as well (see Table 1).

To test the six hypotheses, we examined the relationship between the hypothesized social media activity variables and hyperlink network data. We used exponential random graph modeling (ERGM) with Markov chain Monte Carlo maximum-likelihood estimation within the R-project package [50]. Compared to traditional methods such as logistic
regression, ERGM models in R allow for the estimation of both structural and attribute parameters. As a result, pure structural network effects and attribute effects can be distinguished. Therefore, the complex issue of the interdependence of network data is resolved (see [8, 51]). Convergence was achieved when t-ratios were less than 0.1 and a parameter is considered significant when the estimate was 1.96 times larger than the magnitude of the standard error [52]. In the current study, all parameters converged in the reported models.

Table 1. Descriptive network statistics

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>Average degree</td>
<td>2.971</td>
<td></td>
</tr>
<tr>
<td>Connectedness</td>
<td>0.314</td>
<td></td>
</tr>
<tr>
<td>Average distance</td>
<td>4.237</td>
<td></td>
</tr>
<tr>
<td>Number of ties</td>
<td>1218</td>
<td></td>
</tr>
<tr>
<td>Number of mutual ties</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Number of asymmetric ties</td>
<td>1044</td>
<td></td>
</tr>
<tr>
<td>Number of isolates</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Number of active NGOs</td>
<td>410</td>
<td></td>
</tr>
<tr>
<td>Number of domains before extracting network</td>
<td>542</td>
<td></td>
</tr>
</tbody>
</table>

8. Results

Table 2 reports the maximum likelihood estimates (MLEs) of both the control and hypothesized parameters. The estimates for the baseline model, containing only the control parameters and structural network variables, are included in the first column of Table 2. Hypothesis 1 examined whether NGOs with social media profiles were more likely to hyperlink to each other than by chance alone. In the final model when all other social media activity variables were controlled, we did not find support for hypothesis 1. Thus, NGOs with social media profiles were not more likely to hyperlink to each other than by chance alone.

Hypothesis 2 examined the influence of social media adoption cohort on their hyperlinking behaviors (see final model). Our results indicate that early NGO social media adopters preferred to hyperlink to each other (MLE = 0.19, SE = 0.09). However, late NGO social media adopters were less likely to hyperlink to each other (MLE = -0.19, SE = 0.07). Therefore, hypothesis 2 was supported (see Figure 1 for network illustration).

Hypothesis 3 and hypothesis 5 examined the homophily and resource dependence effects of NGOs’ number of accounts followed on hyperlinks respectively. We did not find support for hypothesis 3 or hypothesis 5 because neither was statistically significant. Therefore, NGOs with larger number of accounts followed were not more likely to receive hyperlinks. In addition, NGOs with similar number of accounts followed were not more likely to hyperlink to each other than by chance alone.

Table 2. ERGM with MLEs

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge</td>
<td>-5.20 (0.03)**</td>
<td>-6.08 (0.20)**</td>
</tr>
<tr>
<td>Mutual ties</td>
<td>3.27 (0.11)**</td>
<td>3.22 (0.13)**</td>
</tr>
<tr>
<td>Cyclical ties</td>
<td>0.72 (0.05)**</td>
<td>0.71 (0.05)**</td>
</tr>
<tr>
<td>H1: Profile (Yes)</td>
<td>0.09 (0.14)</td>
<td></td>
</tr>
<tr>
<td>Profile (No)</td>
<td>0.60 (0.26)**</td>
<td></td>
</tr>
<tr>
<td>H2: Age (Early)</td>
<td>0.19 (0.09)**</td>
<td></td>
</tr>
<tr>
<td>Age (Late)</td>
<td>-0.19 (0.07)**</td>
<td></td>
</tr>
<tr>
<td>H3: Following (HOM)</td>
<td>0.00 (0.06)</td>
<td></td>
</tr>
<tr>
<td>H4: Posts (HOM)</td>
<td>0.06 (0.05)</td>
<td></td>
</tr>
<tr>
<td>H5: Following (RDT)</td>
<td>-0.05 (0.08)</td>
<td></td>
</tr>
<tr>
<td>H6: Posts (RDT)</td>
<td>0.34 (0.06)**</td>
<td></td>
</tr>
<tr>
<td>AIC</td>
<td>13991</td>
<td>13878</td>
</tr>
<tr>
<td>BIC</td>
<td>14021</td>
<td>13998</td>
</tr>
</tbody>
</table>

Note: RDT = Resource dependence theory; HOM = Homophily.

*p < .05  **p < .01

Figure 1: Number of accounts followed and Weibo adoption cohort

Note: The size of the node represents the number of accounts followed and the color of the node reflects the social media adoption cohort.

Hypothesis 4 and hypothesis 6 examined the homophily and resource dependence effects of NGOs’
number of total posts on hyperlinks. Hypothesis 6 was supported (H6, MLE = 0.34, SE = 0.06) while hypothesis 4 was not (H4, MLE = 0.06, SE = 0.05). This suggests that NGOs with larger number of total posts were more likely to receive hyperlinks. However, NGOs with similar level of posting were not more likely to hyperlink to other NGOs with similar level of total posts than by chance alone.

9. Discussion

The purpose of this research is to ascertain the link between social media activity and hyperlink networks as dynamic systems of representational communication from a holistic media ecology perspective. This study examines 410 NGOs and 1,218 hyperlinks. We used four aspects of NGOs’ social media activities to predict their hyperlinks, namely, the presence of a social media profile, length of time since social media adoption, number of accounts followed, and number of posts. From the perspective of two theories: homophily and resource dependence, we examined the theoretical mechanisms that linked social media activity to hyperlink networks. The results from this research suggest that social media activity is related to NGOs’ hyperlinking behaviors. In particular, length of time since social media adoption and number of posts affect the configuration of NGO hyperlink networks. In addition, this study finds that both resource dependence and homophily provide additive explanations of the ways that multiple sources of the social media system influence hyperlinking behaviors. Each of these results is discussed individually below.

9.1. Holistic online organizational presence

Our research indicates that organizations’ presence on social media and their websites are closely connected to each other, which supports the media ecology theory [12] and the “holistic media effects” perspective coined in this research. Extending previous scholarship that hyperlinks on websites are connected to the mass media system [9-11], the current research finds support for the interactive connection between social media activity and hyperlinks from websites. Therefore, hyperlink networks are not only shaped by offline dynamics and traditional mass media, they are also configured by various new media systems, including social networking sites. The results of this research suggest that researchers should investigate hyperlink networks from a holistic media effects perspective and that perhaps social networking site researchers should consider the effects of Web 1.0 media.

9.2. Homophily vs. resource dependence

Hyperlink networks are connected to the social media system through two additive theoretical mechanisms: homophily and resource dependence. Length of time since social media adoption is associated with homophily effects and number of social media posts is related to resource dependence effects. The social media cohort effect, grounded in homophily theory, suggests that organizations that share similar social media experiences are motivated to hyperlink to each other. In contrast, the number of posts can be perceived as a social media resource, built up by the investment of each posts. Organizations with more posts were hyperlinked to more often than organizations with fewer posts. This later effect was stronger than the former. Therefore, our findings suggest that resource dependence theory better explains the link between social media activity and NGO hyperlink networks.

9.3. Social media posts and number of accounts followed

Our study suggests that social media activity is an additive investment in an organizations’ public presence. Compared to traditional mass media visibility, an organization’s activity on social media is easy for other organizations to track and navigate. This study also highlights the significance of number of total posts to attract hyperlinks. Through continuous posting, organizations generate accumulative influence on social media and higher visibility. In comparison, the number of accounts followed does not help NGOs to attract more hyperlinks or drive hyperlinking behaviors. Although number of accounts followed and posts are positively correlated [1], this study indicates that number of posts is a more effective and efficient social media behavior than following others’ social media accounts to enhance visibility and influence, probably because posting is relevant to the ability to diffuse information on social media. This is consistent with the results of previous studies that the total number of posts is positively correlated to the number of an account’s follower, which is a partial indicator of influence and popularity on social media [27, 53].

9.4. Length of time since social media adoption

In line with homophily theory and cohort effects, this study finds the evidence of cohort effects for organizations’ adoption of social media on hyperlink networks. That is, early social media adopters were more likely to hyperlink to early social media adopters.
This suggests that early social media adopters are perceived credible and legitimate among the same cohort group, and that early innovation adopters might share similar organizational capacity, expertise, and desire to use social media. Additionally, the length of time since social media adoption is a salient organizational attribute visible to other organizations in the social network.

9.5. Practical implications

This study has several practical implications for NGOs to manage their social media activity and public presence in order to configure hyperlink networks in their favor, and thereby enhance their profile in search engines. First, NGOs should strive to be the first generation of new social media adopters as new platforms become popular and available. Second, NGOs should focus more on their posting behaviors than other social media behaviors. Consistent with previous research [27], micro-blog users’ ability to generate re-tweets and diffuse information is an important indicator of their influence and visibility on social media, which attracts hyperlinks from other actors in the social network. Third, from the holistic media ecology perspective, NGOs should be consistent about managing their public presence across different media systems, such as websites, news media, and social media.

10. Conclusion

In conclusion, the current study theorizes that interorganizational hyperlink networks are closely connected to organizations’ social media activity and presence. This research makes four contributions to the study of NGO hyperlink networks. First, we argue for a holistic media ecology perspective to the study of organizational online behavior by arguing that NGOs’ activity on social media is connected to their hyperlink networks. Second, this study indicates that homophily and resource dependence both shape NGOs’ hyperlink networks, and resource dependence theory better explains NGO hyperlink networks. Third, this study argues that the length of time since social media adoption matters for NGOs’ hyperlinking decisions in the social network. And finally, this study indicates that social media posting is a more effective and efficient way to influence hyperlinks than other social media behaviors.

The current study coins the interaction between social media and hyperlink networks as “holistic media effects.” We are now in a world of multiple online platforms that can be used to showcase organizations and communicate to the publics. These platforms cannot be considered in isolation, because of the ease of navigating from one platform to another. They must be understood as part of an integrated Web presence and mutually influential.

11. References


