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Convergence or divergence: Exploring different mechanisms driving children's rights organizations' offline versus online interorganizational alliance building

Wenlin Liu[a,*], Jieun Shin[b]

[a] Jack J. Valenti School of Communication, University of Houston, 3347 Cullen Blvd, Houston, TX 77204, United States
[b] Department of Telecommunication, College of Journalism and Communications, University of Florida, 2096 Weimer Hall, 1885 Stadium Road, Gainesville, FL 32611, United States

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ABSTRACT

NGOs today increasingly use multiple technology platforms to build and maintain relationships with other organizations. However, the extent to which these platforms enhance NGOs' networking capacity beyond their offline connections is not well understood. Focusing on the status seeking versus resource-exchange logic, this paper asks what mechanism drives NGOs' networking behaviors across three different platforms by comparing the offline alliance network with two forms of online networks among a group of international children's rights NGOs and their NGO/IGO partners: (a) hyperlink network that emerges from organizational websites, and (b) Twitter follower-followee network. Exponential Random Graph Modeling (ERGM) analysis shows that NGOs are more likely to connect to high-status organizations both offline and online. Meanwhile, whereas NGOs are more likely to connect with geographically proximate others offline, online relationships are not constrained by geographic distance. Our findings confirm the boundary-spanning capacity of information and communication technologies (ICTs), which enables NGOs to expand existing interorganizational networks.

International organizations such as NGOs (non-governmental organizations) and IGOs (inter-governmental organizations) play a critical role in promoting the welfare and rights of children around the globe. The coalition formed in this organizational community has directly contributed to the ratification of the United Nations Convention on the Rights of Children (UNCRC) in 1989 (Cohen, 1990). The UNCRC is the first international treaty that formally recognizes children's rights as human rights, which is now adopted by over 190 countries (UNICEF, 2014). In particular, NGOs act as both partners and pressure groups in their relationships with IGOs in shaping, implementing, and monitoring the commitments countries have made under the CRC (Ensalaco and Majka, 2005).

The tradition of building strategic partnerships with multi-sector organizations still characterizes much of the networking strategy of children's rights organizations (Sikkink and Smith, 2002), and such a strategy is developed hand-in-hand with the rapid proliferation of social media and the so-called "Web 2.0" technologies supporting interorganizational communication (Curtis et al., 2010; Lovejoy and Saxton, 2012; Nah and Saxton, 2012). Like other organizations, children's rights NGOs today have begun to integrate networked social media, such as Twitter, to achieve advocacy goals during campaigns (Goldkind and McNutt, 2016), communicate with stakeholders (Waters et al., 2009), and manage strategic alliance relationships with their partner organizations (Lovejoy and Saxton, 2012).

* Corresponding author.
E-mail addresses: wliu30@central.uh.edu (W. Liu), jieun.shin@ufl.edu (J. Shin).

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With these NGOs simultaneously engaged in both online and offline interorganizational relationship building, it remains less well understood whether and how online platforms actually enhance NGOs' networking capacity. In other words, are network ties built online merely a reflection of organizations' offline ties, or they fulfill functions that traditional offline ties cannot? Recent research has shown that NGOs' online interorganizational networks were highly indicative of their offline strategic intention, and thus could be explained by offline characteristics (Pilny and Shumate, 2012). The research reported here builds on this prior research by addressing the following questions: (1) To what extent do organizations' online and offline interorganizational networks exhibit overlap or divergence, and (2) whether and how technology platforms extend interorganizational connections beyond existing offline ties?

To address these questions, we report the results of a cross-platform study of a group of children's rights NGOs' interorganizational networks. We posit that the extent to which NGOs' online and offline networks demonstrate overlap or divergence can be explained by a status seeking versus a resource-exchange logic. Specifically, since an NGO's online network is more likely to be used to signal symbolic power and communicate legitimacy to their stakeholders (Shumate and O'Connor, 2010), the mechanism of status-seeking—an institutional theory logic that describes the tendency for organizations to connect with established, high-status others—may manifest itself more strongly in the online than offline interorganizational networks. On the other hand, offline alliance relationships are more likely to fulfill the resource exchange function, allowing organizations to acquire necessary resources from another organization through partnerships. We posit that factors facilitating resource exchanges, such as geographic proximity—the tendency for organizations to partner with organizations from geographically proximate areas— can more strongly predict the formation of offline than online interorganizational relations.

The current study makes important theoretical and practical implications. First, relatively few studies have theorized and empirically compared the nature of alliance relationships across different platforms, except Lai et al. (2017) and Shumate and Contractor (2013). Our study provides insights to better understand the multifaceted nature of interorganizational relationships. Second, the results of our study indicate that international organizations may reap different networking benefits from online versus offline relationships. Online platforms allow organizations to connect with geographically distant others and provide opportunities for young and less established organizations to gain visibility in the community. The insights produced here may help the community better strategize relationship building in the digital age.

In the following, we first distinguish NGOs' online versus offline interorganizational relationships, using institutional and resource dependence theory to understand how partnerships formed online versus offline may be driven by different mechanisms. We then compare the offline, hyperlink, and Twitter following networks among 228 children's rights organizations, exploring the extent to which these networks converge or diverge.

1. Online versus offline interorganizational relationships: how do they differ

Interorganizational alliance in the current study is defined as collaboration and relational associations strategically formed between organizations (Hardy et al., 2003). For NGOs, their alliances can be defined as a process in which different partners "work together to address problems through joint effort, resource, and decision making and share ownership of the final product or service" (Guo and Acar, 2005, p. 343). Compared to corporations, NGOs may more heavily depend on alliance relationships to acquire necessary resources for survival. For example, NGOs often need to collaborate with multiple partners when seeking grants from government or other funding agencies (Mitchell, 2014). Client and donor referrals are also common practices for NGOs to maintain financial and operational stability (Guo and Acar, 2005). Furthermore, the success of joint action often hinges on interorganizational relationship building as collaboration is critical for NGOs to initiate collective action and accomplish goals that cannot be accomplished on their own (Pilny and Shumate, 2012),

1.1. Offline relationships

Offline interorganizational relationships, in forms such as coalitions, joint ventures, or resource exchanges, represent a long-standing form of interorganizational alliances. Scholars have studied NGOs' offline alliances primarily from a resource dependence perspective (Pfeffer and Salancik, 2003). This perspective contends that organizations are motivated to build relationships to gain access to resources such as funding, human capital, and expertise (Das and Teng, 2000; Pfeffer and Salancik, 2003). From this perspective, alliance relationships are "driven by a logic of strategic resource needs and social resource opportunities" (Eisenhardt and Schoonhoven, 1996, p. 137).

The bilateral or multilateral exchange of tangible resources is thus one of the defining features of offline relationships, and such relationships are commonly conceptualized as an instrumental means for NGOs to obtain or deliver goods and services. For example, in the context of disaster relief, the on-the-ground collaborative networks among relief organizations proved critical to deliver humanitarian relief to the community affected by the typhoon (Lai et al., 2017). Furthermore, social interactions between organizations, especially repeated interactions, are essential in the formation and maintenance of offline relationships, as such relationships take greater trust and commitment to build (Ring and Van de Ven, 1994).

1.2. Online relationships

Meanwhile, NGO relationship building has extended beyond their offline forms to include both hyperlinks among organizational websites and networked social media connections (Curtis et al., 2010; Gonzalez-Bailon, 2009; Lovejoy and Saxton, 2012). Compared

to offline relationships, online relationships are virtual ties that not necessarily emerge from social interactions, nor do they fulfill the resource exchange function as offline ties do. Often strategically embedded in an organization's website, the hyperlink has been particularly noted for its contribution to "connective public goods", a form of public goods that can link together the community and afford direct communication among its members (Fulk et al., 1996, p. 60). In the context of NGO communication, Shumate and Lipp (2008) referred to a hyperlink-based connective public good as "a set of interorganizational links that enable members and non-members to reach a homogenous set of like-minded organizations in order to enhance the visibility of the network's goals" (p. 179). This function can even go beyond the virtual sphere and bring about tangible offline outcomes for the organization, such as mobilizing resources for offline collective action (Pilny and Shumate, 2012).

Along with hyperlinks, NGOs are increasingly using networked social media sites. According to the global NGO technology report (2018), the most popular social media platform used by NGOs was Facebook (92%), followed by Twitter (77%). Studies have identified three primary functions of social media for NGOs, including streamlining internal management, educating the public about programs or services, and communicating accountability towards stakeholders and external publics (Bortree and Seltzer, 2009; Lovejoy et al., 2012; Saxton and Guo, 2011; Svensson et al., 2015).

The networking or relationship building role of social media platforms is particularly well acknowledged. Similar to the function of growing individuals' social networks (e.g., LinkedIn used in individuals' job hunting, Ellison, 2007), social networking sites afford new ways for organizations to grow their interorganizational networks through the use of hyperlinking, "following," or sharing other users' content on social media. In particular, the follower-followee feature of Twitter has been noted to enable resource-low NGOs to draw greater public attention to their causes (Thrall et al., 2014). Given an increasing number of NGOs are simultaneously engaged in both online and offline relationship building, a major question arises as to whether and how the relationships generated and sustained by these online platforms may differ from the traditional offline relationships?

1.3. The differences between offline versus online relationships

Although multiple forms of interorganizational relationships (e.g., offline, hyperlink, follower-followee on Twitter) are intrinsically linked (Pilny and Shumate, 2012), we draw from Shumate and Contractor's (2013) taxonomy of network relations to argue that the specific nature of these relationships differs substantially. Shumate and Contractor (2013) summarize four types of relations emerging from communication networks: (1) flow, (2) affinity, (3) representational, and (4) semantic. While NGOs' offline alliance relationships are commonly viewed as a form of affinity relationships, the authors argue that online relationships are better conceptualized as a form of representational relations (Shumate and Contractor, 2013). For example, hyperlinks among organizations are intended to signal the association to *a third party* or the public. One example of such representational relations is the cross-sector hyperlink ties between NGOs and corporations (Shumate and O'Connor, 2010). For corporations, hyperlinks to NGOs acted as a form of corporate social responsibility communication, whereas NGOs' link to corporations was similarly driven by the logic of communicating legitimacy to their stakeholders.

Meanwhile, the follower-followee relations on Twitter can be viewed as representational in nature, as well as a form of information flows. By "following" another organization, the follower organization not only becomes a regular recipient of updates or information sent by the followee organization, but it also signals desired affiliations to the stakeholder community.

Having distinguished the different natures of NGOs' offline versus online networks, we posit that online interorganizational relationships may be motivated by distinct mechanisms than those that shape traditional offline relationships. Specifically, we propose an institutional theory perspective to explain the formation of hyperlink and Twitter following relationships due to the representational, symbolic nature of these relations. On the other hand, offline interorganizational relations are more likely to fulfill the role of exchanging resources. Therefore, a resource dependence logic, and specifically the factor of geographic proximity in the context of our study, may more strongly impact the formation of offline ties. Below, we further elaborate on the two theoretical perspectives.

2. An institutional theory perspective of online alliance ties formation

Institutional theory delineates normative influences that govern organizations' interorganizational relationship building (DiMaggio and Powell, 1983). The theory argues that because organizations are embedded in the larger cultural and power system, and they experience survival pressure to conform to the institutional environment, and thus normative influences can powerfully shape organizations' behaviors (DiMaggio and Powell, 1983). Legitimacy seeking is one specific form of normative influence rooted in the institutional environment. Legitimacy is defined as "the level of social acceptability bestowed upon a set of activities or actors" (Washington and Zajac, 2005, p. 284). One important way for an organization to gain acceptance is through establishing interorganizational linkages with other members in the community (Carroll and Hannan, 2000). Whereas for-profit organizations often seek interorganizational partnership to advance individual goals, in many cases NGOs work towards shared goals that can only be enacted through the collective participation of multiple organizations (Baldassarri and Diani, 2007; Ebrahim, 2009).

Two types of connections are particularly helpful in elevating an organization's legitimacy: the connection to high status members in the community, and the connection to older organizations (Margolin et al., 2015). High status organizations are those that enjoy a prominent position relative to other members in the community (Wejnert, 2002). Compared to organizations of lower status, prominent organizations are perceived as more legitimate than those with lower status, and they are in a better position to confer their own legitimacy on their partners (Atouba and Shumate, 2015; Johnson et al., 2006). In operationlizing organizational status, we take into account the following two dimensions. The first is a social-structural dimension that emphasizes the structural location of an

individual organization within the larger interorganizational network, with centrally located organizations enjoying a high structural status (Podolny and Page, 1998; Powell et al., 2005). Centrality in this sense is indegree centrality, defined as the number of connections an organization *receives* from other members of the community (Borgatti, 2005). The second is a social-cultural dimension of status that deals with the cultural or historical legacy of an organization, often operating as the endorsement from the external stakeholders (Washington and Zajac, 2005). In the international children's rights NGO community, one important proxy for an NGO's social-cultural status is *consultative status,* defined as the acknowledgement of an NGO's expertise in a given area, accredited by inter-governmental organizations (IGOs) such as the United Nations[1] (Atouba and Shumate, 2015). The acquisition of consultative status often involves formal application and meeting a set of eligibility criteria, and the status itself grants NGOs privileges such as governmental lobbying and direct participation in policy-making processes (Cohen, 1990). Therefore, NGOs that receive consultative status can be viewed as of higher organizational status than those that do not (Atouba and Shumate, 2015).

In addition to status, another way to confer legitimacy occurs when older organizations offer benefits to partners due to their ability to share their own learning and experiences regarding normative expectations. Older organizations have survived the "liability of newness" that creates evolutionary survival disadvantages for newer organizations in a community (Singh et al., 1986). Established organizations have had a greater chance to learn what actions are legitimate and remove those actions that are illegitimate from their routine (Margolin et al., 2015). By connecting with older organizations, newer organizations can obtain important normative information from the experiences of their partners. The partnership can also convey to interested others that the newer organization will act normatively in ways sanctioned by its older partners.

As discussed in the prior section, an NGO's online networks are often representational in nature, serving to communicate with the complex set of stakeholders to whom NGOs want to signal legitimacy. This representation can include legitimacy that is reflected from high status partners, or legitimacy based in communications about norm conformity learned from older partners. Of course, offline networks also can be sources of legitimacy seeking through connections to high status and older organizations. But as offline networks have a variety of other purposes such as resource sharing, information transfer, or securing advantage in fundraising (Bryson et al., 2006), we argue that the composition of an offline network is less dominantly driven by legitimacy seeking. That is, compared to NGOs' offline interorganizational network, the online networks, including both hyperlink and Twitter following network, are particularly likely to exhibit the tendency of connecting with high status organizations (as indicated by an organization's indegree centrality in the interorganizational network, and consultative status), as well as to older organizations in the community.

H1a: Compared to offline interorganizational network, NGOs' hyperlink and Twitter network will demonstrate a strong tendency to connect with those that enjoy high indegree centrality.

H1b: Compared to offline interorganizational network, NGOs' hyperlink and Twitter network will demonstrate a strong tendency to connect with those that enjoy consultative status.

H2: Compared to offline interorganizational network, NGOs' hyperlink and Twitter networks will demonstrate a great tendency to connect with older organizations.

3. Resource dependence and the role of geographic proximity in offline ties formation

Geographic proximity has long been viewed as a significant antecedent leading to the formation of offline alliance relationships among organizations (Shaw and Gilly, 2000; Sternberg, 1999; Oerlemans and Meeus, 2005). There are a number of intertwined processes through which geographic proximity facilitates the exchange of resources, thereby promoting interorganizational alliance. First, geographic proximity facilitates more frequent social interactions between organizations thus reducing uncertainty (Shaw and Gilly, 2000). These interactions, either planned or serendipitous, offer opportunities for NGOs to gain familiarity and trust with one another, which is essential for exchanging resources and developing interdependence (Gulati and Sytch, 2008; Pfeffer and Salancik, 2003). Second, geographic proximity can reduce costs at various stages of alliance building (Ring and van de Ven, 1994). For example, at the initial stage to explore and identify alliance partners, searching local information is generally less costly than searching globally (Rosenkopf and Almeida, 2003).

Extensive empirical evidence has further lent support to the idea that organizations generally prefer building localized alliances, and geographical proximity can significantly increase the likelihood of alliance tie formation. Reuer and Lahiri (2013), for example, investigated the impact of geographic distance on the formation of R&D collaboration, a specific form of interorganizational alliance for the purpose of sharing resources related to research and development. They conducted an empirical analysis on the semiconductor industry, an industry uniquely characterized by a high level of geographic clustering (Almeida and Kogut, 1999). The analysis showed that even within the same geographic cluster, proximity still significantly increased the likelihood of R&D collaboration, and such effect was even stronger when the firms did not have prior alliance ties, operated in different product markets, or possessed different amounts of technological resources. In the area of NGO alliance building, geographic proximity is consistently found to contribute to the formation of offline alliance ties as well. For example, Shumate et al. (2005) examined the interorganizational alliance network within the HIV-AIDS NGO community, and they found that alliance relationships were more likely to take place between organizations that were geographically proximate.

On the other hand, NGOs' use of technology platforms may better afford interorganizational ties that transcend geographic

[1] According to the United Nations Department of Economics and Social Affairs (ECOSOC), the first time NGOs participated in formal UN deliberations was through ECOSOC in 1964, and consultative status thus grants NGOs the legitimacy to formally engage in policy making and consultation processes. In addition to ECOSOC, other international agencies may also grant consultative status in the economic and social areas.

dispersion. For instance, organizational websites provide NGOs with the virtual space to promote their own work and agenda to the public regardless of their geographic locations, and they offer the capability to link with other organizations with little or no cost (Kropczynski and Nah, 2011). Meanwhile, Twitter feeds are evident in algorithms that recommend "who to connect with" based on factors such as similar interests, mutual friendship ties, the number of followers, and locations (Gupta et al., 2008). In addition, Twitter enables connections a click away by allowing users to follow almost any parties without seeking for their permission (Kwak et al., 2010). All those functions significantly reduce an organization's efforts to gather information about whom to connect with and who is worth their attention.

It is therefore likely that online interorganizational relationships are less likely to require close collaboration or shared culture that benefits geographically proximate organizational relationships. An organization can establish hyperlinks or following relationship even in the absence of significant social interaction between linked organizations, or even without the consent or knowledge of the organizational target of the link.

Following the resource exchange argument outlined above, we posit that online interorganizational networks may exhibit a weaker effect of geographic proximity, as distant online connections can be more easily established through technology platforms, and such relationships are more likely to serve symbolic purposes than fulfilling resource exchange functions:

H3: Compared to offline interorganizational network, NGOs' Twitter and hyperlink networks will demonstrate a weaker effect of geographic proximity.

4. Methods

4.1. Study context: international children's rights organizational community

Currently, there are over two thousand children's rights NGOs at local, national, and international levels (Child Rights International Network, 2018). These organizations work on a diverse range of issues from fighting against childhood violence, child trafficking, juvenile injustice, to providing educational and health care resources to disadvantaged children and adolescents. Despite having different issue agendas, the children's rights NGO community has been coalescing around the ratification and implementation of the UN Convention on the Rights of Children (UNCRC) (Margolin et al., 2015). The drafting of the convention began in 1978, and it culminated in the ratification of the UNCRC in 1989, a milestone event in the history of children's rights advocacy.

It has been widely acknowledged that NGO networks play a central role in developing a coherent conception of children's rights and building an inclusive coalition that involves governmental, inter-governmental, and civil society organizations around the globe (Cohen, 1990). The success of alliance building among international children's rights community exemplifies how interorganizational networks can be leveraged to coordinate action, exchange resources, and ultimately achieve shared goals. Furthermore, as the past decade witnesses the expansion of the network from "Global North" to "Global South" (Livingstone and Bulger, 2014), it is especially important to examine how such interorganizational network, with the aid of information and communication technologies (ICTs), connect members from diverse geographic locations.

4.2. Identification of sample organizations

To identify international children's rights NGOs and their partnering organizations, we took the following steps. First, the authors followed the procedure taken in Margolin et al. (2015) and identified organizations whose names, descriptions, or activity fields contained "child" and "rights" from the Union of International Association's (UIA) database. As a non-profit and non-governmental research institute, UIA[2] collects comprehensive information about over 60,000 organizations (both active and dormant) that have international structure, membership, or operation and publishes this information in the UIA yearbook. In addition, the authors consulted UIA in March 2015 to obtain a list of INGOs whose mission and main activities revolved around promoting and protecting the rights of children. Based on UIA's online database and staff's domain knowledge, these two procedures identified 48 unique and currently active international children's rights NGOs.

Next, we collected the partner information of the 48 children's rights NGOs using the print version (2014/2015) of UIA's Yearbook of International Organizations. Through this step, we identified additional 366 organizations with which the 48 seed organizations formed partnerships, yielding a total of 414 organizations. Hereafter, we refer to this set of organizations ($N = 414$) as the "international children's rights organizational community." The boundaries of the three interorganizational networks –offline, hyperlink, and Twitter – were drawn based on whether an organization was part of this community.

4.3. Preparation of the three interorganizational networks

The partnership information comes primarily from an organization's voluntary response to the annual UIA survey, and the nature of relationship varies from "consultative status with", "membership", to "collaborate with." The offline relationships measured here thus represented a set of formal, institutionally acknowledged relations that involved resource exchanges (e.g., financial, human capital, or expertise). Due to the way an organization was nominated by a partner during the survey process, we treated all the offline

[2] According to existing research, UIA is one of the most comprehensive sources to identify international NGOs that work on various social issues (Atouba and Shumate, 2015; Margolin et al., 2015).

relationships as directional. The offline network was comprised of 414 organizations and 543 ties.

For the hyperlink network, we used an open source Java based crawler, *Nutch* (http://nutch.apache.org), to extract the outbound hyperlinks from each site. Since 40 out of 48 organizations had websites, the crawler collected hyperlinks from the 40 websites. After eliminating internal links (i.e., hyperlinks within a website), we retrieved a large set of hyperlink dyads ($N = 5357$). From this set of hyperlinks, we retained only organizations that were identifiable from the international children's rights community ($N = 414$).[3] This procedure identified 284 dyads of hyperlink connections among the 414 organizations.

The Twitter network was constructed using a script in Python programming language from Twitter search API (Application Program Interface) in May 2015. The procedure was similar to that of constructing the hyperlink network. Among 48 initial organizations, 27 organizations owned organizational Twitter accounts. Using the set of Twitter accounts ($N = 27$) as seeds, we crawled all other users that each seed organization followed. This process yielded a total of 30,756 follower-followee relationships. Similarly, we retained only organizations that belonged to the children's rights community and identified 384 following relationships among the 414 organizations.

Finally, for the purpose of comparing the three networks, we only retained organizations that had all three forms of ties. Among the total 414 organizations in the offline network, 376 (90.82%) had official websites, and 231 organizations (55.80%) had an active Twitter account during the time of data collection. The final step yielded a sample of 228 organizations, including 171 NGOs (75%), 38 IGOs (16.7%), and 19 other forms of organization (8.4%) such as conventions, international protocols, agreements, or other short-term coalition organizations.

The final cross-platform networks consisted of the same 228 organizations with 281 offline ties, 185 hyperlinks, and 172 Twitter following relationships among them.

4.4. Measures

4.4.1. Structural status

Each organization's structural status was indicated by its indegree centrality in the offline interorganizational network, ranging from 0 to 9 ($M = 1.23$; $SD = 1.05$).

4.4.2. Consultative status

The consultative status of each NGO was first identified from several lists published by IGOs that grant such status, including the United Nations Economic and Social Council (ECOSOC), the Council of Europe (CoE), and the Organization for Security and Cooperation in Europe (OSCE). In addition, organizations' self-report data, including website statements and annual reports, were further reviewed to determine if an NGO received consultative status. A total of 110 NGOs (64.33% of the entire NGO sample) were identified to have consultative status.

4.4.3. Organizational age

Organizations' founding year was collected via organizational self-report on the official websites, often on the "history" or "about us" webpage or through organizations' annual reports. Age was calculated by subtracting each organization's founding year from 2015, the year of data collection. The average age of selected organizations was 53.21 years ($SD = 42.42$).

4.4.4. Geographic proximity

The current study used a proxy of geographic proximity by constructing a region-based homophily matrix (Shumate et al., 2005), taking the following steps: First, each organization's region of operation was collected, and such information was identified by reviewing each organization's scope of programs as reported on its official website. The location information was further coded into six categories: 1- North America only ($N = 6$, 2.6%), 2- South America only ($N = 6$, 2.6%), 3- Europe only ($N = 24$, 10.5%), 4- Asia and Pacific area only ($N = 9$, 3.9%), 5- Africa only ($N = 11$, 4.8%), and 6- international, when an organization's operating area spanned more than one continent ($N = 172$, 75.4%). Second, a 228 by 228 adjacency matrix was created, with any two organizations operating in the same region coded as 1, and the rest coded as 0 in the matrix.

4.4.5. Control variable

As inter-governmental organizations (IGO) often act as leaders or coalition builders on the children's rights issue (Axford, 2012), these organizations are more likely to be chosen as partners in the first place. To control for such an effect, we created a binary variable of IGO as a control variable in the model.

4.5. Analysis

To test whether hypothesized mechanisms drove the tie formation process across different platforms, Exponential Random Graph Modeling (ERGM) was conducted on three interorganizational networks to test H1a, H1b, H2, and H3. ERGMs, also known as the p^* models, are a family of probability models that use simulation techniques to make inferences about whether and how the

[3] That is, if website A linked to website B, but website B was not one of the organizations in the offline network ($N = 414$), we would exclude these dyads to ensure that networks under investigations are comparable.

Table 1
Descriptive Network Characteristics among the Children Rights Organizations' Offline, Hyperlink, and Twitter Following Network (N = 228).

	Offline Network	Hyperlink Network	Twitter Following Network
Edges	281	185	172
Density	0.54%	0.36%	0.34%
Reciprocity	4.98%	3.24%	5.81%
Transitivity	4.17%	17.80%	28.37%
Indegree Centralization	3.44%	4.55%	9.11%
Outdegree Centralization	59.63%	16.15%	12.27%

hypothesized parameters may shape the observed network configurations (Goodreau, 2007; see Robins et al., 2007 for a detailed view of the method).

In specifying the mode, we first included reciprocity—the extent to which a dyad of organization may have mutual ties, and cyclic triads—the parameter indicating triadic network structure (Robins et al., 2007)—as two endogenous structural variables for the purpose of control. The following parameters were included in the model to simultaneously test all hypotheses. To examine the effect of an organization's structural centrality (H1a), each organization's indegree centrality in the offline interorganizational network was included as a continuous nodal-level covariate. Consultative status was included as a categorical nodal-level covariate to test H1b. Organizational age was included as a continuous nodal-level attribute to test H2. Finally, to explore the extent to which geographic proximity drove tie formation across the three networks (H3), we included the region homophily matrix as a dyadic-level covariate to finalize the configuration of the three ERGM models.

The ERGM package in R was run to obtain parameter estimates from the specified models. The model fits the data when all parameters have convergence *t*-ratios less than 0.1, indicating that the standard error of each estimated parameter is within a tolerable range of the actual value of the parameter. Parameters are significant when the *t* values are within 1.96 standard errors of the parameters estimated by the model ($p < .05$; Robins et al., 2007, p. 32). Gephi (https://gephi.org/) was used to produce network visualizations and obtain descriptive network statistics.

5. Results

5.1. Descriptive analysis

The three interorganizational networks were first inspected for key structural features. Table 1 presents key characteristics of the three networks. The density of hyperlink network (0.36%) and Twitter's following network (0.34%) was lower than that of offline network (0.54%). In terms of the level of reciprocity, the measure that indicates the percentage of reciprocal dyads in the network, all three networks demonstrated a relatively low level of reciprocity (4.98% for offline network, 3.24% for hyperlink network, and 5.81% for Twitter following network). Meanwhile, the level of transitivity—the extent to which a network is characterized by transitive ties (Wasserman and Faust, 1994), is notably higher in the hyperlink (17.80%) and Twitter following (28.37%) network than in the offline network (4.17%). Finally, Twitter following network exhibited the highest level of indegree centralization (9.11%), suggesting that incoming ties were particularly more clustered around a cohesive group on Twitter compared to that on websites or offline. Meanwhile, due to the way offline relationships were collected (i.e., starting with a small group of seed organizations), offline network had a much higher level of outdegree centralization (59.63%), followed by hyperlink (16.15%) and Twitter following network (12.27%).

Fig. 1 provides the visualization of offline, hyperlink, and Twitter interorganizational networks. Across the three networks, UN agencies such as *the United Nations International Children's Emergency Fund (UNICEF)*, *the United Nations Educational, Scientific and Cultural Organization (UNESCO)* were consistently at the center of each network. Meanwhile, NGOs like *the Children Rights Connect*, an international NGO located in Geneva, also occupied a central location across all three networks. For the majority of other NGOs, however, there were greater variations in terms of how central (or well-connected) they were in each network. For example, *Human Rights Watch (HRW)*, an international human rights advocacy NGO, was well-connected and highly visible in the hyperlink network, but the same organization was at a more peripheral position in offline and Twitter following network.

5.2. Hypotheses testing

Table 2 provides estimates, standard errors, statistical significance, and conditional odds ratio of the ERGM model results from the three interorganizational networks. In the model, basic structural parameters such as edges and cyclic triplets were included as control variables. Hypotheses were indicated by corresponding nodal or edge-level parameters (for detailed glossary and computational specification of ERGMs, see Handcock et al., 2015). The final parameter estimates were obtained from a converged model, with all parameters' convergence *t*-ratio well below the critical value of 0.1 (Handcock et al., 2015). Across three networks, the control variables reciprocity (*Estimates* $= -0.18$, $p < .05$) emerged as a negative and significant predictor only in the Twitter following network, suggesting that the Twitter following relationships were especially not reciprocated. Meanwhile, cyclic triplets (*Estimates* $= -1.58$, $p < .001$), the measure of transitivity, only negatively and significantly characterized the offline network.

The first two hypotheses proposed that organizational status, indicated by an organization's offline indegree centrality (H1a),

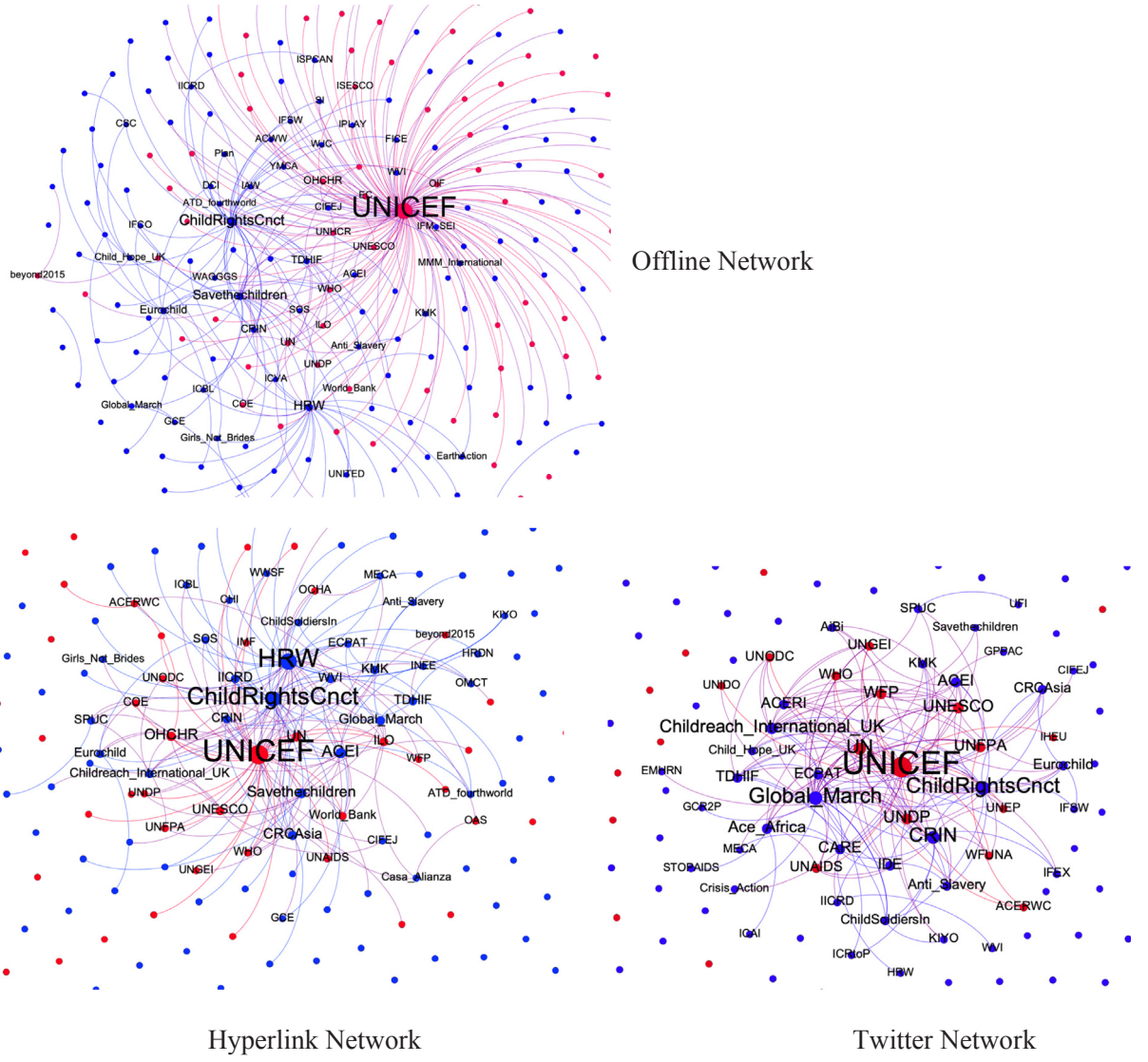

Fig. 1. The visualization of offline, hyperlink, and Twitter interorganizational network. Node size indicates indegree centrality, and node color indicates the type of organizations (Red = IGOs, Blue = NGOs). For the clarity of presentation, isolates are not included in the visualizations. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Table 2
Hypotheses Testing and Parameter Estimates from ERGM of Offline, Hyperlink, and Twitter Following network.

	Offline Network			Hyperlink Network			Twitter Following Network		
	Estimates	*s.e.*	*Odds Ratio*	*Estimates*	*s.e.*	*Odds Ratio*	*Estimates*	*s.e.*	*Odds Ratio*
Structural Effects									
Edges	−8.41***	0.29	−4491.76	−7.45***	0.31	1719.86	− 6.69***	0.28	−804.32
Reciprocity	-0.30	0.35	−1.35	0.32	0.50	1.38	-0.18*	0.77	−1.20
Cyclic triplets	−1.58***	0.43	−4.85	−1.02	0.70	−2.77	-0.91	1.08	−2.48
Hypothesized Effects									
H1a: Indegree centrality	0.67***	0.02	1.95	0.55***	0.03	1.73	0.49***	0.03	1.63
H1b: Consultative status	0.46**	0.16	1.58	0.62***	0.17	1.86	0.39*	0.17	1.48
H2: Organizational age	-0.00	0.00	−1.00	-0.00***	0.00	−1.00	-0.01***	0.00	−1.01
H3: Geographic proximity	0.32*	0.16	1.38	-0.23	0.16	−1.26	-0.20	0.17	−1.22
Control Variables									
IGO type	0.20	0.18	1.22	0.27	0.19	1.31	0.47*	0.19	1.60

consultative status (H1b), and organizational age (H2), more significantly predicted tie formation in the online networks. H1a was not supported because indegree centrality was significantly related to the likelihood of tie formation in all three networks (*Estimates* $_{offline} = 0.67$, $p < .001$; *Estimates* $_{hyperlink} = 0.55$, $p < .001$; *Estimates* $_{Twitter} = 0.49$, $p < .001$). A one-unit increase in indegree centrality increased the odds of having one offline relationship by 95%, and it similarly increased the chance of having an additional hyperlink tie by 73% and one Twitter following relationship by 63%. Furthermore, results showed that consultative status was a consistent predictor, where NGOs with consultative status were more likely to form ties with other organizations, regardless of the platform that sustained such relationships (*Estimates* $_{offline} = 0.46$, $p < .01$; *Estimates* $_{hyperlink} = 0.62$, $p < .001$; *Estimates* $_{Twitter} = 0.39$, $p < .05$). Compared to NGOs that did not have consultative status, organizations with consultative status were more likely to develop offline relationships at a rate of 58%, gain hyperlink relationships at a rate of 86%, and gain Twitter following relationships at a rate of 48%. Therefore, H1b was not supported either.

In terms of the effect of organizational age (H2), although there was platform-specific divergence, findings were contrary to what was hypothesized. In the offline interorganizational network, age was not a significant predictor. In the hyperlink and Twitter following network, however, organizational age negatively predicted the likelihood of tie formation (*Estimates* $_{hyperlink} = -0.00$, $p < .001$; *Estimates* $_{Twitter} = -0.01$ $p < .001$), suggesting that younger organizations were slightly more likely to develop hyperlinks and follow other organizations on Twitter. Therefore, compared to organizations that are one-year older, the younger counterparts are more likely to develop a Twitter following relationship at a rate of 1%, and the effect on developing hyperlink relationships, though significant, was quite minimal at a rate less than 1%.

H3 explored the role of geographic proximity in forming interorganizational ties across multiple platforms, and this hypothesis was fully supported. In the offline network, organizations that operated in the same region were far more likely to have offline interorganizational connections (*Estimates* $_{offline} = 0.32$, $p < .05$), suggesting that sharing the same geographic region increased the likelihood of having offline ties by 38%. On the other hand, the significant effect was not observed in hyperlink or Twitter following networks, indicating that geographic homophily did not significantly impact the formation of hyperlink or following relations on Twitter.

6. Discussion

Guided by the institutional theory and resource dependence theory, this study examines whether and how technology platforms support children's rights NGOs' relationship building beyond sustaining offline interorganizational connections. Viewing NGOs' offline, hyperlink, and Twitter following connections as relationships fulfilling different functions, the current study identifies a number of structural characteristics and connection logics specific to each platform. First, contrary to the prediction, the status-seeking logic emerges as a consistent and significant tie formation logic in all three networks. However, the network modeling results show that such logic primarily operates through the symbolic status of an organization such as one's structural position in the offline interorganizational network (H1a) and prestige (H1b). However, organizational age (H2), which is a well-recognized indicator of organizational experience and their access to normative information (Margolin et al., 2015), negatively predicts one's likelihood of gaining hyperlink connections or following relationships. In other words, we find that in the children's rights organizational community, older organizations do not necessarily enjoy relational advantages in the online sphere.

The finding that organizational age is negatively related to online relationship building may be explained by the relatively lower rates of adoption of communication technologies among older and more established organizations. An ad-hoc analysis shows that the 376 organizations with official websites ($M = 55.39$, $SD = 46.06$) are on average 11.53 years younger than those that do not have any online profiles ($M = 66.92$, $SD = 72.26$, $t\,(412) = 4.096$, $p = .044$). Such finding is rather consistent with existing literatures on technology adoption, where younger individuals and organizations are found to be more receptive to new communication technologies (e.g., Chung et al., 2010; Lee, 2004). As older organizations tend to face greater inertia in adopting new organizing practices (Carroll and Hannan, 2000), this tendency is well reflected in our analysis and it partially explains why older organizations do not develop as many online connections despite of their high legitimacy status.

On the other hand, organizations' structural centrality in the offline interorganizational network as well as NGOs' consultative status emerge as two significant predictors across both offline and online networks. To some extent, this finding suggests that an organization's network position offline is able to carry over to the online sphere, as central organizations in the offline network are also significantly more likely to develop hyperlinks. Such a finding is particularly meaningful for the mobilization of collective action, as hyperlinks have been identified to facilitate organizational outreach and the building of like-minded communities (e.g., Kropczynski and Nah, 2011; Shumate and Lipp, 2008). Because central organizations are more likely to develop hyperlinks with others, it thus indicates that it would be most effective to start the mobilization efforts from the leader or central organizations in a community. Meanwhile, consultative status, an organization-level attribute, plays a significant role in developing connections in both offline and online contexts. As Atouba and Shumate (2015) note, consultative status not only provides NGOs with "some degree of international recognition but also constitutes an opportunity to influence the decision-making process at the international level." (p. 593). Our finding thus further illustrates the importance of having consultative status in accumulating "connective public goods" and gaining relational advantages for NGOs.

Findings further suggest that geographic proximity differently impacts the formation of offline versus online interorganizational relationships. While geographic proximity remains a strong predictor of NGOs' offline interorganizational relationships, our results show that this mechanism does not significantly affect the formation of hyperlink or Twitter's follower-followee ties. This finding indicates that the internet may indeed afford the opportunity for NGOs to reach geographically distant others online. It also reaffirms the importance of treating offline, hyperlink, and Twitter following relationships as distinctive interorganizational relationships. In

addition to the different natures of offline versus online relationships (i.e., resource exchange vs. representational), the cost of building each type of ties may also differ considerably. Compared to offline relationships, forming hyperlink or Twitter-based relationships usually does not involve direct resource exchanges, and it thus requires less effort in terms of mobilizing financial or human capital. Once again, our results suggest that the conditions necessary for the formation of online relationships are likely to differ from those for the offline relationship, and geographic proximity is one of the conditions that is more crucial in the offline than in the online context.

These findings warrant further investigation regarding the potential interaction between offline and online relationships. More research is needed to identify the effect of offline relationships on online relationship building (or vice versa) and the additive value of online relationships to offline partnerships. It is possible that having relationships across online and offline sphere means stronger alliances than having only a single type of relationship.

6.1. Practical implications for NGOs to build alliances online

With multiple technology platforms becoming more accessible for organizations today, the current study offers several implications for building strategic alliances using these platforms. First, young and less-established NGOs should more proactively take advantage of online platforms to connect with others—especially influential organizations in the community. Although studies indicate that technology does not fundamentally change the reality where global attention still heavily skews towards a few large and well-funded NGOs (Thrall et al., 2014), our study shows that online platforms can still benefit small or "resource-poor" organizations to reach geographically distant others online, even when they can only afford limited outreach effort offline. A hyperlink or Twitter following relation may not equate to an actual collaborative relationship, but it can provide organizations with opportunities to engage in the global dialogue of a social issue and gain visibility in the community. This could pave the way for building future offline alliances.

Second, as online and offline interorganizational relationships fulfill different functions, NGOs aiming to leverage multiple platforms should be more mindful to match different relational goals with specific platforms. For example, hyperlink connections can be best used to communicate long-term commitment or identity of an organization, serving as a stable virtual roadmap for a group of like-minded alliance partners; whereas Twitter relationships, due to their dynamic nature, may be best used to communicate ad-hoc alliances following emerging collective action. The recent child refugee crisis is a prime example where nonprofit and advocacy organizations around the global used Twitter to effectively communicate solidarity and event-specific alliances (Gualda and Rebollo, 2016).

7. Conclusion

By comparing children's rights organizations' offline, hyperlink, and Twitter following networks, this study contributes to the current research literature on NGO networking in three ways. First, it delineates different functions served by NGOs' hyperlink and Twitter follower-followee relationships, providing a more nuanced understanding of NGOs' interorganizational relationship building across major technological platforms. While a number of existing studies have independently examined these relationships (e.g., Lovejoy et al., 2012; Seo et al., 2009), few bring them together and systematically draw the comparison. Second, this study uses a network modeling approach to identify how each network's structural features are differently shaped by various connection logics. Current findings thus provide an important first step in uncovering key mechanisms that govern the process of interorganizational tie formation. To more comprehensively understand forces related to NGO alliance communication, future work is encouraged to explore other determinants or derive hypotheses from other theoretical perspectives, such as strategic public relations or organizations' self-presentation management. Finally, this study combines an institutional theory and a resource dependence theory to understand relationship building processes across different technology platforms. Regarding legitimacy-seeking, the finding that organizational age is not related to organizations' online relationship building implies that young organizations' early adoption of new communication technologies, in a way, may buffer the "the liability of newness"—that is, the disadvantages associated with being a new organization in the community—in terms of developing interorganizational connections.

We conclude with a few limitations and suggestions for future research. In the current study, we focus on the community of children's rights organizations and all the hypotheses are tested on this specific organizational population. Although the goal is to understand the general mechanisms related to NGO networking, our sample may limit the extent to which the current findings can be generalized. Along this line, future work may replicate the current analysis on a different community of NGOs. Second, in addition to examining how various types of interorganizational relationships differ, it is also important to take a granular approach and examine how multiple interorganizational relationships may supplement and interact with one another. It is likely that organizations having multiple relationships form stronger alliances than those that have only one type of relationship. Finally, the decision of examining relationship building on Twitter is based on its relatively high rate of adoption among organizations. However, with the ever-changing social media landscape, it is likely that other forms of platform may gain greater popularity among NGOs. Future work may extend the investigation to other social media platforms. As different technological features are associated with different affordances, the next phase of studies may explore multiple social media platforms to identify characteristics that are unique to each technological feature. Findings from this direction may offer direct implications to NGOs in terms of what social media platform can best manage interorganizational relationships and leverage their relational connections. This research is particularly valuable as NGOs have significantly increased their networking in recent years, and networking has become a more significant tool for accomplishing NGO goals.

8. Author note

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Declaration of Competing Interest

None.

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