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## Network measures to evaluate stakeholder engagement with nonprofit organizations on social networking sites



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## ABSTRACT

This paper introduces and validates two network measures for evaluating stakeholder engagement on social networking sites (SNSs) that nonprofit organizations (NPOs) use. Based on egocentric networks of the top 100 U.S. nonprofits' Twitter accounts, the first network measure captures two-way communication between organizations and the stakeholders. The second network measure captures communication among stakeholders, which can develop into autonomous communities to support the organization.

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Social networking sites (SNSs) have engendered new opportunities for nonprofit organizations (NPOs) in terms of transparency, dissemination of information, and involvement with stakeholders (Lovejoy, Waters, & Saxton, 2012). Specifically, generating deep engagement with stakeholders has been regarded as the most prominent potential application of SNSs for NPOs, because this engagement can further facilitate collective action in the community or lead to greater social impact (Aaker & Smith, 2010).

To evaluate such stakeholder engagement on organizations' SNS pages, studies have used hit counts on SNSs, which are based on the number of *Followers*, *Likes*, or *Tweets* (Lovejoy et al., 2012). However, such measures fail to capture the two-way communication between organizations and stakeholders, a key element in modern public relations model (Grunig & Huang, 2000). Further, existing measures do not account for the interactivity among stakeholders on organizations' SNS pages, even though such interactivity may be a precursor to autonomous communities operating on behalf of the organization (Aaker & Smith, 2010).

In response to the limitations of the existing measures, the purpose of this paper is to introduce two network measures that capture meaningful two-way communication between organizations and their stakeholders (Organization-Stakeholder Interactivity Measure (OS)) and among stakeholders (Stakeholder Community Measure (SS)). The paper validates each measure by examining its discriminant validity compared to existing online measures (*Followers*, *Following*, and *Accumulated Tweets*) and its concurrent validity compared to existing organizational measures (*Cone Power Brand Ranking* and *Brand Image Ranking*; Cone Communication, 2009).

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## 1. Method

This study's data were drawn from one week activities (from October 13, 2013 to October 19, 2013) of Twitter accounts of the top 100 Cone Nonprofit Power Brand NPOs in the United States (Cone Communication, 2009). The organizations' *Reply* to and *Repost* of stakeholders on their Twitter accounts were gathered by accessing Twitter API (Yang, 2013). Additionally, the author also collected and coded stakeholders' *Reply* entries on the organizations' Twitter accounts.<sup>1</sup> Finally, the existing online measures (*Followers*, *Following*, and *Accumulated Tweets*) and a number of *Active Stakeholder* were collected from the organizations' Twitter accounts. A detailed explanation of each component follows.

After collecting the data, this paper first conducted a social network analysis of organizations' and stakeholders' Twitter activities to acquire the two network measures<sup>2</sup>. The first network measure was *Organization–Stakeholder Interactivity Measure* of an organization  $k$  ( $OS_k$ ). This paper defines  $OS_k$  as the sum of the standardized value of *Reply* and *Repost* by stakeholders and the organization as well as active stakeholders in the organization  $k$ 's SNS page:

$$OS_k = Z(Reply_k) + Z(Repost_k) + Z(Active Stakeholder_k)$$

*Reply* indicates the number of posts from both a stakeholder and the focal organization replying directly to each other in public on the organization's SNS page, which represents responsiveness and two-way communication between organization and stakeholder. *Repost* is an activity of sharing publicly another user's post with an acknowledgment of the original content creator in public. *Active Stakeholder* is measured by counting the number of stakeholders who have ever posted anything on an organization's SNS page. It is a more accurate measure of the number of stakeholders than *Followers* or *Friends*, because it captures actual participants who post on an organization's SNS account.

Different from the existing hit-count measures, each component of  $OS_k$  captures the number of reposts and responses between organization and stakeholder, not a one-time support between them. Specifically, the measure precludes a one-way communication, such as an organization's posts of disseminating information or advertisement without replying to and engaging stakeholders. High  $OS_k$  suggests an active two-way communication between organization and stakeholder on the organization's SNS account.

The second network measure was *Stakeholder Community Measure* of an organization  $k$  ( $SS_k$ ). This paper defines  $SS_k$  as the sum of the standardized value of *Density Among Stakeholders* ( $DS$ ) and *Average Degree Centrality Among Stakeholders* ( $CS$ ):

$$SS_k = Z(DS_k) + Z(CS_k)$$

$DS$  is a ratio that compares the number of SNS postings connecting active stakeholders on an organization's account to the maximum number of possible SNS postings if all stakeholders were connected to all other stakeholders.  $CS$  measures the average number of postings connecting active stakeholders.

$SS_k$  uniquely captures stakeholder-to-stakeholder interactivity, a precursor to strong online communities, but overlooked by previous measures. Numerous postings connecting stakeholders indicates high autonomous stakeholder interactivity. It is the first step toward the formation of an autonomous stakeholder community acting on behalf of the focal organization.

To examine the two network measures' discriminant validity against the existing online measures, an exploratory factor analysis was conducted using Varimax rotation. For the concurrent validity of the *Organization–Stakeholder Interactivity Measure*, all variables that met the 0.4 loading criterion were standardized. The variables within  $OS_k$  factor were standardized and added so that each variable could be appropriately represented in the factor. A Spearman correlation analysis was conducted between the existing organization measures and  $OS_k$ .

## 2. Results

### 2.1. Discriminant validity

Every component of three measures ( $OS_k$ ,  $SS_k$ , and *Existing Online Measure*), except for *Follower*, loaded separately to three factors ( $OS_k$ : Factor 1,  $SS_k$ : Factor 2, and *Existing Online Measure*: Factor 3) at a level of 0.4 criterion and with eigenvalues above 1.03. *Follower* loaded onto both factors 1 and 3, which might have been caused by a close relationship between *Active Stakeholder* and *Follower*. This model explained 80.53% of variance. Therefore, the two network measures capture distinct SNS activities.

<sup>1</sup> The author of this paper classified *Reply* and *Repost* on Twitter by capturing messages starting with "@[indicated counterpart name]" and "RT@[content creator name]," respectively. The author excluded stakeholders' *Repost* entries, because the number of *Repost* entries indicated on SNS pages does not always exclude reposting by the organization's indirect stakeholders, such as *Followers* of the stakeholders.

<sup>2</sup> Outliers not within the range of three standard deviations were excluded from the analysis.

## 2.2. Concurrent validity

This paper posits that  $OS_k$  would be positively correlated to existing organizational measures (*Cone Power Brand Ranking* and *Brand Image Ranking*; Cone Communication, 2009), based on the assumption that stakeholders and organizations become more interactive when the organizations have a good brand image worthy of engaging (represented by *Brand Image Ranking*) and a capacity to manage their accounts and host events (represented by *Cone Power Brand Ranking*) (Hoffman & Fodor, 2010). A significant, positive correlation was found between the  $OS_k$  and *Cone Power Brand Ranking* ( $\rho = .26, p < .01$ ) as well as *Brand Image Ranking* ( $\rho = .28, p < .01$ ). The positive correlation supports concurrent validity of  $OS_k$ . The correlation indicates that  $OS_k$  concurrently aligns with the general evaluation of the organization. An SNS account is not completely separate from its NPO's general activities; rather, the account is a continuum of the organization's strategies for stakeholder engagement. The modest coefficient values (0.26), on the other hand, indicate that  $OS_k$  also captures different dimensions from the existing organization measures.

## 3. Conclusion

This study introduced two network measures to evaluate NPOs' stakeholder engagement on SNS accounts and validated these measures by comparing them to two existing measures. In contrast to the current measures capturing a one-time stakeholder support of an organization (e.g., *Following*, *Friends*),  $OS_k$  captures the level of two-way communication between organizations and stakeholders (Grunig & Huang, 2000; Lovejoy et al., 2012).  $SS_k$  also uniquely captures interactions among stakeholders, which directs attention from two-way communication (Grunig & Huang, 2000) to stakeholders' autonomous communication.

These measures extend the public relations scholarship by operationalizing two distinct engagement activities on SNS.  $SS_k$  draws attention to an under-theorized realm of relationship-management scholarship, the relationships among stakeholders. Autonomous communities represent a new potential for public relations practitioners to catalyze independent advocates for their organization. More research is needed to understand the practices and consequences of this unique engagement strategy. In combination, these measures paint a more comprehensive picture of public relations effectiveness on social networking sites.

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