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Measuring international relations in social media conversations

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ABSTRACT

This paper examines international relations as perceived by the public in their social media conversations. It examines over 1.8 billion Facebook postings in English and 51 million Chinese posts on Weibo, to reveal the relations among nations as expressed in social media conversations. It argues that social media represent a transnational electronic public sphere, in which public discussions reveal characteristics of international relations as perceived by a foreign public. The findings show that the international relations in social media postings match the core-peripheral structure proposed in the World Systems Theory. Additionally, the relations are associated with the amount of news coverage and public attention a country receives. Overall, the study demonstrates the value of webometric data in revealing how international relations are perceived by average citizens.

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1. Introduction

The idea of *public sphere*, first proposed by Habermas (1989), states that there is “a constellation of communication spaces in society that permit the circulation of information, ideas that facilitate debate leading to the formation of public opinion” (Dahlgren, 2005, p.148). Increasingly, the public sphere has taken a virtual format in various Internet forums and social media outlets. Scholars use “electronic public sphere” or “global social media sphere” to describe its resemblance to a transnational public sphere for socio-political-cultural discourse (Castells, 2008; Volkmer, 2003). The public sphere is a rich ground for studying public opinion. In particular, the word-of-mouth within the public sphere helps researchers understand how opinions spreads (Haralabopoulos & Anagnostopoulos, 2015; Golan & Himelboim, 2015; Jalilvand, 2012; Jansen, Zhang, Sobel, & Chowdury, 2009; Xu, Park, & Park, 2015; Xu, Park, Kim, & Park, 2016), and how shared narratives and identities connect the public (Papacharissi & de Fatima Oliveira, 2012). In this paper, we turn to discourses on the public sphere for another type of insight. That is, the importance of and the interlinkage among various countries/regions. Using network analysis, this kind of

insights can be inferred from how different countries are mentioned in public conversations. This approach provides a new angle in studies of international relations. To introduce the new approach, the paper is organized as follows: It first reviews prior studies to link public diplomacy to social media. It then introduces how network analysis can be applied to study international relations. Next, the value of network analysis in revealing international relations is demonstrated to form the basis of the research questions explored in the study.

2. Literature review

2.1. Mining social media conversations for public diplomacy

Public diplomacy is the establishment and maintenance of international ties through citizen-to-citizen communication (Signitzer & Coombs, 1992). Castells (2008) discussed public diplomacy in terms of global communication networks and the development of shared meanings. The goal of public diplomacy is to generate favorable ties with foreign public through dialog and collaborations, emphasizing two-way communications of ideas, values and opinions. National governments can strategically use global trade, tourism and cultural exchange to promote national images. Social media provide a new frontier for carrying out such strategic operation. National governments and diplomats have adopted digital media to facilitate outreach (Fisher, 2010; Mergel, 2013; Slaughter, 2009). For example, U.S. embassies and consulates use Twitter tweets to connect with foreign nationals (Zhong & Lu,

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2013). In recent years, public diplomacy efforts increasingly involve the use of digital data. For example, the U.S. Department of State has been promoting the use of crowdsourced mapping to help humanitarian aids in foreign countries (Campbell, 2014). This is a part of the open data initiative in which governments provide public access to large datasets to facilitate crowdsourcing solutions to community-wide problems (Kassen, 2013). Like other government branches and public institutions that use social media data to predict public opinion (Sobkowicz, Kaschesky, & Bouchard, 2012), public diplomacy also involves opinion mining: The State Department's US Digital Outreach Team, for example, disseminates bi-weekly brief summarizing what people talk about online (Khatib, Dutton, & Thelwall, 2012).

Opinion mining is based on the premise that social media and other internet platforms provide an extra-societal, transnational public sphere where dialog and collective actions shape a global narrative on politics (Castells, 2008; van Dijk, 2012; Volkmer, 2003). In the everyday topics of social media conversations, names of foreign countries are expected to be mentioned in different contexts, from discussions related to regional conflicts, global economy to topics of travel destinations and movie releases. How the public discusses foreign countries reveals important insights about public perception of foreign countries. In this paper, we argue that social media conversations provide fruitful ground for understanding the structure of international relations. Such understanding can enhance public diplomacy efforts.

Previous studies of public diplomacy mostly focus on examining institutions' use of social media for public diplomatic outreach (Burns & Eltham, 2009; Zhong & Lu, 2013). But, such a perspective is one-sided. Public diplomacy is as much about outreach as understanding what citizens are talking about, in particular, how foreign countries are perceived to be connected. Therefore, the current paper provides a new direction to the literature by using social media data to understand how citizens perceive the importance and relevancy of various foreign countries. Specifically, this research direction requires examining the structure of international relations as they reveal important power dynamics in geopolitics (Lake, 2009).

The use of such data for understanding society and human behavior is increasingly prevalent in the social sciences (Borgman, 2015; Mayer-Schomberger & Cukier, 2013; Park & Leydesdorff, 2013) and policy-making processes (Struijs, Braaksmā, & Dass, 2014). The field of webometrics, which is the quantitative measure of internet communication, is emerging and provides critical online behavior insights for decision-making and management (Jung & Park, 2016). This kind of investigation is also facilitated by the availability of open tools such as the Google's Trends, Location History, Correlate services, and NodeXL that can easily access online presence data and map out structure in online content (Meier, 2016; Smith, 2015).

2.2. Applying network analysis to international relations

International relations can be expressed in network linkages. In mapping the network of nations, a country is represented by a *node* and its *links* with other countries. The linkages may be based on commodity trade, diplomatic ties, military intervention, treaty membership, telecommunications, airline traffics, monetary flows, and student exchanges. The structure of the network reveals the current geopolitical power dynamics. For example, using Internet bandwidth capacity, hyper-link connections, website use, and website ownership as proxy measures, Barnett and his colleagues showed a core-peripheral structure (Barnett, 2001; Kim & Barnett, 1996; Barnett & Park, 2014; Ruiz & Barnett, 2014; Barnett, Ruiz, Xu, Park, & Park, 2016). They concluded that the globalized cyberspace is characterized by an unequal exchange between powerful information rich and information poor countries, which has led researchers to question whether cyberspace is truly boundary-less and independent from the geopolitical reality on the ground.

We use a similar approach to reveal the geopolitical structure based on citizens' perception of foreign countries. Specifically, we can picture

different nations woven into a network. Two nations are connected when they appear in the same social media posts. The basis for such network ties is called co-occurrence. Examples of co-occurrence include mutual membership in groups, such as international governmental organizations (Kim & Barnett, 2000), co-participating in events (international conferences), proximity in physical distances, and similarities in attributes (e.g., political views) (Borgatti, Everett, & Johnson, 2013). Co-occurrence is also widely observed in webometric data. For example, prior studies examine semantic networks based on co-occurrence of words in various social media posts (Kim, Heo, Choi, & Park, 2014; Shapiro & Park, 2015; Xu et al., 2015, 2016; Park, Lim, & Park, 2015). Co-occurrence of words can reveal thematic/topic similarity and variation in online public discussions of issues (Heo, Park, Kim, & Park, 2016), or the media's framing of international events (Jiang, Barnett, & Taylor, 2016). In the current study, a network of nations based on co-occurrence reflects how the public perceives the connection between two given countries in a semantic context.

With the network of nations based on co-occurrence, we can analyze its structural features using network analysis, which is a set of research methods for identifying structures and patterns in communication and associations among connected actors (Wasserman & Faust, 1994). Network analysis has been widely used in academic studies of international relations and cross-cultural communication (see Barnett & Park, 2005, 2014; Chang, Himelboim, & Dong, 2009; Kim & Barnett, 2000; Kim & Barnett, 2007; Rosen, Barnett, & Kim, 2011; Segev, Sheafer, & Shenhav, 2013; Park, Barnett, & Chung, 2011). In addition, network analysis has been used in the public sector to bridge the gap between practice and planning (Guhāa & Chakrabartib, 2014).

Broadly speaking, network analysis produces two levels of insights. The first, concerns the nodes' positions in a network. Centrality is an indication of how central a node is in a network (Freeman, 1979). Accordingly, centrality is a proxy measure for popularity, salience and influence (Freeman, 1979). In a network based on co-occurrence, high centrality means a high degree of salience and visibility of a semantic concept or entity in conversations (Doerfel & Connaughton, 2009). Various prior studies have used this approach to identify import themes in public discussions online (Oh, Kwon, & Rao, 2010; Veltri, 2012). Accordingly, in a network based on co-occurrence of country names, countries with a high degree of centrality are considered highly salient and visible. Therefore, the first research question asks what countries are the most salient and visible based on network centrality.

RQ1: What countries are the most salient in the network based on co-occurrence of country name in social media?

The second level of insights concerns the general structure of a network. For example, clustering is one such structural characteristics. It indicates divisions and separation among entities (Watts & Strogatz, 1998). In prior studies, clustering is used to identify political and ideological divides (Kim, Barnett, & Kwon, 2010; Himelboim, McCreery, & Smith, 2013; Gruzd & Roy, 2014). Too much clustering can create blockages in the free flow of information, limiting the scope and variety of influence (Granovetter, 1983). In a network based on co-occurrence of words, clustering indicates convergence and divergence of concepts and topics. By the same token, in a network comprised of different nations based on co-occurrence of their names, clustering shows what countries tend to be mentioned together in the same context. Therefore, the second research question addresses this network characteristic in the co-occurrence network investigated in the study.

RQ2: What is the structure of international relations reflected in the clustering in the network based on co-occurrence of country name in social media?

Since the kind of international relations investigated in the study are based on perception of citizens, such perceptions arguably are shaped by multiple forces. In this globalized world, many of our perception

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