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Power in politically charged networks

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ABSTRACT

We offer a theory and measure for determining powerful nodal positions based on potential inter-actor control in "politically charged" networks, which contain both allies and adversaries. Power is derived from actors that are dependent on the focal actor and sociometrically weak, either due to a lack of alternative allies or from being threatened by others. We create a new Political Independence Index (PII), compare it to other established measures, and illustrate its use in the setting of an international network of alliances and military conflicts from 1946 to 2000. Results show that politically independent nations as measured by PII have smaller increases in military personnel than others over time.

1. Introduction

A central issue in understanding any type of network – whether comprised of individuals, groups, organizations, or even nations – is recognizing which actor in the network has power. The ability of an actor to influence other actors into doing what they might not otherwise do, or to avoid being influenced in such a manner, affects many aspects of the actors' behaviors and outcomes. Researchers attempting to identify powerful actors often focus on the actor's attributes – the actor's characteristics or the actor's formal roles in the organization or network that can create power differentials between actors (French and Raven, 1968) – or on behavioral power strategies and tactics that actors use to gain influence (Kipnis et al., 1980; Ferris et al., 2007). However, power is inherently a structural phenomenon where one actor's influence over another needs to be considered within a wider network of relationships (Pfeffer, 1981; McClurg and Young, 2011). "Being in the right place" in the network is strongly related to power because certain network positions allow the actors to have more *access* to resources flowing through the network, or more *control* over these flows based on how dependent other actors are on the focal actor (Brass, 1984).

Most of the research conducted from this structural perspective on power has focused on networks where the flows are assumed to be either positive or neutral. For example, researchers at the interpersonal level have studied how positions in positive networks determine which actors have access to diverse, useful and trusted information that can lead to power in organizations (e.g., Brass, 1984; Burkhardt and Brass, 1990; Sparrowe and Liden, 2005) or that can enhance their performance or creativity (e.g., Burt, 2004, 2010). Similarly, researchers of international networks have examined how dependence in terms of international trade or mutual alliance ties, or being structurally equivalent in these positive-tie networks, can affect whether two countries end up in conflict (e.g., Maoz, 2006; Maoz et al., 2006). However, little attention has been devoted to actors and flows that might constitute active threats to other network actors (e.g., Maoz, 2004; Tita and Radil, 2011).

We contribute to the literature on political networks (Lazer, 2011) by presenting a theory and a measure for determining powerful positions based on control in "politically charged" networks where actors can have *both* allies and adversaries. This theory's boundary conditions are that the actors are attempting to achieve some goals and are embedded in networks with both potential allies and adversaries. These politically charged networks include actors actively vying for preeminence by both enhancing their own position while also potentially subverting another's outcomes (e.g., Siegel, 2007). We argue that allies and adversaries are inextricably linked – soliciting an ally is done for the specific purpose of countering the potential threats created by adversaries. Thus these relationships should be studied as part of a greater network whole as opposed to separate relational networks. Many real-world networks have these types of negative, adversarial, or threatening ties that seek to undermine the flows or interactions within the network, and also contain coalitions and counter-coalitions of allies (Labianca et al., 1998; Labianca and Brass, 2006; Murnighan and Brass, 1991; Maoz et al., 2007) suggesting a need to alter existing theory and methods to identify powerful positions.

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Our approach considers an actor's position within the entire network of allies and adversaries and relies on the following general principle: being allied with actors who are themselves under threat increases the focal actor's potential power because those allies become dependent on the focal actor for resources and support. Our goal is to lay out a theory of actor positional power based on inter-actor control in networks of allies and adversaries that can act as a complement to the power-as-access approach that is often used in studying these networks. We introduce a new network power measure – the Political Independence Index (PII) – which we compare to existing measures on an international network of military alliances and conflicts (drawn from the Correlates of War project; Ghosn et al., 2004; Ghosn and Bennett, 2003). We argue that researchers interested in understanding positional power in politically charged networks at a particular point in time should include measures whose underlying mechanisms are theorized to capture power-as-access (e.g., Bonacich power centrality with a positive beta) along with the PII, which captures power-as-control (see Section 7 of this paper for more on using PII).

2. Underlying sources of network positional power

In attempting to understand which positions in a network are more powerful than others, theorists have focused on the actor's potential to do two things: a. *access* resources through networks flows; or b. *control* those same resources by having other actors remain dependent on the focal actor (Brass, 1984). Our goal is to focus on the latter control-driven sources within a politically charged network setting while recognizing that access-driven sources of network positional power are important as well and must be accounted for empirically. We describe both mechanisms below.

2.1. Power-as-access approach

The power-as-access approach focuses on the actor's potential to access other actors' resources through the actor's position in the network. The sheer volume of other actors to which the focal actor is tied is often considered indicative of that actor's potential to access and assemble those resources in a manner that makes them valuable to others, and hence makes the actor powerful (Brass and Burkhardt, 1993). This is often measured through degree centrality, the number of other actors the focal actor is tied to directly (Freeman, 1979) – for example, a nation's number of international alliances. Other centrality measures consider indirect ties and illustrate how the actor has the potential to indirectly reach others and "catch" network flows. Actors high in closeness centrality are more powerful because they have a low average number of steps or ties to access other actors in the network (Brass, 1984). Actors high in eigenvector centrality or Bonacich power centrality (when applying a positive beta) are tied to others who have high degree centrality and thus can also have access to network flows through their indirect connections without the need to directly maintain those ties (Bonacich, 1987; Bonacich and Lloyd, 2004; see Hafner-Burton et al., 2009, for applications in political networks).

The power-as-access perspective typically assumes that all ties are positive (or at least neutral), and actors allow for the flow of resources, such as vital information, to continue unimpeded through the network. But the essence of politically charged networks is the recognition that some actors in the network might be adversaries who actively attempt to undermine others or inject harmful flows into the network. We use the terms "threats," "adversaries," and "negative ties" interchangeably to refer to relationships where at least one actor has adopted a relatively stable pattern of negative evaluations (e.g., dislike, negative judgments or feelings) for the other and possibly an intention to disrupt or thwart that party's outcomes. Power-as-access ideas might also apply to injurious flows and disinformation flowing through negative ties. Consider how this might apply to international political networks: as Iran attempts to build its domestic nuclear industry with an alleged eye toward developing a nuclear weapon, the United States and Israel, its adversaries, are alleged to be introducing faulty software into their program's equipment supplier network in an attempt to forestall Iran's ambitions (Broad et al., 2011). This, in turn, motivates Iran to find many like-minded allies to oppose the U.S. and Israel. Thus, it becomes important to understand both allies, which are a source of positive, useful flows (e.g., Maoz, 2004), as well as adversaries, which can be a source of negative, detrimental flows (e.g., Read, 1954). This intuitive understanding of power is reflected in how politicians decide whether to run for office by examining not only how many probable voters would cast a vote in favor of them, but how their candidacy might mobilize voters to organize to vote *against* them (e.g., Stonecash, 2008). Thus, we believe that researchers of politically charged networks need to account for an actor's degree centrality among both allies and adversaries, as well as consider indirect ties using measures such as Bonacich power centrality with a positive beta, eigenvector centrality, or a localized decomposition of eigenvector centrality termed derived centrality (see Appendix A for more on these measures). Without understanding both the positive and negative entries in this social ledger (Labianca and Brass, 2006), we get an incomplete picture of an actor's potential power.

2.2. Power-as-control approach

While the power-as-access approach is important, the control or dependence approach is also critical for understanding actor power, especially in politically charged networks. This approach recognizes that when a focal actor is dependent on another actor for resources, that other actor has potential power over the focal actor (Emerson, 1962, 1972). Conversely, the focal actor can become more powerful by decreasing his dependence on the other through developing alternative sources for acquiring the needed resources (e.g., forming ties with other actors in the network). Thus, the focal actor's political independence or security is enhanced by having alternatives (Willer et al., 2002; Cook and Yamagishi, 1992) and minimized by others' ability to control the flows that ultimately reach the actor.

The ability of an actor to control the flows reaching other actors is one of the underlying mechanisms cited for the power of the broker's position in a structural hole. The broker, by virtue of being the intermediary between two otherwise disconnected actors, has control over the flows between them. Burt's (1992) measure of constraint is most typically used to measure this concept, and it considers, in part, the extent to which an actor is dependent on a single other actor for access to otherwise disconnected alters. The measure considers an actor's local egocentric network – that is, only the focal actor, the actors to which it is tied directly, and whether those actors are themselves tied. As it has been used traditionally, the measure does not reach beyond the local network level to consider the actor's position within the entire network (Burt, 2007).[1]

Betweenness centrality considers the whole network to determine how often a particular actor lies on the shortest path between any other two actors in the network. If we imagine various flows and exchanges traveling through a network, betweenness captures

[1] The UCINET network analysis program allows researchers to consider more of the network when calculating constraint, though this option is rarely used in practice.