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Comparative configurational analysis as a two-mode network problem: A study of terrorist group engagement in the drug trade

Ronald L. Breiger[a,*], Eric Schoon[a], David Melamed[b], Victor Asal[c], R. Karl Rethemeyer[d]

[a] School of Sociology, University of Arizona, Tucson, AZ 85721, United States
[b] Department of Sociology, University of South Carolina, Columbia, SC 29208, United States
[c] Department of Political Science, Rockefeller College of Public Affairs and Policy, University at Albany, Albany, NY 12222, United States
[d] Department of Public Administration and Policy, Rockefeller College of Public Affairs and Policy, University at Albany, Albany, NY 12222, United States

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ABSTRACT

We generalize a form of two-mode network analysis to make it applicable to a cases-by-variables data format, and apply our approach for the study of terrorist group engagement in the drug trade, emphasizing the implications of our approach for policy in a study of 395 terrorist organizations. Based on the organizations' levels of resources, network connectivity to other groups, ideological emphasis, and participation in multiple illicit economies, we identify several distinctive configurations of factors that lead to multiple types of drug activity. We also demonstrate a technique for assessing sampling variability in configurational models.

1. Introduction

The nexus of drugs and terrorism as a problem in political networks has been addressed from several different angles of research. First, because terrorist groups in general often use violence and intimidation to challenge, compete with, attack, or provide alternatives to the political authority of states, analysts view terrorism as a distinctive and consequential form of political violence, and are continuing to shape network analysis methods to study it (Perliger and Pedahzur, 2011). Second, different kinds of network structure and context carry differing implications for how terrorist networks strive for resilience, including when and how such groups may combine drug-related and other forms of illicit activity with nationalist or other political motives (Bakker et al., 2012). These varying approaches to resilience in turn have implications for counterterrorism policies (Milward and Raab, 2006, 2009). Roberts and Everton (2011; Everton, 2012) set forth an agenda along with much specific guidance and examples for embedding social network analysis techniques and interpretation of their output within larger strategic and theoretical frameworks for countering illegal and covert networks. Third, as emphasized in a hotly-debated recent Brookings Institution study, illicit economies (with drugs as the paradigmatic case, but also including trade in chemical and biological weapons components, human beings, conflict diamonds, and other illicit goods and services) provide a specific form of political capital to terrorist organizations. By "protecting the illicit economy," terrorists "protect the local population's livelihood from government efforts to suppress it" (Felbab-Brown, 2010: 17). Implications for public policy deriving from Felbab-Brown's political capital model of illicit economies include the controversial recommendation of less emphasis on eradicating drug crop cultivation per se and more on local government efforts to gain legitimacy with the local population (Felbab-Brown, 2010: 156–184).

What factors are associated with the participation of a relatively small number of terrorist groups in the drug trade, while insulating most others from this activity? How does drug activity relate to the wresting of territory from state control, ethnic grievances, and the pursuit of unconventional weapons (chemical, biological, radiological, or nuclear), among other activities and organizational attributes? We generalize a form of two-mode network analysis to address these and related questions in a study making use of open-source data on 395 terrorist groups in the period 1998–2005. In the process, we engage with the first two perspectives listed above on terrorism as a problem in political networks, and we also put forward a distinction relevant to Felbab-Brown's political capital model according to which, in our analysis, there are multiple logics moving terrorist groups toward drug activities, suggesting (again in our view) the possibility of different policy implications in different contexts.

Important studies of terrorist connections have been conducted on full network data ("who-to-whom" and "who-to-what") derived from open sources (e.g., Everton, 2012; Krebs, 2001; Pedahzur and Perliger, 2009; Roberts and Everton, 2011; Rodriguez, 2005). Nonetheless, in many situations information on the ties among terrorists is notoriously "incomplete, inaccurate or simply not available" (Tsvetovat and Carley, 2005; see also Hayden, 2009;

* Corresponding author. Tel.: +1 520 621 3524; fax: +1 520 621 9875.
E-mail address: breiger@arizona.edu (R.L. Breiger).

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Sparrow, 1991). One highly productive reaction has been to focus on computational modeling in order to understand behavior on the basis of simulated terrorist networks (e.g., Tsvetovat and Carley, 2005). In this paper we pursue a different strategy, making use of database information on actual groups and some of their known behaviors and attributes. As Perliger and Pedahzur (2011) point out, there has been "a striking increase in efforts and resources invested in data collection" on terrorist groups in recent years by academic and governmental agencies, such as the open-source, publicly available databases maintained at the START Center at the University of Maryland, resulting in the present availability of "high-resolution" information (see also Hayden, 2009). We believe that the community of social network analysts has important methods to offer that can be further developed to apply to analyses of data on terrorism of the sort that is contained in existing, public databases derived from open-source data.

1.1. Statement of objectives

This paper aims to make contributions that are both methodological and substantive. As to method, we begin by noting the importance to network analysis of two-mode (and, more generally, multi-mode) analysis of ties of affiliation connecting actors at different levels of structure (such as persons and groups). We move on to propose a substantial generalization, to make two-mode analysis relevant to the kinds of data table that typically underlie regression analyses and other methodologies that operate on cases-by-variables formats, such as Qualitative Comparative Analysis (e.g., Ragin, 2008), on which we focus here. Thus, techniques for the study of affiliations in two-mode networks can be generalized so as to be relevant to research problems that are often approached currently via configurational or regression modeling.

We demonstrate our methodological approach by showing that it offers new substantive insight. We explore correlates of participation in the drug trade on the part of terrorist groups. Our network-inspired two-mode thinking pushes us to look for multiple typologies (just as analysts have discovered multiple nexuses of persons and events in the "Southern Women" dataset of Davis, Gardner, and Gardner, for example [see Freeman, 2003, for extensive review and analysis]). Felbab-Brown (2010) puts forward in quite general terms her influential critique of eradication as a primary counter-narcotics policy. However, we emphasize that different cases manifest different sets of contingencies (see also DuPée, 2010 on multiple roles with regard to illicit drug activities, and George and Bennett, 2005, on case studies and theory development in the social sciences). Specifically, we find variety in types of involvement by groups engaged in drug activities, some groups exhibiting strong control of territory and tending to exploit directly the process of cultivation, while other groups do not control territory and are in many cases far removed from the drug growing fields. We consider the possibility that the eradication-centered policies that Felbab-Brown criticizes may in fact be effective when applied to the latter set of terrorist groups and their drug involvements. Thus, we provide a new methodological opening to discovering multiple types of admixtures of cases and variables that build on two-mode reasoning and that can aid in the study of policy alternatives. Our analysis does not include all possible variables required for a comprehensive study of drugs and terrorism, nor do we present a substantial theory of that subject. Instead, we show the potential of our approach to help researchers improve their ability to assess terrorist groups' degree of existing involvement in the drug trade.

2. Background

The two subsections focus in turn on introducing the generalization and expansion we propose of two-mode network analysis, and on providing brief and focused reference to the research literature that features case studies and substantive analyses at the intersection of illicit economies and violent non-state actors (VNSAs). From the existing research literature we identify behaviors and attributes that are of particular interest in linking terrorist organizations with participation in the drug trade.

2.1. Two-mode analysis of actors and attributes

The key concept of social network analysis that we further develop in this paper is duality, which has long been defined as the "turning inside-out" of a network at one level (say, pairs of groups as actors, connected by the people who belong to both groups in the pair) such that the vertices at one level become the edges at another (for example, pairs of persons as actors who are connected by the groups with which they jointly affiliate; Breiger, 1974). The concept of duality has been extended to multiple levels of affiliation (multimode analysis, with Fararo and Doreian, 1984, pioneering tripartite analysis; see also Carley, 2003, Cornwell et al., 2003, for major developments) and to sets of social networks at different levels (such as citations among French cancer researchers' publications, and mobility of researchers from one laboratory to another) connected by membership ties (affiliations of researchers with laboratories; Lazega et al., 2008), and the basic idea has been incorporated within the powerful ERGM family of statistical models for networks (Wang et al., 2009).

In this paper we develop an application of the duality concept that is relevant to database information on terrorist groups and their attributes and behaviors. Our approach to information in databases builds on Burt's (1983) fundamental insight that,

> "A connection exists between the usual concept of an actor's network position in social structure and combinations of attributes defining statuses in that social structure. Survey data on a randomly sampled respondent can be used to describe the relation pattern defining his 'ersatz' network position in the social structure from which he has been drawn."

By the term "ersatz" Burt means to imply that an actor's position (whether that actor is a man or woman or an organization) based on "combinations of attributes" can serve as a potentially useful artificial substitute for the actor's position in social structure. In this paper we have no need to think of an actor's location in an intersecting lattice of variables as a substitute for a social network among actors, because we consider the actor's position in a space of configurations of variables to be of interest in its own right. It may be difficult to obtain data on network ties among terrorist groups, but the relative similarities of terrorist groups to one another within a space of attributes, behaviors, and proclivities is an interesting generalized network to study in its own right, even though it exists on a different plane from direct connections of communication or resource flow among the same organizations. Similar insight has motivated network analysts to develop algebraic representations for beliefs and attitudes on the basis of survey data (Martin and Wiley, 2000), to study "symbolic networks" linking actors to political symbols (Ansell, 1997; Cunningham et al., 2010), to develop Bourdieu's concept of field theory with reference to correspondence analysis of data on group attributes and behaviors (de Nooy, 2003), to recast regression modeling as a problem in network analysis (Breiger et al., 2011; Melamed et al., 2013), and to analyze actor-by-event data matrices by using a form of Boolean analysis that is very similar to the QCA approach of Charles Ragin (Schweizer, 1996).