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EDITORIAL

Editor's Introduction: Quantitative Approaches to the Study of Terrorism

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Although criminological research on terrorism has expanded dramatically since the 1970s, it has generally not been noteworthy as an area that has generated cutting edge methodological and statistical innovations. In an encyclopedic review of research on terrorism, Schmid and Jongman (1988:177) identified more than 6,000 published works but point out that much of the research is "impressionistic, superficial (and offers) … far-reaching generalizations on the basis of episodic evidence." More recently, Silke (2001) concluded that only three percent of articles in journals that reported terrorism research used inferential statistical analysis compared to 86% of articles in forensic psychology and 60% in criminology. Victoroff (2005:34) similarly concluded that there were more psychological terrorism theories than empirical studies, and "even the small amount of psychological research is largely flawed, rarely having been based on scientific methods using normal and validated measures of psychological states, comparing direct examination of individuals with appropriate controls, and testing hypotheses with accepted statistical methods." Lum et al. (2006) reviewed more than 20,000 articles on terrorism published between 1971 and 2004 and found that only seven met their criteria of being moderately rigorous evaluation studies. But as the contributions to this special issue of the JQC illustrate, the situation with regard to quantitative approaches to the study of terrorism has begun to rapidly change.

Spurred on by expanded funding opportunities, especially from the Department of Homeland Security's (DHS) Science and Technology Directorate, the National Institute of Justice and the National Science Foundation, we are witnessing a huge growth in the depth and sophistication of the criminological research literature on terrorism. These developments have also been aided by the creation of DHS's Centers of Excellence program, and more recently, by the Department of Defense funded Minerva program. Research on terrorism arguably represents one of the major growth areas in social science scholarship

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over the past decade, and quantitative criminological research has figured prominently in these developments.

One of the most exciting aspects of this expansion has been the growing emergence of a whole new brand of global criminology. For years, quantitative criminologists interested in studying crime across countries were limited to cross-national data collected either by the United Nations (Groves et al. 1985), the World Health Organization (Messner and Rosenfeld 1997; LaFree 2005), INTERPOL (Bennett 1991; Howard et al. 2002) or various international victimization (Mayhew and Van Dijk 1997; Van Dijk et al. 2008) and self-reported crime surveys (Junger-Tas et al. 1994). While this work has done much to advance comparative criminology research, it also has serious limitations. The most important of these limitations is that cross-national comparative crime data have thus far been restricted mostly to a small number of highly industrialized western style democracies (Butchart and Engstrom 2002; Stamatel 2006). In a review of cross-national research on homicide, LaFree (1999) found that most prior research had been based on fewer than 40 of the world's countries. And of course these countries are not a random sample of the nations of the world but rather strongly over represent Europe and North America while almost entirely excluding Africa, the Middle East, and Asia.

By contrast, the new generation of terrorism research is drawn from countries from around the world. While three of the contributions to this special issue are from United States data, two are based on nearly all of the world's countries since 1970, one is based on data from Spain, another uses data from Iraq and a final article is based on data from Spain and El Salvador. Terrorism research may go a long way toward internationalizing quantitative criminology.

But if the articles in this collection are unusual for criminology in terms of their cross-national focus all eight of the articles can be seen as within the criminological mainstream in that they each build in one way or another on methods that either originated or have been widely applied in criminology. Thus, three of the articles (LaFree, Dugan, Xie and Singh; Braithwaite and Johnson; Behlendorf, LaFree and Legault) examine the geospatial distribution of terrorist "hot spots," two articles apply group-based trajectory analysis to terrorism data (Miller; Morris and Slocum); one article compares characteristics of terrorism to non-terrorist homicides using case control methods (Gruenewald and Pridemore); one uses multi-leveling modeling to examine sentencing decisions made in cases involving US terrorist suspects in federal courts (Johnson); and one investigates selectivity bias in the inclusion of terrorism-related homicides from the United States (Chermak, Freilich, Parkin and Lynch).

LaFree et al. examine the spatial and temporal patterns of terrorist attacks by the Spanish group ETA between 1970 and 2007. They investigate the impact of the ETA's 1978 announcement that it would shift from targeting the Basque territory to attacking more widely across Spain. The authors found that before 1978 the ETA mostly attacked within the Basque territories and that the diffusion of attacks between provinces mostly spread contiguously. On the other hand, after 1978 ETA attacks were mostly in areas outside of the Basque territories and they mostly diffused hierarchically to more distant locations. LaFree, Dugan, Xie and Singh also found that hierarchical diffusion was more common when a longer time elapsed between attacks and that attacks against Madrid were unlikely to be followed immediately by more attacks on Madrid or surrounding provinces. After ETA announced a shift in policy, they maintained a highly dispersed attack strategy even during their period of decline.

The Braithwaite and Johnson article examines the variables that have contributed to the emergence and disappearance of violent hot spots in Baghdad since the US led invasion

of 2003. The authors build on criminology research that demonstrates that the use of Improvised Explosive Devices (IEDs) in Iraq cluster in time and space in a manner similar to that observed for ordinary crimes. The researchers find substantial support for their hypothesis that less discriminatory counterinsurgency operations are followed by an increase in IED attacks whereas capacity reducing counterinsurgency operations are followed by declines in IED attacks.

Like Braithwaite and Johnson, Behlendorf et al. are concerned with identifying concentrations of violent attacks in time and space, referring to highly concentrated series of attacks as "microcycles." The authors draw on recent research demonstrating that individual crimes elevate the risk for subsequent crimes nearby, a phenomenon termed "near-repeats." Using data from the DHS and START supported Global Terrorism Database (GTD) the authors analyze over 4,000 terrorist attacks attributed to the FMLN in El Salvador and ETA in Spain; two terrorist organizations that were both extremely active but differed greatly in terms of history, grievances and motives. The researchers find strong support for the conclusion that many of the terrorist attacks attributed to these two distinctive groups were part of violent microcycles and that the spatio-temporal attack patterns by these two groups exhibit substantial similarities. They also find that compared to other tactics used by terrorists, bombings and attacks that result in fatalities are more likely to be part of microcycles and that compared to attacks that occur elsewhere, attacks aimed at national or provincial capitals or areas of specific strategic interest to the terrorist organization are more likely to be part of microcycles. The authors argue that the methods developed in the paper could be useful more generally for understanding the situational and temporal distribution of ordinary crime.

Miller points out that the quantitative analysis of terrorism frequently focuses on terrorist attacks as the unit of analysis, rarely examining terrorist organizations. Using the GTD, she examines the terrorist activity of 557 organizations that were active for at least 1 year between 1970 and 2008. Much like research on conventional crime, prior research on terrorism has focused almost exclusively on the onset of criminal behavior and has neglected determinants of declining activity. Miller hypothesizes that organizations that attack more rapidly and more frequently will last longer. Using dual group-based trajectory models she calculates the annual ratio of attacks to attacks-at-peak for each organization in order to isolate patterns of onset and decline, independent of the absolute magnitude of activity. Miller explores the extent to which the ways that terrorist organizations begin can be used to predict how they will end.

Recent criminological research has used latent class growth analysis (LCGA), a form of group-based trajectory analysis, to identify distinct terrorism trends and areas of high terrorism activity at the country level. Morris and Slocum assess the robustness of recent LCGA findings by comparing the results to those generated by general mixture modeling (GMM). Using the GTD, the authors consider the challenges and advantages of applying group-based analysis to macro-level terrorism data. They evaluate the results from LCGA and GMM models using both substantive and empirical criteria, highlighting the similarities and differences provided by both methods. They conclude that while both models have utility for terrorism research, LCGA models are better for the purposes of identifying hot spots of terrorist activity.

Gruenewald and Pridemore used data from the DHS and START supported open-source United States Extremist Crime Database (ECDB) and the UCR's Supplemental Homicide Reports (SHR) to investigate how domestic far-right terrorist homicides compare to common homicides. Their study illustrates how official homicide and open-source terrorism data on homicides can be synthesized and compared quantitatively to address

important theoretical and policy questions. The authors innovatively used multiple imputation by chained equations and logistic regression to impute missing values and estimate models to compare the two homicide types on 12 different victim, offender, and event characteristics. Gruenewald and Pridemore found that compared to other homicides, far-right terrorist homicides were significantly more likely to have white offenders, multiple victims, multiple offenders, and to occur between strangers, and they were significantly less likely to have white victims, to be carried out with a firearm, and to occur in cities with more than 100,000 residents.

While the preceding articles focus on etiological issues, Johnson used data from the DHS and START supported American Terrorism Study (ATS) to investigate early case processing outcomes for suspected terrorists in US federal district courts over a twenty-year period. He demonstrates the utility of a relatively little used but broadly applicable multilevel analytical approach—cross classified models. This technique is useful because the suspected terrorists he examines are simultaneously nested within terrorist organizations and criminal court environments and thus are characterized by overlapping data hierarchies that involve cross-nested ecological contexts. Johnson finds that legal factors (e.g., number of counts, number of co-defendants), extralegal factors (e.g., ethnicity of the offender) and incident characteristics (e.g., type of terrorism target) affect case processing outcomes. Case processing outcomes also vary significantly across both terrorist groups and criminal courts and are partially explained by select group and court characteristics including the type of terrorist organization and the terrorism trial rate of the court.

Finally, Chermak et al. point out that while it is important to use rigorous designs and advanced statistical techniques to study terrorism and move the field forward, it is equally important to investigate the quality of data used to produce these sophisticated models. The authors note that although the number of research studies that use open source data to examine terrorism has grown dramatically in the last 10 years, there has yet to be a study that examines issues related to selectivity bias. Their paper examines the reliability of the methods used to capture homicide incidents committed by far-right extremists in 10 sources used to create the ECDB. Using a "catchment-re-catchment" analysis Chermak et al. find that the inclusion of additional sources result in decreasing numbers of target events not identified in previous sources and an increasing number of events that were identified in any of the previous data sources. This finding indicates that collectively the sources are approaching capturing the universe of eligible events. Next, they assess the effects of procedural differences on these estimates and find variation in the number of events captured by sources. Importantly, though, the attributes of victim, suspect, and incident characteristics are generally similar across data sources. This finding supports the conclusion that scholars using open-source data are using data that is generally representative of the larger universe they are studying.

In sum, the eight articles in this issue demonstrate that criminology and terrorism research have a lot to offer each other. Post 9/11 and partially as a result of increased government funding the number of studies published on terrorism has increased dramatically. Silke (2008) finds that in the last decade over 1,000 books were published each year. In addition, scholars from fields such as criminology that had largely ignored terrorism issues began to turn their attention to it. This special issue seeks to further advance the quality of terrorism research by applying theories, insights and methods drawn largely from criminological perspectives. Methodologically, the increased application of cutting edge statistical techniques commonly used in criminology, like those used in this issue, will improve the quality of terrorism research. The increased use of rigorous quantitative and qualitative techniques will help terrorism research become more like other social

science disciplines that employ systematic methods. And conceptually, the application of criminological frameworks will offer fresh perspectives on terrorism issues that will help us better understand this important phenomenon.

The recent developments of large-scale international databases such as the GTD demonstrate that terrorism is a world-wide problem. Scholars have begun to make great use of these databases and have examined terrorism globally and in regions around the world. Thus, an increase in the number of criminologists using these global databases could reinvigorate international and comparative criminology. It offers the opportunity for the field to expand its horizons outside a handful of westernized democracies to regions that suffer from the same maladies but that because of lack of data have been largely ignored by criminologists.

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