ABSTRACT

WHEN PEOPLE REBEL: A COMPUTATIONAL APPROACH TO VIOLENT COLLECTIVE ACTION

Bianica Pires, PhD

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Dissertation Director: Dr. Andrew Crooks

Why an individual rebels, why an individual joins collective action, and how that manifests to violence are not new questions, but are questions that continue to pose a significant scientific challenge. It is the role of the conflict analyst to answer these questions by exploring the underlying dynamics, interactions, and individual behaviors of the conflict. Violent collective action, a subfield of conflict studies, is a complex system, consisting of individuals with unique attributes that interact with other individuals through interconnected networks on a heterogeneous environment. In order to represent a complex system, we must model it from the "bottom-up," as the only way to generate the macro-behaviors is by modeling the individual, micro-level components of the system. In its ability to model complex systems, a computational approach is ideal. While various computational models have explored the use of agent-based modeling (ABM), social network analysis (SNA), and geographic information systems (GIS) in the field of violent

collective action, most have explored the techniques in isolation. The models presented in this dissertation build on the value of integrating these approaches. Computational methods (i.e., ABM, SNA, and GIS) are used to develop three instantiations of more general models of violent collective action. The instantiations, or case studies, were selected for their diversity in terms of geographic location, temporal and spatial scale, and the political and cultural issues underlying the violent collective action. In addition, the case studies serve as building blocks; as I add layers to the environment, develop more sophisticated cognitive frameworks, and create agent-to-agent and agent-to-environment interactions that more closely represent reality. In addition, with the final case study I will demonstrate the value of integrating the three computational methods. Using empirical data for which to create the modeling world and inform the agents, qualitative agreement with actual events modeled are sought. The research question this dissertation addresses is: Can a bottom-up approach provide us with useful insight into the formation, spread, and strength of violent collective action? By covering a variety of different situations of violent collective action while building on the complexity of each computational technique used, the use of a computational approach to gain a better understanding violent collective action is given greater legitimacy. Through such understanding, this dissertation contributes to the existing body of knowledge on the topic of violent collective action.