

CIVIL RESISTANCE AND THE PROCESSES OF CONTENTIOUS POLITICS IN  
EGYPT, 2010-2015

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Abstract

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Egyptian pro-democracy activists mobilized two major uprisings in recent years: one ending Hosni Mubarak's decades-long rule in February 2011, and the other precipitating a coup against newly-elected president Mohamed Morsi in July 2013. Prior research indicates that nonviolent campaigns succeed more often and are more likely to result in democracy than armed insurgencies. The theory, in essence, is that nonviolent campaigns better facilitate popular participation, which simultaneously serves to mobilize more potent campaigns and encourage democratic governance. But that explanation is inadequate when civil resistance has mixed outcomes, as in the case of Egypt. Therefore, this dissertation shifts the analytical perspective to the processes of contentious political transitions in which civil resistance campaigns are embedded. It focuses on the years 2010 through 2015 in Egypt, using the two major uprisings as a paired comparison to develop the theorized linkage between civil resistance and democratization. It finds that civil resistance in Egypt operated through multiple mechanisms that interacted dynamically over time and were sensitive to changes in the wider structure of political relations.

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## INTRODUCTION

### I.1 Subject and Significance

This dissertation examines the dynamics of civil resistance within Egypt's contentious political transition between 2010 and 2015. The central theme is the theorized positive association between civilian-based uprisings and democratization, because the case of Egypt—with its ambiguous civil resistance outcomes of regime change in 2011, followed by the country's first free elections in 2012, and then a military coup in 2013—challenges prominent explanations of the efficacy of nonviolent campaigns. Whereas civil resistance scholars have tended to theorize factors of success or failure for immediate objectives (such as ousting a ruler) and long-term goals (such as democratic consolidation) in a single explanatory framework (e.g., Ackerman and Kruegler 1994; Chenoweth and Stephan 2011; Sharp 1973), this work finds that civil resistance in Egypt operated through multiple mechanisms that dynamically interacted over time and were sensitive to changes in the wider structure of political relations.

#### I.1.1 Research Questions and Key Findings

The main body of the dissertation is organized into three chapters, each addressing different aspects of the conditions under which civil resistance did and did not advance democratization in Egypt. Chapter 1 lays out the historical narrative of the case, launching the paired comparison of the major civil resistance campaigns of January 25 – February 11, 2011 and June 30 – July 3, 2013, and establishing the inadequacy of general

explanations of civil resistance outcomes for cases of mixed results. It is guided by the opening question: *can the complexities of the Egyptian case be reconciled with general theories of nonviolent action?* It argues that civil resistance works, both for short-term and long-term outcomes, when it prefigures democracy, and that prefiguration is manifested in five analytically distinct mechanisms: (1) fostering inclusive political participation; (2) organizing civil society; (3) establishing civilian checks on authority; (4) implementing procedures for nonviolent conflict management; and (5) instituting practices of egalitarian self-governance. It traces the varying efficacy of civil resistance in Egypt between 2010 and 2015, demonstrating that the deviation from the ideal-typical path following the potent campaigns of 2011 and 2013 can be understood as a consequence of shifts in the operation of and configuration among the five mechanisms over the course of a multi-year process of contentious politics. This analysis serves to refine the theorized link between nonviolent action and democratization and establish a foundation for the empirical investigations of Chapters 2 and 3.

Chapter 2 shifts into a different mode of analysis to scrutinize the dynamics within Egypt's contentious political transition in ways the historical narrative could not. Using comprehensive conflict event data for Egypt, it examines networks of contentious relations surrounding the civil resistance campaigns of 2011 and 2013, asking *what patterns in the changing structure of contentious relations help explain the different gradations of success for the two major civil resistance campaigns in Egypt?* It finds that the 2011 campaign, which was followed by advances to democratization unprecedented in Egypt, occurred within a relatively simple network structure, with the government as the central target of predominantly nonviolent action. By contrast, the 2013 campaign,



which was followed by a military coup and a return to autocracy in the country, occurred within a much larger and more complex network, with many clusters of conflict and a high proportion of violent action. These findings give one insight into how the prefigurative mechanisms shifted out of ideal-typical mutual reinforcement, while also prompting deeper investigation of the dynamics of alignment within the Egyptian field of contention.

Chapter 3 takes this next step by analyzing joint action relations implicit within the networks of contention. Using the same conflict event data, one can construct joint action relations among actors that simultaneously targeted the same entities and concatenate them into networks. The analysis complements that of Chapter 2, answering the question, *what patterns in the joint action relations help explain the differences in civil resistance efficacy between the two major civil resistance campaigns in Egypt?* It shows that the joint action networks were significantly complex throughout the period 2010-2014, but with contrasts in the levels of complexity and the substantive features immediately surrounding the 2011 and 2013 campaigns. In particular, the networks became much more complex after the 2011 campaign, with greater disassortativity by identity category, larger proportions of underlying violent actions, and higher relational instability during the 2013 campaign. These findings add intricate details to the relational context of civil resistance, which combine with the lessons learned about contentious relations networks to provide a crisp, high-resolution picture of the relational structures within which civil resistance did and did not result in strides toward democracy. Moreover, they round out the support for the concluding argument that civil resistance

operates differently depending on both the alignment of prefigurative mechanisms and the structure of relational contexts.

### I.1.2 Contributions to the Literature

The substantive findings of the project contribute to ongoing theory-building about the role of nonviolent movements in contentious politics with thorough analyses of micro-processes that are either obscured in large-N cross-sectional analyses or left unexplored in comparative case studies. While many of the empirical results are ideographic from a theoretical standpoint, this project differs from many other case studies in its theory-driven formal methodology. The conclusions are intentionally framed for analytical generalizability in future empirical applications. To be more concrete, the historical analysis of Chapter 1 operates within the theoretical framework of contentious politics and the methodological framework of process-tracing, recasting well-known features of civil resistance as distinct mechanisms of contentious political transition that are not only evident and explanatory in Egypt, but that are general enough to be traced and tested in any other case of civil resistance. The network analyses of Chapters 2 and 3 unfold within an expanded theoretical framework of relational sociology, fusing foundational insights about social conflict with advanced methods from network science to not only expose changes in the structure of the Egyptian contentious action field directly, but also to elucidate formal patterns that are already known to apply to a wide variety of networks—though never previously applied to contentious politics. Conflict event data are available for other cases and can be transformed and analyzed as networks following the precedents the dissertation sets.

The lasting scholarly significance of this project is, in short, threefold: (1) it provides a unique exposition of a prominent and challenging case of civil resistance; (2) it refines the scholarly understanding of civil resistance to better account for the complex relational dynamics surrounding specific campaigns and to trace the mechanisms by which civil resistance operates more precisely; and (3) it introduces rigorous methods for analyzing contentious politics, and social conflict more broadly, with formal concepts and computational techniques from network science.

## I.2 Methodology

This project mixes methods to complete a thorough study of the conditions, dynamics, and outcomes of civil resistance in the case of Egypt, concentrating on the years 2010 to 2015. It rests primarily on the inductive side of the research cycle, bringing a new perspective to the scholarship on civil resistance and building up the theoretical explanations of how civil resistance works, which is intended to propel future empirical testing and conceptual refinement with comparative cases. Each chapter includes details on the data sources and methods it employs, including theoretical justifications for the different approaches and discussions of the complementarities between them. But before diving into the chapters, it is useful to establish at the outset an overarching frame of reference for the project.

### I.2.1 Impetus and Case Selection

The interdisciplinary subfield of research on nonviolent action and civil resistance has developed through surveys of many historical examples (e.g., Sharp 1973), comparative-historical analyses of exemplary cases (e.g., Ackerman and Kreugler 1994;

Nepstad 2011a; Schock 2005), and cross-sectional statistical analyses (e.g., Chenoweth and Stephan 2011; Karatnycky and Ackerman 2005). Because so much of the research has focused on the factors for success, there is at present a strong need for closer examination of the differential outcomes of civil resistance campaigns (see Schock 2013, 2015). In particular, the literature lacks deep analyses of how civil resistance has and has not contributed to democratization in the long-term.<sup>1</sup> This is no small task; it requires not only new empirical research, but also expansion beyond the familiar methodologies. This dissertation, therefore, is meant to spur the subfield in that direction with a fresh approach to a particularly salient case.

Egypt is an extraordinarily valuable case to study because so much happened in a span of a few years. The analyses throughout the three chapters are framed as within-case comparisons between the civil resistance campaigns of January 25, 2011 and June 30, 2013. Paired comparisons are especially useful for research on contentious politics because they allow the researcher to focus on theoretically germane contrasts in historical processes and the causal mechanisms therein (McAdam, et al. 2001, 2008). With Egypt, the central contrast is the contributions each campaign made to democratization: the first led to the country's first free presidential election, among other advances; the second ended the tenure of the first democratically elected president and precipitated a return to autocracy. Thus, the case entails just the kind of variation in outcomes needed to advance the scholarly understanding of the link between civil resistance and democratization.

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<sup>1</sup> A noteworthy exception is Bartowski's (2013) volume on liberation struggles.

### I.2.2 From Historical Narrative to Time Series Data

This project employs two general methodologies, each selected for its utility in studying social processes: historical-comparative analysis and time series analysis (see George and Bennett 2005; Mahoney 2012; McAdam, et al. 2008). Chapter 1 traces the sequence of events leading up to the January 25, 2011 campaign through the aftermath of the June 30, 2013 campaign. These two campaigns anchor all other events in an analysis focused on explaining the mixed results of civil resistance in terms of mechanisms embedded within a process of contentious political transition. The historical record, therefore, is deliberately selective, yet still comprehensive enough to serve as a foundation for the more abstract analyses of Chapters 2 and 3.

While Chapter 1 could stand on its own as a study of the Egyptian case, it raises questions about the intricate dynamics of political relations surrounding the two major civil resistance campaigns—questions that can be answered vaguely with the information provided in the narrative, but that need clarification if they are going to carry their full theoretical weight. Consequently, the project shifts to time series methods in Chapters 2 and 3, whereby one is able to quantify discrete acts of contention and scrutinize many different trends and fluctuations within the processes of contentious politics they represent. Here again, the analyses are structured to highlight similarities and differences between the contexts surrounding the 2011 and 2013 campaigns. Each campaign is coded as a single event, out of hundreds of contemporaneous events, so the analyses of the time series data are much more about the relational context of civil resistance than historical narrative of Chapter 1 was.

And the emphasis in Chapters 2 and 3 is on the relations evident in event records: the contentious relations between actors and targets, and the joint action relations between actors with simultaneous mutual targets. The relational focus of these analyses sets them apart from most studies using time series data in the social movements and contentious politics literature. The unfamiliarity of the relational approach to conflict event data presents challenges of interpretation, but it has the overwhelming advantage of opening these data to the powerful tools of formal network analysis. Although unprecedented, the transformation of conflict event records to dynamic network data is quite intuitive. More importantly, it reveals myriad insights into the processes of contentious politics—all of which can be measured precisely, and many of which can be modeled statistically.

### I.2.3 Presentation of Findings

There is much more to see in the data from the Egyptian case than this dissertation can show, and of what is shown, there is more than can be integrated cogently into the central theme. As mentioned above, the case history is necessarily selective, and yet it includes details that may appear tangential to the argument about prefigurative mechanisms. Every minute fact presented in Chapter 1 has been deemed necessary to do justice to the case; thus, if no additional reason for a given detail is stated in the text, that is its purpose. The matter of excess findings is amplified with the dynamic network analyses in Chapters 2 and 3. Perhaps the ease of decoding will improve as the application of these methods to contentious event data develops, but as it stands, one must tolerate a fair volume of noise in order to ensure that the signal is not lost or corrupted. Moreover, the novelty of the contentious relations and joint action

relations networks warrants erring on the side of exhaustion to substantiate the claims made about them. To that end, the dense and numerous data visualizations included in the main body of the dissertation are further supplemented in the Appendix.

# CHAPTER 1:

## CIVIL RESISTANCE MECHANISMS, DEMOCRATIC PREFIGURATION, AND DISRUPTED DEMOCRATIZATION<sup>2</sup>

### 1.1 Introduction

The Egyptian uprising against Hosni Mubarak in 2011 was a striking illustration of people power, but the subsequent rise of the Muslim Brotherhood and the military coup against it in 2013 highlight the need to scrutinize the purported link between civil resistance and democratization.<sup>3</sup> Recent studies have made the case that civil resistance campaigns against autocratic regimes fare significantly better than violent insurgencies with similar goals—with cross-sectional data showing that unarmed, civilian-based approaches are not only more likely to achieve short-term objectives, but also more strongly tied to strides toward democracy in the long run (Chenoweth and Orion 2013; Chenoweth and Stephan 2011). While experts of political transitions have often warned

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<sup>2</sup> A modified version of this chapter appears as the published article, Matthew J. Chandler, “Civil Resistance Mechanisms and Disrupted Democratization: The Ambiguous Outcomes of Unarmed Insurrections in Egypt, 2011-2015,” *Peace and Change* 43, no. 1 (January 2018): 90-116. The author retained the right to re-use the published article as a minority portion of this dissertation. This chapter differs from the published article by extending several sentences and paragraphs in the main body, as well as adding a number of footnotes and references to source materials.

<sup>3</sup> Various terms have been used to describe the phenomenon of unarmed, civilian-based movements for political change. This chapter leads with the term “civil resistance” because it is the most common in the multi-disciplinary literature on the subject in recent years (Nepstad 2013b, 2015; Schock 2013, 2015). The next section clarifies related terminology.



that forcing out an autocrat can lead to a variety of regime outcomes along the autocracy-democracy spectrum (Linz 1978; Linz and Stepan 1996; O'Donnell and Schmitter 2013), the dedicated research on nonviolent action overwhelmingly emphasizes positive effects. Those who have studied negative results focused on factors that stymied mobilization or otherwise prevented a nonviolent campaign from occasioning regime change (Chenoweth and Stephan 2011; Nepstad 2011a; Schock 2005). The civil resistance literature to-date lacks research on cases with mixed results, particularly those in which civil resistance campaigns were involved in state-level political transitions but did not ultimately propel democratization.

Thus, the scholarship on nonviolent action leaves a puzzle for the case of Egypt. There were two major anti-regime campaigns between 2010 and 2015. The first was against longstanding President Hosni Mubarak, marked by the inception date of January 25, 2011, and the second was against newly-elected President Mohammed Morsi, marked by the inception date of June 30, 2013.<sup>4</sup> Both campaigns may fairly serve as examples of effective civil resistance—at least in the short-term, as they mobilized millions of unarmed civilians and initiated the presidential departures they explicitly sought. In light of the general trends of civil resistance, one therefore has grounds to predict that the campaigns would also result in advances toward democracy. The democratic process begun after Mubarak's departure was controversial, but it did produce the country's first genuine presidential election in May and June 2012. However, in a matter of months,

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<sup>4</sup> These are the dates Egyptians commonly use to refer to the two campaigns, even though the watershed events of presidential departure occurred later in each case (February 11, 2011 and July 3, 2013, respectively).

President Morsi began pushing out competing parties and instituting divisive policies. As a result, within a year of taking office, Morsi became the target of the second major campaign. Competing pro- and anti-Morsi demonstrations brought the nation to a crisis, and the Egyptian military intervened by arresting Morsi on July 3, 2013. By mid-August 2013, the military was in firm control of the country and forcefully repressing all of Morsi's supporters. The former Defense Minister Abdel Fattah el-Sisi then became President in June 2014 and proceeded to consolidate power for a military-backed regime through 2015. When one considers the full chain of events from the origins of January 25 campaign through the outcomes of the June 30 campaign, the civil resistance literature leaves one grasping for an explanation.<sup>5</sup> From a theoretical standpoint, how should the efficacy of civil resistance be evaluated in this case? Can its complexities be reconciled with general theories of nonviolent action?

This chapter argues that the deviation from the ideal-typical path following potent civil resistance campaigns in Egypt can be understood as a consequence of many shifts in the operation of and configuration among civil resistance mechanisms over the course of a multi-year process of contentious politics. In this sense, one can tease apart specific ways civil resistance did and did not contribute to democratic social change, rather than

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<sup>5</sup> To be clear, none of the comparative studies of civil resistance referenced above suggest that immediate success against an autocrat guarantees later democratization. The authors of these studies are all quite careful to generalize their findings in terms of trends and likelihoods (Ackerman and Kruegler 1994; Celestino and Gleditsch 2013; Chenoweth and Orion 2013; Chenoweth and Stephan 2011; Karatnycky and Ackerman 2005; Nepstad 2011a; Schock 2005). The problem is that cases that deviate from the general patterns are not fully theorized. Because the main comparisons are success and failure in violent and nonviolent campaigns, unsuccessful nonviolent campaigns are either categorized as anomalous or as lacking the explanatory factors for positive outcomes. While it would be imprudent to revise the general patterns based on one case only, it is worthwhile to seek an explanation for counter-trend cases—especially with reference to the theorized mechanisms of the trends (George and Bennett 2005; Goertz and Mahoney 2012; Ragin 2008).

imposing a summary evaluation, and therefore use the rough texture of the case to polish the scholarly understanding of the efficacy of nonviolent action.

The next three sections of this chapter clarify terminology and synthesize prominent themes across related literatures to establish a general account of how civil resistance functions to advance democratization by prefiguring its ends within its means. The bulk of the theorizing takes place in section 1.4, where five distinct mechanisms of civil resistance are elaborated: (1) fostering inclusive and proactive political participation; (2) organizing civil society; (3) establishing civilian checks on state authority; (4) implementing procedures for nonviolent conflict management; and (5) instituting practices of egalitarian self-governance. Each mechanism prefigures certain aspects of democracy, so in the ideal-typical manifestation they operate simultaneously and reinforce one another to propel social change. Drawing on a variety of primary and secondary sources, the fifth section shows how these mechanisms operated in Egypt and explains the mixed results of civil resistance in terms of the alignment and malalignment of the mechanisms. This chapter concludes in section 1.6 with a discussion of summary lessons regarding the linkage between civil resistance and democratization, and by motivating the analyses of relational dynamics in Chapters 2 and 3.

## 1.2 Civil Resistance as Contentious Politics

Although there is a history of isolated research on nonviolent action, it is helpful to couch the phenomenon of civil resistance within an analytical framework of contentious politics (McAdam and Tarrow 2000; Nepstad 2015, 2013b; Schock 2003, 2013, 2015)—a position maintained and justified throughout this dissertation. Civil resistance entails a kind of contentious political interaction that is similar in many

respects to that of social movements, insurgencies, and revolutions. All of these involve the mobilization of non-governmental actors, often in large numbers, as well as sustained extra-institutional challenges to the political order. In addition to context-specific features of their fields of contention, cases of contentious action differ by their targets and strategies, tactical repertoires, and relational dynamics (McAdam, et al. 2001; Tarrow 2011; Tilly 2006, 2008). Civil resistance is distinct from other forms of contentious politics for “the sustained use of methods of nonviolent action by civilians engaged in asymmetric conflicts with opponents not averse to using violence to defend their interests” (Schock 2013:277). A civil resistance campaign need not be purely nonviolent to qualify as such, but nonviolent methods must predominate among the challengers, with concerted effort made by organizers to exclude armed actors, avoid the use or threat of violent tactics, and advocate nonviolent means to manage political conflicts (Chenoweth and Stephan 2011; Nepstad 2011a; Schock 2003, 2005; Sharp 1973; Vinthagen 2015; Zunes 1994).

The dedicated research on civil resistance has tended to focus on challenges to autocracy at the state level—as these are the clearest examples of the phenomenon—but the concept allows for variation in aims (Ackerman and Kruegler 1994; Nepstad 2015; Schock 2013; Sharp 1973, 2005). While many civil resistance campaigns explicitly seek to establish formal democratic governance at the state level, the defining objectives of civil resistance relate more so to the foundational principles of self-determination, political enfranchisement, government accountability, personal freedom, and social justice (Ackerman and Kruegler 1994; Sharp 1973). Depending on the case and context, the objectives of a nonviolent campaign may range from policy reform to regime change,

from minority rights to self-liberation, or from accountability instruments to the expulsion of occupation forces. This analysis of civil resistance campaigns in Egypt follows Chenoweth and Stephan (2011) in focusing on civil resistance campaigns with maximalist national-level aims, which includes ousting dictators and military juntas, pushing out foreign occupations, self-liberation (including separatism), and other fundamental political overhauls, such as ending apartheid. It focuses in particular on civil resistance campaigns intended to remove the head-of-state and initiate democratic reform.

### 1.3 How Civil Resistance Works

Social scientific theories about how civil resistance works are largely built around Sharp's (1973) study of the strategy of nonviolent action. He argued that political power always depends upon the consent of citizens, even in non-democracies (Sharp 1973, 1980). Sharp thus emphasized the agency of activists, cataloguing all the ways civilians have organized and resisted oppression using nonviolent means. He identified 198 distinct methods, grouped into three categories: nonviolent protest and persuasion; noncooperation; and nonviolent intervention. Sharp (2005) described these methods as working through four mechanisms of political change: *conversion*, *accommodation*, *coercion*, and *disintegration*.<sup>6</sup> The former two involve a willingness to reform on part of the regime and are ultimately accomplished through negotiation. The latter two are

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<sup>6</sup> Note that the first three appeared in Sharp's earlier work (1973), while the fourth was added later (2005). For an even earlier explanation of the first three mechanisms, see Lakey (1968).

pushed through by nonviolent campaigners against the will of the rulers and are ultimately accomplished through regime change.

This study does not adopt Sharp's four mechanisms because they do not so much explain differential outcomes of civil resistance as they typologize its forms of success in anti-regime struggles. For the present purposes, an explanatory mechanism needs to link causes with effects within a larger process of political change (Falleti and Lynch 2009; McAdam, et al. 2008; Tilly 2001). All four of Sharp's mechanisms pertain to a regime's immediate response to a nonviolent campaign, and not to the resulting political order. Since this analysis is concerned with how civil resistance contributes to democratization as well as regime change, other scholars are needed for guidance.

Several influential voices in the conversation about nonviolent action have followed Sharp to argue that good strategy on part of campaign organizers is the key to success (Ackerman and DuVall 2000; Ackerman and Kruegler 1994; Chenoweth and Stephan 2011; Popovic, et al. 2007). Cross-sectional statistical analyses further indicate that remaining nonviolent is a strategic advantage, as nonviolent campaigns have a higher rate of success than violent campaigns over the last century (Chenoweth and Lewis 2013; Chenoweth and Stephan 2011; Karatnycky and Ackerman 2005), and unarmed regime-changing campaigns are more likely to result in durable democratic reform than violent revolutions (Celestino and Gleditsch 2013; Chenoweth and Stephan 2011; Johnstad 2010; Kadivar and Caren 2016; Karatnycky and Ackerman 2005). In the most prominent work in this vein, *Why Civil Resistance Works*, Chenoweth and Stephan (2011) condense the explanation of these findings into the "primacy of participation." All else being equal, nonviolent campaigns have lower barriers for inclusion, which allows them to gain power

in numbers relatively quickly. Unlike violent insurgencies, nonviolent campaigns mainly take place in public, rarely require long-term commitments, and involve comparatively low personal risks. It is thus easier for organizers to convince people to join a nonviolent campaign. Moreover, when faced with violent repression, disciplined nonviolent campaigners are able to win the moral high ground and gain more sympathy from bystanders. Chenoweth and Stephan offer the same features of inclusion and bystander support as important factors in the link between civil resistance and democratization, but they leave further details about how for future research projects (2011:219).<sup>7</sup>

Other recent studies reached analogous conclusions about the efficacy of nonviolent action, but without such an overwhelming emphasis on the agency of nonviolent campaigners. Nepstad (2011a) explained how the success of nonviolent anti-regime campaigns is greater after economic downturns, especially when fractures in the state's leadership emerge. These factors shape civil resistance campaigners' skillful decisions, especially as they capitalize on moral shocks and seize opportunities to win support from defecting armed forces. Schock (2005) made similar arguments in his comparative analysis of unarmed insurrections. Influenced by the political process model (McAdam 1999), he stressed that successful campaigns require political opportunities outside the control of activists, as well as a widespread oppositional consciousness (see Morris 1984).<sup>8</sup> Given these necessary conditions, strategy is still germane, especially the

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<sup>7</sup> Celestino and Gleditsch (2013) subsequently took up the question, and in their cross-sectional analysis, they found further support for the claim that large-scale nonviolent direct action predicts democratization (net of other known predictors). Although not tested directly, they echo Sharp in arguing that nonviolent movements effectively distribute political power and open more possibilities for regimes to compromise.

<sup>8</sup> For Schock (2005: 26-27), it is important that the political process model (McAdam 1999) expands beyond an emphasis on resource mobilization (McCarthy and Zald 1977). Civil resistance scholars

need to coordinate diverse tactics waged on multiple fronts of resistance (Schock 2005). Ritter (2014) took a yet more expanded view of the conditions for successful civil resistance, demonstrating how international context affects outcomes. Unarmed revolutions succeed when the regimes they target are constrained by liberal norms and practices through strategic alliances with powerful democratic nations (Ritter 2014).<sup>9</sup>

#### 1.4 Civil Resistance and Democratic Prefiguration

Considering the different approaches to explaining civil resistance outcomes together, there is an opportunity to proceed by synthesis. As has been done with research on social movements and revolutions under the umbrella of contentious politics (McAdam, et al. 2001), conclusions about civil resistance from many points along the agency–structure continuum can be integrated coherently by shifting the analytical orientation to the process of change (rather than factors predicting major events). In this vein, one can encapsulate explanations of the importance of civil resistance in democratic transitions offered by multiple scholars in a unifying concept: *prefiguration*.<sup>10</sup> That is, when nonviolent methods bring about regime change and democratization, they do so

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tend to overlook both of these prominent orientations to social movement research, but the gaps seem to be closing in recent years (Nepstad 2015, 2013b; Schock 2013).

<sup>9</sup> Beck (2014) also drew attention to the international context surrounding popular uprisings, finding a connection between a country's linkages to liberal world cultural norms and regime change by way of popular uprising. Likewise, Celestino and Gleditsch (2013) highlight the positive effect of democracy in bordering countries on the likelihood that civil resistance will result in democratization.

<sup>10</sup> For social movement scholars, the notion of prefigurative democracy is often introduced with reference to movement actors' deliberate intentions to model democratic governance in their own actions (e.g. Blee 2012; Epstein 1991; Polletta 2002, 2006). The present conceptualization of prefiguration is more analytical, such that concerted envisioning on part of collective actors is neither required nor excluded. What makes an action prefigurative is that it produces immediate patterns of social relations that correspond to temporally distant patterns of a broader process in which the action is embedded.



through mechanisms that effectively prefigure democratic governance before it becomes a political reality. The concept of prefiguration points to the essence of Sharp's (1973) theory of nonviolent action, and it can be mapped onto any of the major findings from subsequent studies of civil resistance. To flesh out the concept, this chapter identifies five distinct mechanisms by which civil resistance prefigures democracy—each of which is also grafted into roots of democratization theory.

First, *civil resistance fosters inclusive and proactive political participation*. This mechanism points to the basic social foundations of democracy from the Tocquevillian tradition (Tocqueville 1843). Below any particular election procedure or constitutional division of authority is the engagement of ordinary people in political decision making. Understanding that every political body has a social history before formal democratization begins, the involvement of the citizenry in politics necessarily entails inclusion across identity boundaries, labor divisions, and status positions (Cohen and Arato 1992; Habermas 1989). Even after democratic institutions are established, the quality of democracy still fundamentally depends on the inclusive participation of citizens from diverse backgrounds (Fishman 2016; Fung and Wright 2003; Pateman 1970; Young 2000). Therefore, civil resistance prefigures democracy through participation not just by recruiting a sizeable portion of the population, but also by representing the diversity of the population—especially across social strata and sectarian divides (Foran 2005; Goldstone 1991, 2011; Moore 1966; Skocpol 1979; Wickham-Crowley 1992). The thrust of recent civil resistance research has been to compare nonviolent campaigns to violent campaigns on the matter of inclusion. While the claim that unarmed resistance has lower barriers to participation than armed resistance has fair

support (Chenoweth and Stephan 2011), the point about power in numbers applies more to overcoming an autocratic ruler than it does to building democracy. What matters most for democratic prefiguration is the extent to which civil resistance brings together otherwise disengaged persons from otherwise dislocated segments of society to perform politics together in an orchestral fashion.

Second, *civil resistance improves the organization of civil society*. Contrary to what a superficial reading of Sharp (1973) may lead one to infer, nonviolent campaigns do not spontaneously crop up from the grassroots. Civil resistance progresses when it contributes a new level of coordination among pre-existing civil society associations (Moyer 2001; Nepstad 2011a; Popovic, et al. 2007; Schock 2005). It is not about inventing the wheel, but rather about finding available wheels and putting them together to make a vehicle. This has been a central point in the social movements literature for decades (e.g., Clemens 1997; McAdam 1999; McCarthy and Zald 1977; Morris 1984; Oberschall 1973; Tilly 1978). With reference to democratic prefiguration, it intersects with Putnam's (1993) argument that a thriving democracy depends on a high degree of social capital in society (see Edwards, et al. 2001; Fung 2003). Putnam relied on a broad conceptualization of social capital as "trust, norms, and networks" within and among civic associations (1993:167). In an effort to specify how social capital undergirds democracy, Fishman (2004) narrowed the focus to two basic types of social ties: those that foster conversation across social classes and those that broker access to power. Nations with a prevalence of these social ties experience a deeper democracy. More to the point, Fishman (2011) also found that revolutionary transitions can aid democratic consolidation by inverting and flattening social hierarchies (see Fernandes 2014; Slater

2009). Baldassarri and Diani (2007) further elucidated how organization across civil society fosters democracy using network formalizations: a polycentric structure of relations across a political field provides actors (both individuals and groups) with embedded support in dense local clusters and capacity to mobilize for shared objectives through bridging ties between clusters (see Dixon and Roscigno 2003; Fung 2003; Minkoff 1997; Mische 2007; Osa 2001). If social movements generally contribute to this kind of reorganization of social relations (Diani 1997), then civil resistance campaigns succeed when they do so intensely and extensively. Moreover, the democratic prefiguration of this mechanism comes not only of growing and linking up civil society organizations, but of shifting the underlying social order and undermining the capacity of the central government to coerce the population.

Third, *civil resistance implements civilian checks on state authority*. While political violence is never completely eliminated in democracies (Davenport 2007; Earl 2003, 2011; Soule and Davenport 2009), the right of citizens to hold the government accountable is one of the classical pillars of democracy. Exposing the injustices of state policies and practices is also a hallmark of nonviolent action (Gandhi 2001). Civil resistance campaigns mobilize ordinary civilians for dramatic acts of protest, noncooperation, and intervention that highlight the distance between popularly acceptable standards of governance and the status quo. While civil resistance actions work best when they have clear targets, they also need to be performed before wide domestic and international audiences—as an appeal to popular standards ultimately depends on public sentiments (Schock 2005). Repression of nonviolent action often backfires, as additional state injustices are exposed and nonviolent activists win more sympathy and support from

bystanders, some of whom join the campaign, and others of whom add external pressure to the regime (Martin 2007, 2015).<sup>11</sup> This dynamic has a specific term in the nonviolent action literature: *political jiu-jitsu* (Sharp 1973; Martin 2015). If manipulated correctly, the ruling authority's strength of coercive force can be turned into a weakness. With sustained civil resistance and outside pressure from human-rights-conscious actors, state leaders become increasingly compelled to refrain from the use of force against unarmed campaigners, while citizens gain a sense of empowerment (Ritter 2014). In broader context, one of the principal roles of modern social movements is to put pressure on national governments to respect the will of the people (della Porta 2014; Fung 2003). Successful civil resistance campaigns not only out-manuever the tactical forces their opponents deploy, but they also amplify the general function of social movements for governmental accountability.

Fourth, *civil resistance establishes procedures for nonviolent conflict management*. It is understood from both the theorization (e.g., Dahl 1971; Diamond 2008; Elster 1998; Lipset 1963) and the empirical analysis (e.g., Coppedge, et al. 2008; Gerring, et al. 2005; Linz and Stepan 1996) of democratic consolidation that it depends on fair procedures for managing disagreement between political stakeholders (see Fishman 2016; Thompson 2008). A democracy, especially a young one, will not thrive if

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<sup>11</sup> An important intervening factor here is the media (Chenoweth and Stephan 2011). Democracy scholars typically assert that freedom of the press is essential for keeping the citizenry informed and holding governing officials accountable (Diamond 2008; Müller 2014). Civil resistance campaigns also rely on media coverage, so when state authorities have enough control over the media to stifle or skew reporting, this mechanism is weakened (Davenport 2007; Earl 2003; Martin 2015; Themudo 2013). However, when states' efforts to close off channels of information are incomplete or circumvented, there may be an added layer of backfire, as the attempt to undermine journalism can draw more sympathy for nonviolent campaigners. Furthermore, civil resistance campaigners can innovate alternative media and encourage citizen journalism (Howard and Hussain 2013; el-Nawawy and Khamis 2013).

disputes among political organs or officials devolve into destructive action (Mainwaring, et al. 1992; O'Donnell and Schmitter 2013). Civil resistance campaigns prefigure the kind of conflict management necessary to sustain democracy by refusing to threaten the lives of opponents, even under the direst of circumstances. While remaining nonviolent in the face of repression is no guarantee for political transformation, the contrast for civil resistance is the violent actions and existential threats made by armed insurgents, which propel cycles of destructive conflict (Kriesberg and Dayton 2017). When civil resistance campaigns are disciplined enough to achieve their immediate objectives without taking up arms, there are wider ramifications for the political order. In the unfolding popular discourse, skeptics and spoilers lose support for their claims that only violent action will suffice for real change (Cortright 2009). Participants in a civil resistance campaign not only gain proof to the contrary, but also practical experience as enfranchised civic participants. Campaign organizers, moreover, develop civic leadership skills that can be transposed to roles in emerging democratic institutions or transferred through networks of newly empowered civil society actors. Thus, this mechanism is deeper than ideational diffusion; it operates by expanding the social pragmatics of nonviolent conflict management (Vinhagen 2015).

Fifth, *civil resistance institutes practices of egalitarian self-governance*. This final mechanism speaks to the heart of nonviolent struggle. Civil resistance marries a respect for the universal right to life with a refusal to accept anything less than political freedom. This is not to impute moral superiority on every participant in nonviolent struggle; it is instead an observation about the essence of organized, disciplined, nonviolent movements for democracy. There may be prejudiced or violent participants in the mix, but the

overarching thrust of a civil resistance campaign fosters a culture of nonviolent opposition (Chabot and Vinthagen 2007; see Reed and Foran 2002). Like the establishment of procedures for nonviolent conflict management, a culture of nonviolent opposition is not just evident in a prevalent set of normative ideals, but also realized in common practices. Maximalist campaigns require sustained resistance by large numbers of well-organized participants. Such a degree of participation must be undergirded by the motivating forces of beliefs, customs, and practical repertoires (Vinthagen 2015; see Foran 2005; McAdam 1999; Tilly 2006). Successful civil resistance campaigns transpose the practices of nonviolent action onto broader political institutions, even after immediate goals have been met. In the contemporary era, pro-democracy campaigners are often aided by external actors seeking to expand political and economic liberalization around the globe (Ritter 2014). Savvy civil resistance campaigners utilize external support to establish new institutions for party formation, elections, and government accountability without becoming mere conduits for resource flows, or more importantly, without losing legitimacy among their population (Chenoweth and Stephan 2011). In short, a truly successful civil resistance campaign brings widespread ideals of peaceful self-governance to fruition and then propagates them forward with continual prefiguration (Vinthagen 2015).

To be clear, these five mechanisms are not meant to explain all that democratization entails. They relate to the phenomenon of civil resistance within democratic transitions, connecting the explanations of how civil resistance works with the findings that civil resistance is more likely than armed insurgency to lead to democracy. Perhaps in tension with the most ardent defenders of the agency position, the

prefigurative mechanisms are meant to be complementary to other factors permitting and steering revolutionary change—couched in an explanatory framework of configurational causation (Goldstone 1991; Foran 2005; Holmes 2012). A complete discussion of the causes of political insurrections and democratic transitions is well beyond the scope of this dissertation; so, although this theoretical primer engages a wide literature, the following analytical focus is by necessity narrowed to tracing the dynamics of just five specific mechanisms. The key assumption is that multiple social forces have to align for a civil resistance campaign to prefigure democratic governance, achieve regime change, and realize democracy. This point can be proven with a single case study; instead, resting on the point's establishment in the works cited above, the remainder of this chapter confirms its applicability to the Egyptian case, and draws out lessons for the scholarship on the efficacy of civil resistance.

### 1.5 Civil Resistance Mechanisms in Egypt's Contentious Transition

This section examines the mechanisms of civil resistance in application to the case of Egypt, demonstrating how they intersected to prefigure democracy and how their weakening and misalignment corresponded to disruptions in the process of democratization. For evidence, it draws upon a variety of primary sources, including local and international news reports, photo books, memoirs and testimonials, websites of political parties and activist organizations, and weblogs and social media posts. It also incorporates findings from secondary sources, including scholarly books and articles, reports from policy analysts, and critical reflections from Egyptian public intellectuals. These sources are not meant to provide a complete history or reach a final verdict on the causes of political change in Egypt, but rather to answer a pointed question: in what ways

did civil resistance advance democratization via prefigurative mechanisms, and in what ways did it not? Given the process orientation, however, the following narrative traces carefully through key events chronologically, with enough detail to reveal the mechanisms' unfolding.

#### 1.5.1 Regime Challenges Leading up to 2011

In order to determine how the recent civil resistance campaigns changed the political order in Egypt, one must first review some important prior challenges to the state. Here the concern is actions aimed at least in part at democratic reform, initiated by civilians outside the regime's wide bureaucratic umbrella.

First, the Muslim Brotherhood had been an ongoing challenger to Egyptian autocrats for the better part of a century (Wickham 2013). With its deep roots in rural mosques and congregations of recently urbanized workers established by the charismatic populist Hasan Banna in the 1920s, the Muslim Brotherhood maintained credibility with the populace. When Hosni Mubarak took the Office of President in 1981, he began with a strategy of limited inclusion of moderate Islamists. But when the Muslim Brotherhood won a significant portion of local elections and available opposition seats in the People's Assembly in the early 1990s, Mubarak responded by shifting to a more contentious posture vis-à-vis Islamists, particularly the Muslim Brotherhood (Wickham 2002, 2013). Throughout the 1990s and 2000s, Mubarak's regime maintained the upper hand on the Muslim Brotherhood by cycling between escalating repression and offering limited concessions (Osman 2013).

Second, after twenty years in power, the Mubarak regime began to face renewed pressures from the liberal side of the political spectrum in the 2000s (Osman 2013;



Rutherford 2013b). Elections were already widely known to be fraudulent, and they were increasingly viewed as a farce by Egypt's youth (Weddady and Ahmari 2012:49-57). The *Kefaya* Movement (in Arabic, *kefaya* means *enough*), a grassroots coalition with broad support among Egypt's youth, emerged in direct opposition to Mubarak's move to seek a fifth term in 2004. *Kefaya* did not prevent Mubarak from remaining in office, but it maintained popular appeal through the next few years, especially for its firm opposition to hereditary rule (Abdelrahman 2015; Oweidat, et al. 2008).

The other major opposition movement to emerge late in Mubarak's career was the April 6 Youth Movement—so named because it began as an ad hoc coalition in solidarity with textile workers in the city of Mahalla, who planned their first major strike on April 6, 2008 (Alexander and Bassiouny 2014). Young activists initiated the movement with a Facebook group, inviting users to participate in a national general strike (Ghonim 2012). Many pledged their support through the Facebook group, and when the strike in Mahalla was repressed, the Facebook group and other blogs disseminated videos and reports to Egypt's population centers, garnering support and mobilizing more protests (el-Nawawy and Khamis 2013; Radsch 2008). The April 6 Youth Movement Facebook group grew in popularity and spawned new avenues for dissemination of information, including blogs, Twitter feeds, and YouTube channels (Brym, et al. 2014; el-Nawawy and Khamis 2013). Mubarak's regime attempted to contain the flurry of opposition, but the April 6 Youth Movement organizers continued organizing civil disobedience actions despite police repression and a relative lack of popular support on the ground.

Third, spikes in the prices of staple foods stoked popular discontent across the Middle East and North Africa in 2010. Harkening the bread riots of 1977, Egypt saw a

variety of disorganized protests and self-immolations (*Ahram Online* 2011d; El-Wardani 2011). To compound the restlessness, Egypt also saw in 2010 a flare in tensions between Islamic extremists and the Coptic Christian community (*Ahram Online* 2011a; *Aljazeera* 2010a; Weddady and Ahmari 2012:157-160). Mubarak's regime received much of the blame for these sectarian attacks due to lax policing (*Ahram Online* 2011b).

Fourth, the regime's use of violent force on citizens became more significant in the public consciousness after Egyptian police officers publicly beat to death Khaled Saeed, a young man widely believed to have committed no crime, in June 2010 (Gelvin 2012; Trew 2013). In response, the "We Are Khaled Saeed" Facebook group emerged, along with concordant protests against police brutality (*Aljazeera* 2010b; Ghonim 2012; Olesen 2013).

These four background threads show significant and growing mobilizing potential leading up to 2011, with economic strains and moral shocks converging in 2010 in particular. They do not, however, make it obvious that a successful insurrection was on the horizon. Mubarak's regime handled many challenges by the Muslim Brotherhood, and it weathered several waves of protest from *Kefaya* and the April 6 Youth Movement. The conclusion from these precursors to civil resistance in 2011 is that ample capacities were converging at a ripe moment. The right catalyst could initiate a chain reaction, but the outcomes were by no means pre-determined.

### 1.5.2 The Tipping Point at Tahrir Square

With the necessary ingredients in place for massive protests in Egypt, the final inspiration came from the successful uprising against President Ben Ali in Tunisia in January 2011 (Rutherford 2013a). The January 25, 2011 demonstrations were

strategically timed to coincide with Egypt's National Police Day (Abdul-Ghaffar 2011; Hamza 2011; Idle and Nunns 2011). Many organizing bodies contributed to the unprecedented mobilization. Chief among them, at first, were the "We Are Khaled Saeed" and April 6 Youth Movement Facebook groups, but there was no central leadership (Ghonim 2012; Rutherford 2013). The organization was rooted in pre-existing entities, but the campaign was turning it into something new and transcendent.

Different segments of Egyptian society, with different grievances, were united by the priority to end Mubarak's presidency and prevent him from establishing a dynasty. In Cairo, middle-class, tech-savvy individuals coordinated online and formed activist coalitions in their neighborhoods. As they marched through other neighborhoods toward the city center, they recruited bystanders from open air markets, storefronts, and doorsteps. News of the size of the marches spread by word of mouth, drawing more eager participants to be a part of the voice of the nation. A similar pattern of mobilization occurred in Alexandria and other city centers on the same day (Ghonim 2012; Rashad 2012).

The Mubarak regime responded swiftly by repressing demonstrators across the country, but the repression largely backfired, sparking more and larger protests on January 26 and 27 (*Ahram Online* 2011c; Rashad 2012). Despite the shut-down of Internet services across the country and mobile phone services in central Cairo, decentralized networks of participants continued to coalesce through face-to-face interaction (Lindsay 2012). When confronted by police, the semi-organized groups splintered in multiple directions, separating friends and forcing everyone to rely on strangers for support. Thousands of small crowds formed solidarity with one another in

the moment, constantly moving around to dodge police and reconnect with more people. The dispersed and re-sorted masses were able to overwhelm police barricades and evade arresting officers (El-Ghobashy 2012). Elsewhere in Cairo, and in other sites of protest around the country, workers' organizations played a key role in mobilizing ongoing resistance (Alexander and Bassiouny 2014). Laborers, educated young activists, shopkeepers, and all kinds of bystanders intersected to animate their political demands in the streets. This was the kind of massive, inclusive participation that characterizes successful civil resistance campaigns—and the dynamics of street protest amplified solidarity.

On Friday, January 28, “The Day of Rage,” larger numbers congregated at Tahrir Square. Demonstrators sacked Mubarak’s National Democratic Party offices in downtown Cairo and overran police stations across the country (Idle and Nunns 2011; Fahmy and Tobgy 2011; Shokr 2012). Movement organizers affiliated with the April 6 Youth Movement, along with many other self-appointed crowd monitors, pressed for nonviolent tactics (see *The Atlantic* 2011). Overwhelmed by the numbers, many police units retreated. Crowds in Cairo swelled on February 1—the so-called “Million Man March”—and began an around-the-clock sit-in in Tahrir Square (Fahmy and Tobgy 2011; El-Ghobashy 2012; Ghonim 2012). Telecommunications were partially restored on January 29, but the Internet remained down until February 2 (Lindsay 2012). With or without communication technology, millions were aligning across polycentric networks to bring the entire country to a standstill. By the time established leaders like Nobel Laureate Mohamed ElBaradei and Muslim Brotherhood officials joined the protests, it

was clear that what was happening was no longer just a protest, but a serious inversion of the political order (Abdelrahman 2015; Rutherford 2013a).

Exuberant crowds held ground in Tahrir Square, manifesting a collective effervescence that cannot be overstated. People coordinated their own microcosm society right in the public square, complete with a medical center, spaces for political dialogue, and religious services (Keraitim and Mehrez 2012). There were even citizen security officers to ward off thieves and break up fights. Muslims and Christians took turns praying under the guardianship of the other (Shokr 2012; Winegar 2012; Gregory 2013). Hundreds of thousands of Egyptian citizens, especially the youth, experienced the most profound spirit of national unity of their lives—a stark contrast to the repression and sectarian tension of previous years. And the camaraderie was not just an ephemeral sentiment; it was concretely enacted as self-governance in the heart of the city, broadcast on television for all to see.

Courted by the opposition and sensing that Mubarak’s days were numbered, the Egyptian Armed Forces shifted from a defensive posture to a neutral posture. In a deliberate effort to undermine the command structure while preventing further repression, demonstrators chanted “The People and the Army Are One Hand” and engaged soldiers cordially (Khalil 2011; Shukrallah 2013). The Egyptian military’s top commanders responded to the threat of crippling impasse by betraying Mubarak and siding with the popular resistance, which struck many at the time as an incredible move toward civilian accountability (see Nepstad 2013a, 2011b). Lacking both police officers and soldiers, on February 2 Mubarak sent a mishmash of loyalists and mercenaries to try to clear Tahrir Square with blunt instruments and a makeshift cavalry. During what became known as

“The Camel Battle,” the calls for nonviolent discipline that had so far been strong faded as protesters fended off the assaults for hours on end with stones torn from the sidewalks, all while army troops watched from the sidelines (*Aljazeera* 2011). In the midst of clashes, military officers had also set up a detention center next to the Antiquities Museum (just off Tahrir Square), where dozens of activists were interrogated and tortured (Idle and Nunns 2011). Nevertheless, demonstrators insisted that revolutionary action was aimed at Mubarak’s regime and not the military infrastructure, continually beckoning the army to heed the will of the people.

Over eighteen days, the emergent civil society in Tahrir Square, as well as parallel occupations of public space in other cities, held up against every last-ditch effort to break them. Those left standing were keenly aware that they were fortunate to survive. On February 11, Vice President Omar Suleiman announced that Mubarak was resigning after thirty years in office. The Defense Minister, Field Marshal Hussein Tantawi, became the interim political leader, backed by the Supreme Council of the Armed Forces. Victory celebrations kept the nation up all night. For those participating in the campaign, it felt like a revolution (El-Khawas 2013).

Mubarak, the National Democratic Party, and many other components of the regime fell as a result of several aligning conditions. Not all of the conditions can be attributed to civil resistance alone, but in the process of regime change all five mechanisms of civil resistance were clearly functioning. The January 25 campaign was broadly inclusive, fostering unprecedented civil society participation organized in a polycentric structure. The masses effectively held Mubarak’s security forces in check, winning unexpected tacit support from army troops and beginning to form civilian-based

procedures for nonviolent conflict management. On the whole, millions of citizens saw their demand for regime change realized, giving them new faith that their higher ambitions for genuine democracy in Egypt were attainable.

### 1.5.3 From the Anti-Mubarak Campaign to Partial Democratization

In the wake of the victory over Mubarak, protesters remained in Tahrir Square calling for sweeping reforms under the banner, “Bread, Freedom, and Social Justice.” However, many bystanders pressed for a return to business as usual, especially the shopkeepers in downtown Cairo. With numbers and moral support waning, the Tahrir Square sit-in gave way to security force incursions in March 2011 (Stack and El-Naggar 2011). Although the January 25 campaign was thus effectively over, smaller nonviolent demonstrations still recurred weekly as multiple civil society networks kept people engaged. Much of the contestation centered on transgressions committed by the Supreme Council of the Armed Forces in early 2011. Activists in Cairo and Alexandria set up projectors and screens in public to show damning video evidence of military abuses and expose the commanders as liars (Soror 2012; Taher 2011). Professional associations, labor unions, and other workers’ groups also continued resisting with strikes and protests through most of 2011 (Alexander and Bassiouny 2014).

It is unclear whether the interim regime under Field Marshal Tantawi felt constrained by these protests, but it did push ahead with the first constitutional referendum in March 2011. The citizenry was divided between those who wanted to continue the revolution, and therefore repeal the hastily drafted constitution, and those who wanted to restore order quickly, and therefore accept the new constitution and work

to reform it later. The latter won out at the polls, undercutting the mobilizing capacity of the former (El-Khawas 2013).

Meanwhile, the spirit of interreligious solidarity from the January 25 campaign began to unravel as the trend of attacks on Coptic churches from late 2010 picked up again. In particular, after an assault on a Coptic church in Aswan in late September 2011, a crowd of peaceful protesters gathered on October 9 at the Maspero building in Cairo—the headquarters of the state-run Egyptian Radio and Television Union. State security forces then gunned down two dozen people right in front of the media (*BBC News* 2011; Chammah 2014). The Coptic minority was left yet again feeling threatened by shadowy militants and betrayed by the state.

For those holding onto the dream of a true social revolution through civil resistance, the crescendo came in the late-fall. On November 18, 2011, thousands of demonstrators gathered on Mohammed Mahmoud Street (adjacent to Tahrir Square) to honor those killed in the January 25 campaign and to protest Tantawi's recent declaration of new constitutional revisions (El-Khawas 2013; Kirkpatrick 2011). The military leadership responded by deploying forces to disperse demonstrators with live ammunition. Clashes continued between protesters and military forces for days. Flanked by graffiti-covered concrete walls on one side and high-rise edifices on the other, protesters surged up the street toward military positions but were repelled, literally bleeding out into Tahrir Square. Scores were killed and injured—a second generation of revolutionary martyrs (*BBC News* 2012b; al-Jaberi 2012; Ryzova 2011). The massacre exposed Tantawi's counter-revolutionary mission, crystallizing opposition to the interim regime with a spate of protests across the country. But the events on Mohammed



Mahmoud Street also exposed the waning capacity of unarmed resisters to leverage bystander support to deter the armed forces from repression.

Protests persisted despite the challenges of sustaining an inclusive coalition and weathering repression, with the diffuse network of civil resistance organizers displaying remarkable focus and resilience (*Egypt Independent* 2012). Youth activists from the Muslim Brotherhood and the April 6 Youth Movement were often able to mobilize sizeable crowds in multiple cities. As the January 25 anniversary drew near, many activists believed they would overcome Tantawi the same way they overcame Mubarak (Trew 2012). They were now better organized and more disciplined in nonviolent methods than they were the year before—and battle-hardened, no less. The nationwide dispute over what self-governance should look like in the immediate, however, stunted the ongoing challenge to the remnants of the old regime. Centrist and leftist elites tended to endorse continued civil resistance, while a sizeable portion of Muslim Brotherhood affiliates sheared off to focus on electoral politics (El-Khawas 2013).

Parliamentary elections began November 28, 2011, just days after the massacre at Mohammed Mahmoud Street. The Muslim Brotherhood had created a new political party, the Freedom and Justice Party, in April 2011. With the nationwide campaigning capacity it had built up over decades, the Brotherhood was able to put forward many successful candidates for the People's Assembly (Wade 2013). The Tantawi regime de-emphasized the importance of these results and shifted focus to the upcoming presidential elections in May 2012, offering concessions as protests ramped up for the anniversary of Mubarak's ouster (El-Khawas 2013). The Freedom and Justice Party, meanwhile, sought to sustain its momentum in the polls. It selected Dr. Mohamed Morsi, a lesser-known

member of the Brotherhood's upper echelon, as its candidate for president. The military leadership put forward Ahmed Shafik, an Air Force commander and former interim Prime Minister, as its presidential candidate. An inchoate liberal coalition began to form around the leadership of ElBaradei, but he withdrew from the presidential race claiming that it was not formed by a genuine democratic process (Kirkpatrick 2012).

The electoral field thus created a dilemma for many Egyptians. Some aligned with ElBaradei, boycotted the elections, and helped build the Constitution Party, which pressed for comprehensive constitutional reform before any more elections (Hizb el-Dostour 2013). Several other factions and independent candidates split the votes among moderates and socialists. The May election then came down to a run-off in June 2012 that simplified the fissures: Shafik, representing the embattled remnants of the former regime, versus Morsi, the only alternative available to a discontented populace. It was a free and fair election, and for most Egyptians, it was the first for which they could not predict the outcome (El-Khawas 2013). Morsi narrowly defeated Shafik to become the inaugural president of the post-Mubarak era. After all the attempts by the interim regime to manipulate the process, the presidential election was a testament to the enduring efficacy of civil resistance. And yet for a large portion of the activists who struggled for over a year for this outcome, having Muslim Brotherhood insiders at the helm was an unsettling compromise.

#### 1.5.4 Civil Resistance to Elected Leaders

Morsi's election was a momentous event for the Muslim Brotherhood most of all, but the wind in its sails would soon become turbulent. Though its hands were tied by the results of a popular vote it supported, the Supreme Council of Armed Forces used its

remaining political and economic capital to jockey against Morsi. Morsi responded by dismissing Field Marshal Tantawi and promoting Abdel Fattah el-Sisi, the prior Director of Military Intelligence, to Defense Minister in August 2012 (*BBC News* 2014; Hearst 2012). While they supported Morsi's upheaval of the old military power structure, those involved with the many liberal and moderate political parties were still searching for a role in the government as the Freedom and Justice Party favored loyal Islamists to fill the cabinet and state bureaucracy (El-Khawas 2013; Samak 2012).

At the same time, the adverse economic conditions had not been remedied. Inflation remained high, and wheat flour remained in short supply. A population eager to grow in its newfound self-determination was stuck trying to make ends meet. Manual laborers started striking more often, as their wages took a disproportionate hit (Alexander and Bassiouny 2014). The Freedom and Justice Party was simply unprepared to manage economic and political crises at the same time (Bowen 2013). In October 2012 crowds gathered at Tahrir Square to protest the lack of progress under the new government. Supporters of Morsi then formed a counter-demonstration, leading to street fights between the two factions (Leyne 2012). In retrospect, these enflamed confrontations foreshadowed a polarized field of contentious political action that would derail the process of democratization.

With a second constitutional referendum approaching in December 2012, Morsi announced on November 22 that he would temporarily assume greater executive powers. The upcoming referendum was thus framed by many as a vote of confidence in the Muslim Brotherhood as leaders of the nation (Wade 2013). Voters approved the referendum, which gave Morsi confidence in his position, but his policies remained hotly

contested (*BBC News* 2012a). Several moderate and liberal figures, including ElBaradei, joined to form the National Salvation Front (Black 2012; El-Din 2012). It was the first major oppositional coalition since the January 25 campaign, and their goal was to hold Muslim Brotherhood leaders accountable to keep the country on track for pluralist democratic governance (Abdelrahman 2015; *Ahram Online* 2013).

Despite its backing by several political parties, the National Salvation Front engaged not in party politics, but in protest mobilization (see Saleh 2013). In January 2013, as the second anniversary of the January 25 campaign approached, the Front began a series of protests in Tahrir Square with support from *Kefaya* (Aboulenein 2013b). Major protests also grew in Alexandria and the Suez region, and the security services under Morsi's leadership used deadly force to repress them, sparking further protests at the presidential palace in Heliopolis (Kingsley and Hussein 2013; Kirkpatrick and El Sheikh 2013). National Salvation Front leaders refused to dialogue with Morsi and encouraged a widespread boycott of the next round of parliamentary elections scheduled for April 2013 (*Associated Press* 2013b; Fleishman 2013). The defiance resonated with many, but it did not engender the same kind of national solidarity as the January 25 campaign had. The 2011 campaign united all sectors against a common opponent. The 2013 mobilization was pitting liberals and moderates—mostly from the middle and upper classes—against Islamists and their conservative supporters—many of whom came from lower classes (Abdelrahman 2015; Allinson 2015).

The Freedom and Justice Party, in response to escalating threats from all sides, entrenched itself yet deeper, vehemently defending Morsi and his decrees. This then served to convince the growing opposition that a new wave of contentious action was

indeed its only recourse. By late spring 2013, the tide was turning against the Freedom and Justice Party. The courts delayed the parliamentary elections pending constitutional review, preventing the Muslim Brotherhood from repeating its electoral successes (Aboulenein 2013a). Hundreds of thousands had mobilized to demand Morsi's resignation, with organizational support coming from many youth activists and workers' groups beyond the National Salvation Front auspices. Flyers and banners introduced a new campaign called *Tamarod* (in Arabic, *tamarod* means *rebellion*), which was led by lesser known members of *Kefaya* and focused on pressuring Morsi to resign with a national petition campaign (BBC News 2013; El-Fekki 2015; Kingsley 2013b). Muslim Brotherhood supporters countered *Tamarod* with their own signature campaign, called *Tagarod* (in Arabic, *tagarod* means *impartiality*) (Daily News Egypt 2013).

The April 6 Youth Movement also aligned with the National Salvation Front in the anti-Morsi campaign (Azeem 2013). The slogans of unity between the army and the people from 2011 were recycled, but this time the Egyptian armed forces actively endorsed the opposition (Shukrallah 2013). Absent the specter of violent repression, the demonstrations opened up into the most festive atmosphere since the January 25 campaign, encouraging more and more ordinary citizens to take part. *Tamarod* spokespersons even claimed to have gathered an astounding 22 million signatures from citizens withdrawing their confidence in Morsi (Abdullah 2013). This uprising had numbers and diverse participation, with relatively novel tactics and multiple fronts of resistance organized through decentralized networks, but it did not represent the whole population in the way the 2011 uprising had. And that missing segment of the society was mobilizing in the reverse direction.

The main gathering for the campaign against Morsi began on June 30, 2013, selected to mark one year since Morsi assumed office (and subsequently becoming the date to mark the whole campaign). Hundreds of thousands swarmed Tahrir Square, even occupying the Mogamma Building—a prominent symbol of the state bureaucracy in downtown Cairo (Noureldin 2013). Pro-Morsi activists organized a huge counter-demonstration at the intersection adjacent to Rabaa al-Adawiya Mosque in Cairo—a few miles East of Tahrir Square. Similar pro- and anti-Morsi demonstrations emerged in many other cities as well, with millions on both sides engaging in civil disobedience to shut down intersections, ports, and government offices (Nagi 2013). Between the divided protests, the nation had reached an impasse.

On July 1, the *Tamarod* organizers demanded that Morsi step down immediately (Abou Bakr 2013). The military, under Sisi's command, then issued a follow-up ultimatum: Morsi must concede to early presidential elections and resign as acting president within 48 hours (Kirkpatrick and Fahim 2013). The National Salvation Front welcomed support from the military but cautioned against its direct involvement in politics (Khaled 2013). In a lengthy statement reminiscent of Mubarak's final speech, Morsi stood defiant, citing the legitimacy of elections and pointing to the multitudes of supporters in the streets (Kirkpatrick and Hubbard 2013). On July 3, Sisi announced that the military had removed Morsi from office, suspended the constitution, and appointed Chief Justice Adly Mansour Acting President (Perry and Saleh 2013). Jubilant crowds at Tahrir Square cheered it as a second victory of people power, while those at Rabaa al-Adawiya denounced it as a coup (Kirkpatrick 2013).

### 1.5.5 The New Autocracy

As soon as the electricity of the mass movement to oust Morsi dissipated, the Egyptian military asserted itself widely, coopting leaders of the anti-Morsi coalition into interim positions within the state bureaucracy and taking the lead in constructing a new political order. Defense Minister Sisi claimed a mandate from the people to reestablish the nation, pulling pages from the handbook of Mubarak's regime to frame contentious action on part of the Muslim Brotherhood as sedition and terrorism (Fahim and El-Sheikh 2013b). Sisi purged the Freedom and Justice Party from the government and blocked the Muslim Brotherhood's communication outlets, while he kept Morsi in military custody illegally (Fisk 2015; Kirkpatrick 2013). Security forces swiftly dispersed anti-coup protesters in many locations around Cairo, escalating to violent force much more rapidly than they had during the prior two years (Fahim and El-Sheikh 2013a). Morsi's supporters consolidated in the encampment at Rabaa al-Adawiya Mosque, as well as a second location, El-Nahda Square, several miles southeast of Downtown Cairo. The security forces tolerated sit-ins at these two sites for just over a month. Troops then ambushed them on August 13 and 14, 2013, slaughtering hundreds of civilians in one of the worst atrocities in the history of modern Egypt (Human Rights Watch 2014).

Shocked by the bloodshed, some of the leaders of the anti-Morsi coalition defected—most notably ElBaradei, who had been serving as interim Vice President (Taha 2013b). Security forces, meanwhile, quickly swept up the traces of the massacre and pressed forward in its stated quest to root out enemies of the state (Chick 2013). The courts outlawed any involvement with the Muslim Brotherhood (*Aljazeera* 2013b). What remained of the anti-coup movement rallied around the moniker *R4BIA*—a reference to

the massacre at Rabaa al-Adawiya (*Aljazeera* 2013a; Zelinsky 2013).<sup>12</sup> The *R4BIA* activists persevered in spite of stiff restrictions, but in short bursts, with relatively small numbers, and distant from Rabaa Al-Adawiya, Tahrir Square, and similar political hot spots (Daragahi 2013).

Shortly after arresting Morsi, Sisi had announced a roadmap for political transition beginning with revising the constitution during the summer of 2013, proceeding with parliamentary elections in the fall of 2013, and concluding with presidential elections in early 2014 (*Associated Press* 2013a). With the elimination of the Muslim Brotherhood from the scene, the National Salvation Front and *Tamarod* began shifting toward electoral politics, vowing to keep the ambitions of the June 30 campaign alive through parliamentary positions (Ashraf 2013b; Taha 2013a). Interim President Mansour then placed tight restrictions on all public gatherings (Kingsley 2013a), and *Tamarod* splintered over whether to remain a movement or become a political party only (Ashraf 2013a). After some delays, the constitutional referendum took place in January 2014, the main changes being the deletion of Islamist clauses added under Morsi and the insertion of language strengthening the roles of the military and police. The de facto military rulers ensured that the new constitution was overwhelmingly approved in the polls by squashing critics, including activists from the diminishing April 6 Youth Movement (Kingsley 2014). The forces of repression, cooptation, marginalization, and fragmentation gutted the June 30 civil resistance campaign within just a few months.

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<sup>12</sup> *R4BIA* stems from an alternate English transliteration of Rabaa (al-Adawiya), the numeral 4 inserted to highlight the meaning of the Arabic word *rabaa*, i.e. *fourth*. An outstretched hand with four fingers erect is a symbol of the anti-coup movement for the same reason.



The new constitution stipulated that presidential elections precede parliamentary elections, so the Egyptian Electoral Commission slated the former for May 2014. Sisi was the obvious presidential candidate for the military leadership, as he had risen to iconic status through the propaganda surrounding Morsi's removal (Stack 2013). Sisi's lone opponent in the race was Hamdeen Sabahi, a stalwart liberal and co-founder of the National Salvation Front. But much like elections under the Mubarak regime, Sisi effectively ran unopposed, capturing over 96% of the votes in a highly suspect polling process (Kirkpatrick 2014). Sisi entered office promising security and economic development. He began implementing both through displays of military strength, increasing the presence of armed forces in the streets and around college campuses, attacking militants in the Sinai, trying civilian dissidents in military courts, and employing the Egyptian Army in a massive project to renovate the Suez Canal (*BBC News* 2014; Human Rights Watch 2015; Loveluck 2014; Marshall 2015; Saba 2014).

Many new political parties and coalitions began ramping up for the parliamentary elections in mid-2014, but they were beset by a series of delays after Sisi took office (Youssef 2014). The first phase was finally launched in October 2015, and the second phase concluded in December 2015. The whole process was tainted by candidate list manipulation, polling place violations, and low voter turnout (*Daily News Egypt* 2015; Hussein 2014). Ultimately, nineteen parties won seats in parliament, the largest number going to the Free Egyptians Party—one of the member parties of the National Salvation Front that supported the forced removal of Morsi. However, the majority of seats actually went to independent candidates who pledged support for Sisi, including many former

members of Mubarak's National Democratic Party (*Ahram Online* 2015; Tahrir Institute for Middle East Policy 2015).

## 1.6 Conclusion

This chapter provided a reconciled accounting of the ambiguities surrounding the theorized link between civil resistance and democratization in the Egyptian case (2010-2015). It began with a synthesis of the relevant themes from the nonviolent action literature in the concept of democratic prefiguration, which is fleshed out in five mechanisms: fostering inclusive political participation, organizing civil society, establishing civilian checks on authority, implementing procedures for nonviolent conflict management, and instituting practices of egalitarian self-governance. Scrutiny of the social dynamics surrounding two major civil resistance campaigns in Egypt yielded specific insights into the variable operation and interaction of the mechanisms, illustrating how nonviolent uprisings can be robust enough to realize anti-regime objectives yet still fall short of establishing democratic governance. One finds evidence that political change occurred when all five civil resistance mechanisms were functioning and reinforcing each other. After a watershed moment like Mubarak's ouster, however, the mechanisms do not just continue with frictionless forward motion. Prefigurative mechanisms have to be propelled continuously in order to become realized outcomes, and many contingencies may alter their course.

In particular, there is strong evidence that prefiguring democracy through inclusive participation is not merely about mobilizing large numbers, as is easy to infer from recent research on civil resistance. Crucially, it is also about ensuring that a campaign represents the whole governed population, and not just momentarily. Masses

can come together for a short period of time and overthrow a ruler, and then in the course of further contestation, masses can diverge over the particulars of the new political order. This is what happened between Egypt's liberals and Islamists after Mubarak fell. Socio-economic and religious differences can indeed be bridged through civil resistance, as happened in the January 25 campaign, but that does not mean any bridges will hold for the long term, especially not if efforts to buttress them fade. Moreover, social divisions can be overcome well enough to wage a successful civil resistance campaign against a ruler even without including large segments of the population, as happened in the June 30 campaign. But partial representation only weakly prefigures democracy. The Egyptian case thus reaffirms the theorized conditionality of this mechanism: in order for civil resistance to usher a transition from regime change onward to democratization, the opposition coalition needs to be comprehensively and sustainably inclusive.

One also learns from this case the difficult lesson that the development of cultures of nonviolent resistance may lead to political dynamics that are conducive to anti-regime campaigns but not to democratization. The methods of noncooperation work by undermining political institutions, and once proven effective in a given case, they may be re-used, or even over-used. Hence, pro-democracy activists in the National Salvation Front and *Tamarod* jettisoned from new formal institutions of democracy and used extra-institutional methods as correctives to unfavorable policies, only to have their institutional breaches provoke a counter-movement and precipitate a coup. All this is understandable given a framework of interdependent prefigurative mechanisms. In addition to the requirement for inclusive participation, the mechanisms of organizing civil society and instituting practices of self-governance would ideally align with the

mechanisms to keep security forces in check and manage conflict nonviolently. If an anti-regime campaign itself undermines fledgling democratic institutions, then one should only expect it to advance democratization if it provides a more viable pathway. If, by contrast, civil resistance against developing democratic governance proceeds without a clear vision, then the Egyptian case gives one good reason to be wary of other, more decisive actors who may step in and turn a crisis into an opportunity.

As much as these insights add to the literature on civil resistance, they do not resolve the matter of how civil resistance campaigns effectively move from prefiguration to realization. If one accepts that disentangling the operation and interaction of the mechanisms of civil resistance helps explain mixed results, then one is still left to wonder, what explains the mechanisms' dynamics? In order to build theory in that regard, it is necessary to shift modes of inquiry in order to get a better handle on the conditions surrounding civil resistance campaigns and identify patterns. Rather than make the common—and quite reasonable—broadening move to comparative case studies, this dissertation doubles-down on the Egyptian case and mines its internal variation for deeper insights. As the remaining two chapters explain, there is much to be gained from scrutinizing the relational dynamics among the players in the Egyptian field of contention before, during, and after the campaigns of 2011 and 2013.

CHAPTER 2:  
THE CONTEXT OF CIVIL RESISTANCE  
IN EVOLVING COMPLEX NETWORKS OF CONTENTION

2.1 Introduction

In January and February 2011, Egyptian activists occupied Tahrir Square for eighteen days in an historic campaign for democracy. Thousands of unarmed demonstrators fended off assaults from state security forces and regime loyalists, forcing the government into a political crisis it was unprepared to manage. The resignation of Hosni Mubarak after decades of authoritarian rule spurred a dramatic political transition in the country. After the crescendo, demonstrators ebbed and flowed around Tahrir Square many times. No single demonstration matched the masses of the anti-Mubarak campaign until June 30, 2013, when millions converged in downtown Cairo to protest newly elected President Mohamed Morsi and the Islamist political bloc he represented. That time it took just four days to push the President out of office. And that time the military commanders did not simply announce the change; they authored the ultimatum and removed Morsi by force when he refused their terms.

Immediately following the January 25, 2011 campaign, the most pressing questions about civil resistance in Egypt seemed to concern its origins. Given the aftermath of the June 30, 2013 campaign, however, the more pressing questions concern

the dynamics and outcomes of civil resistance in Egypt—that is, the processes that explain how civilian-based movements brought down presidents and began an unprecedented transition to democracy, but ultimately resulted in another autocratic regime. Chapter 1 made a case for interrogating the distinct mechanisms by which civil resistance prefigures democracy, in order to understand the mixed results. That analysis showed how some mechanisms can converge well enough to force a head of state out of office, even though they lack key components of civil resistance efficacy in the long run. The 2013 campaign, though it was large, disciplined in its use of nonviolent tactics, and garnered the support of pillars of regime power, stood at odds with major swaths of the population—specifically, Muslim Brotherhood supporters and other conservatives backing Morsi. A key lesson for civil resistance researchers was that the powerful factor of inclusivity in nonviolent methods—the “primacy of participation” in Chenoweth and Stephan’s (2011) terminology—loses its potency when it does not prefigure the kind of representative inclusivity that is necessary for democracy.

As much as a shift in focus to the mechanisms of civil resistance helps explain ambiguous outcomes that do not fit well in prevailing theories, it still leaves open questions about the precise dynamics of disruptive forces that may hinder the prefiguration of democracy during periods of political contention. This chapter moves the case study into the finer details of evolving contentious relations with novel applications of network science methods to conflict data. The specific research question here is, *what patterns in the changing structure of contentious relations help explain the different gradations of success for the two major civil resistance campaigns in Egypt?* The responses to this question given below are meant to be theoretically generative, rather

than empirically generalizable. There are many other cases of civil resistance, and this dissertation is premised on the features of the Egyptian case being unusual. Yet the project also rests on the assumption that there is significant theoretical value in analyzing cases that do not fit general explanations, because that is how researchers uncover causal mechanisms obscured by statistical central tendencies (see George and Bennett 2005; Goertz and Mahoney 2012; Ragin 2008). And it turns out that there are several theoretically germane insights to be gained from scrutinizing the evolution of contentious relations networks in Egypt, as there is here a rare opportunity for paired comparison within one broad context.

In short, this chapter shows that the contentious action field, measured as the network of actors and targets linked by specific conflict events reported by reputable international newswires from 2004 to 2014, became dramatically more complex after the 2011 campaign—with sharp increases in size and clustering. In addition, the proportion of violent events and relations increased, and the network shifted from multifaceted opposition to the central government to segmentation by social identity categories. Together these findings make it clear that with the wave of contention unleashed in early 2011, the field in Egypt indeed became much more complicated, reinforcing the narrative given in Chapter 1.

However, this chapter brings new evidence to make the case that it is an issue of simplicity-versus-complexity, and not order-versus-chaos. It may be tempting to think of the surge of contention over these few years as a wild storm, and subsequently to conclude that any vessel of civil resistance launched within it would be fated to capsize. Not so. In network terms, the relational context actually became much more structured

than would be expected if sampled at random from all possible networks of the same size. If there is some decipherable structure to a given field, then there is also the potential for navigation, prediction, and even manipulation. And so, the evidence presented serves the important initial task of charting the waters. Once everything has been laid out, it will be apparent that the structured features of the Egyptian case indeed allow for theory-building beyond its idiosyncrasies.

The chapter proceeds by outlining the necessary theoretical and methodological foundations for the analysis of dynamic networks of contention in the second and third sections. In the fourth section, it elucidates the reasoning behind the metrics used to track patterns over time and answer the research question. Section 2.5 provides details on data sources and methods, including descriptive statistics, and section 2.6 contains a suite of empirical analyses to make the case. The chapter ends with a discussion section (2.7), rather than a conclusion, because in fact there is a second part to the story told by the conflict event data. When one knows who acts against whom, one can also infer who acts jointly with whom by virtue of their mutual opponents. It is therefore possible to measure the dynamics of cooperation alongside the dynamics of opposition. And that is the subject of Chapter 3.

## 2.2 A Relational Understanding of Contentious Politics

It was previously posited that one can make sense of thorny cases like Egypt by adjusting one's perspective to consider not only factors across cases, but also dynamic processes within cases. The process orientation is in fact common in the study of conflict going back to Georg Simmel (Simmel 1955 [1908]; see Cooley 1927; Coser 1956; Dahrendorf 1958; Deutsch 1949a, 1949b, 1973), and analysis of process is standard in the



study and practice of conflict resolution (e.g., Kriesberg 1973; Lederach 1997; Mayer 2000; Pruitt and Rubin 1986; Ramsbotham, et al. 2011; Wallensteen 2015). The main dynamics of interest are phases of escalation and de-escalation, vicious spirals of threats, defensive posturing, and destruction, and the re-organization of social identities, alliances, and competitive endeavors (Kriesberg and Dayton 2017). All of these plainly apply to national-scale nonviolent struggles as well as they do to interpersonal conflict, but the dedicated scholarship on nonviolent action has not engaged much with them.<sup>13</sup>

While the influential studies of civil resistance of the past two decades certainly do not ignore process (see Ackerman and Kruegler 1994; Chenoweth and Lewis 2013; Chenoweth and Stephan 2011: Part II; Sharp 1973: Vol. 3), much of the civil resistance research of late zeroes in on campaigners and relies more heavily upon agentic theories of change than the background literature on conflict warrants. Advocates of strategic nonviolent action especially tend to frame their arguments in contrast to “structuralist” explanations—e.g., arguments that economic development or regime strength determine outcomes more so than civilian action—without giving adequate consideration to context in the way a conflict-as-processes orientation would (see Chenoweth and Stephan 2011: Ch. 3; Johnstad 2010; Karatnycky and Ackerman 2005; Marchant 2008; Sharp 2005: Part 3). Although many other works trace the complex histories of different nonviolent movements (e.g. Bartowski 2013; Clark 2009; Roberts and Ash 2009; Zunes, et al. 1999), none so far have applied a relational understanding of conflict dynamics to an analysis of civil resistance, so there is plenty of room for new research in that vein.

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<sup>13</sup> Noteworthy exceptions to this summary statement are Richard Gregg’s *The Power of Nonviolence* (1966) and *The Psychology and Strategy of Gandhi’s Nonviolent Resistance* (1972).

In exploration of the lacuna, Chapter 1 began by couching the phenomenon of civil resistance within the wider framework of contentious politics. McAdam, Tilly, and Tarrow (2001) established this approach to cast a wide conceptual umbrella over the dynamic processes present in social movements, waves of protest, and revolutionary episodes. They argued that several common mechanisms—such as opportunity-threat spirals, brokerage, and modular diffusion of tactics—pervade a wide variety of contentious political interactions (McAdam, et al. 1996, 2001). Some predecessors have already shown the applicability of these mechanisms to civil resistance and worked to integrate theories across literatures (Nepstad 2011a; Schock 2005, 2013), and Chapter 1 engaged in a further effort of synthesis with elaboration of the prefiguratively democratic mechanisms of civil resistance. The purpose at this point is not simply to apply the McAdam-Tilly-Tarrow template to civil resistance studies more extensively than in Chapter 1. What adopting a framework of contentious politics means from a methodological standpoint is that the present research is foremost concerned with understanding the patterns that unfold in processes of contentious interaction. As in many works of conflict studies and contentious politics research, the patterns of primary interest are *relational*: the ties and interactions among social actors, how they are structured, and how they change over time (see Crossley 2011; Donati 2012; Emirbayer 1997; Mische 2011; Somers 1994, 1998).

Given the concentration on a single tough case, this chapter operates with a more concrete objective than theorizing grand relational patterns across the full scope of cases. The focused task is to look as directly as practicable at the dynamics of contentious relations in Egypt and identify theoretically interesting patterns surrounding the key

events of 2011 and 2013. Unlike most formal network analyses the social movements and collective behavior literature (e.g., Baldassarri and Diani 2007; Gould 1991, 1993; McAdam and Paulsen 1993; Melucci 1989; Wang and Soule 2012), this is not a search for patterns surrounding individuals' decisions to engage in activism or the coordination and diffusion of tactics among civil society associations. And unlike Tilly's (1978, 1995, 2006, 2008) seminal research on contentious interactions, the priority here is not the intricate characteristics of claims-making and tactics in contentious relations. Instead, the angle of observation is, as of the time of writing, novel: the structure of relations among parties to conflict when the contentious interactions are concatenated into a network. Being untested in the relevant literature, the network-analytical methods are applied inductively at this point. The lens used to maintain focus throughout this inductive investigation is the foundational work of Simmel.

Only a few crucial elements are necessary to motivate the network analyses of this and the next chapter. Simmel began with the simple observation that in order for two or more actors to be in conflict, they must have specifiable relations between them (1955 [1908]). He distinguished between direct and indirect conflict (1955 [1908]: 56ff). The former involves plain actions by at least one party against at least one other on account of their divergent interests. The latter involves competition between parties with divergent interests without manifest actions of one against another. In the present usage, any mention of "conflict" refers to *direct* conflict.

Simmel famously theorized that conflict between social groups tends to make each respective group more integrated (1955 [1908]: 85ff)—a lesson passed on in conflict studies for generations (Cooley 1927; Coser 1956; Dahrendorf 1958; Oberschall 1978).

He viewed this not as an essential feature of any particular social grouping—as in the common notion that nation-states are borne out of warfare (Tilly 1990)—but rather as a universal relational pattern. The simultaneous attracting and repelling forces of contestation manifest at multiple social levels, from interpersonal conflict to interstate warfare. The dynamics are constantly in flux as history plays out, which serves to define and redefine social collectivities over time. Thus, the collective actors engaged in conflict should not be treated as fixed in some timeless social ontology (see Emirbayer 1997). Rather, from a Simmelian-relational understanding, studies of conflict should attempt to encompass multiple levels of analysis, as well as oscillations over time (see Kriesberg and Dayton 2017).

That may seem a daunting task for researchers, but the proposal now is that one can make great headway by emulating Simmel’s elegant weaving of theory and observation. If one strips everything down to the bare forms, there are essentially just two types of relations to consider. There is first the divergence between two or more conflicting parties, termed *opposition*, which can be measured as the dyadic presence or absence of some form contention between parties. Second is the convergence among actors within a contentious milieu, termed *cooperation*, which can be measured as the dyadic presence or absence of some form of alignment among parties.<sup>14</sup> These are certainly not the only relations that structure society, and they both may be evident in

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<sup>14</sup> Note that these concepts are not embedded in a moral framework. A major reason to adopt a Simmelian perspective is to show that conflict itself is not necessarily bad for social groups. That conflict is natural has become axiomatic among many conflict specialists (see Kriesberg and Dayton 2017). Nevertheless, one should acknowledge the normative connotations of the words “opposition” (negative) and “cooperation” (positive). The concepts cannot be rendered entirely value-free, but one can endeavor to use the terms with precise relational denotations and keep the moral questions open for both.

multiple manifestations (Simmel 1955 [1908]: 20ff). Furthermore, conflict should not be assumed to be the only source for either type of relation. Cohesive relations in particular clearly have many sources (Friedkin 2004; Stein 1976). But in the most general sense, if one can observe just these two relations among some delimited set of parties to conflict, then one has enough to examine the basic structures of relationality in conflict using the powerful tools of network science.

This chapter examines only the first type: opposition. In fact, it operates narrower still, limiting the purview to explicit, public acts of contention reported in reputable international newswires. The scope is much broader than civil resistance, however, as it includes violent assaults alongside peaceful protests, and participation in the contentious events ranges from one to over a million persons.<sup>15</sup> This then sets the specific aspects of context under consideration: the major civil resistance campaigns of 2011 and 2013 are embedded within the web of known contentious acts taking place in Egypt before, during, and after the campaigns. The full network is treated as a fair depiction of the field of contention in Egypt at the time.<sup>16</sup>

### 2.3 Defining Networks of Contention

Networks are used to represent the field of contention in Egypt, with directed edges representing oppositional relations among those entities present in the field at a

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<sup>15</sup> See the section 2.5 and the Appendix.

<sup>16</sup> The term “field” is used in a loose sense, to signal a relatively amorphous socio-political landscape. That is to say, there is no claim to operate within an apparatus of “field theory” (Fligstein and McAdam 2012); deliberate effort has been taken avoided any more theoretical commitments than are necessary to construct the networks and look for patterns.

given time. As much as the theorization endeavors to keep things simple, there are several matters to explicate in order to justify the particular ways this chapter moves between theory and data.

### 2.3.1 Contentious Relations: Events, Actors, and Targets

For the present purposes, contentious relations are defined by concrete acts of contention, occurring in observed “events,” initiated by “actors,” and directed toward “targets” (see Butts 2008). Events can be identified straightforwardly by date and location, perhaps with additional information about the nature of contention—but essentially just recording the who, what, where, and when. Actors and targets can take a great many forms. In contentious politics, actors are commonly civilian protesters—perhaps organized in a named association, or perhaps gathering spontaneously—and targets are commonly governing bodies. In the general sense, actors are defined by their engagement in a given contentious action, so that their identification—be it atomized or collectivized—is determined by the available records of contentious events. Targets in the general sense can be more ambiguous, because contentious actions very often are not aimed directly at tangible social persons or institutions, but rather at symbolic forms—as in anti-war protests—or at property and other physical objects. It may well be the case that behind every nominal target of modern protest is the central polity (Tilly 1978), but there is no need to impose such interpretations on data reporting contentious action. In principle, contentious acts may possibly be initiated by any social actor toward any entity in the field of contention—including back to the actor itself, as in undifferentiated group in-fighting. Definitions of actors and targets are relative to specific events, and events are relative to identified actors and targets—as befits the relational understanding. As for the

particular records of these relativized definitions, this analysis uses a curated conflict event dataset from academic researchers, trusting that their recording of event data is reasonably accurate and consistent.<sup>17</sup>

The flexibility allowed in the definition of actors and targets is somewhat at odds with conventions among social network analysts, but the issue is semantic, rather than technical. Mathematically, a graph is defined by a set of entities (vertices) and a set of connections between pairs of those entities (edges)—perhaps ordered pairs to indicate directionality, and perhaps weighted in multiplicities (Bollobás 1998). Ordinarily, the entities in a social network are individual persons, and the connections are undirected, unweighted interpersonal relationships (Wasserman and Faust 1994), but graph theory itself does not restrict the analyst in those regards. A vertex can be literally anything—a person, a group, a country, or even an abstract concept like religious extremism. Likewise, an edge can be any sort of relation between vertices—a friendship, a licensing contract, a peace treaty, or just an instance of some form of influence. There is no formal requirement that all vertices be the same type of entity, nor that all edges depict the same relational characteristics. What is necessary is that all elements of a graph be well-defined.

Whereas the boundary conditions of social networks commonly rest on a specific type of vertices—usually persons in a certain time and place—the networks of contention examined in this chapter have boundary conditions loose enough to permit any sort of entity identified as an actor or target in a conflict event (but no looser). For actors, this

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<sup>17</sup> See section 2.5.

includes everything from named individuals to generalized social identity categories (e.g., “citizens”). Targets also include inanimate objects (e.g., “police vehicle”), physical locations (e.g., “border checkpoint”), and symbols (e.g., “the constitution”)—although the majority of targets in the dataset are explicitly social.<sup>18</sup> Aside from the obvious criterion that actors and targets be identified in the source data, the baseline requirement for contentious relations is that at least one vertex—specifically, the source of the contentious act—be an entity bearing some form of agency, which is of course necessary to engage in direct conflict.<sup>19</sup>

If one were to exclude non-social vertices from a contentious relations network, then one could introduce biases in the analyses. While it is true that the Simmelian foundations do not clearly apply to non-social entities, it is also true that contentious action classically includes the targeting of property and symbols (Tilly 2003; Gamson 1990; Martin, et al. 2009), so the picture of a field of contention would be incomplete without them. Furthermore, while some network metrics do not make perfect sense for non-agents—such as reciprocity and clustering—it is useful to know quantitative values for these metrics regardless of whether some vertex pairs cannot possibly have edges between them. For example, if two networks are similar in many respects but differ in reciprocity, the reason may be that the distributions of entity types across targets differ. If the edges with non-social targets were dropped, then the modified versions of these two

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<sup>18</sup> In the dataset used in this dissertation, 75% of all targets and 85% of all vertices are individuals, collectivities, or organizations (including government agencies). The remainders consist of events, places, and objects. See the Appendix.

<sup>19</sup> This provides a clear distinction between the rather liberal network constructions applied herein and those of actor-network theory (Law 1992).



networks may not differ. That fact could also be interesting, but it would not be possible to observe if non-social vertices were excluded from the outset. It is therefore maintained that the contentious relations used to construct networks should be as complete a depiction as one can give for the full field of contention.<sup>20</sup>

### 2.3.2 Aggregation and Evolution

With contentious relations measured by events, the natural boundary specifications for contentious networks are time and place. A complete graph aggregates all available contentious relations, thus setting the temporal scope as the span from the first to the last moments of observation and the spatial boundary as the union of all locations of observation. Although it is possible to let each event represent a unique edge (making a multigraph), multiple edges between the same vertices are instead collapsed into weighted edges—where the weight is simply the count of events occurring during a given time period. This consolidation makes visualization cleaner without destroying any information.

Subgraphs may be extracted based on subdivisions of time (e.g., calendar months) and space (e.g., political geography), as well as any arbitrary selection criteria by the properties of the vertices (e.g., identity category) and edges (e.g., tactics). Any of the above inducements may produce overlapping subgraphs, and when they do, a universal criterion of inclusivity is preferred. For example, if a dataset records the duration of events in days, and if one wishes to induce temporal subgraphs that are nominally

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<sup>20</sup> In this case, excluding non-social vertices did not change the substantive findings, so the analyses below are based on networks that include all types of vertices.

discrete (e.g., calendar months), then one can include all contentious relations which occurred in any part during a given time window. This results in some blurring of boundaries between subgraphs, but it is necessary to accurately and consistently report what was happening when. An alternative would be to discretize events by the smallest temporal unit available for events—such as days, making unique edges for each date in their duration. But if one is also collapsing multiple edges into weighted edges, the net effect of that alternative will be the same as using inclusive criteria on events of variable duration.

When examining time-series network data, it is also common to induce greater overlap intentionally using temporal windows moving in increments less than their width, which smooths out temporal fluctuations (Moody, et al. 2005). For data measured in fixed intervals, this generates moving averages, but one should note that for subgraphs induced from events measured in variable intervals and merged inclusively, the resulting measurements in moving windows are not always averages of measurements for subgraphs induced at the minimum temporal scale.

In addition to subgraphs induced from (relatively) discrete periods and moving windows thereof, network dynamics can be measured cumulatively in fixed increments over time, which effectively shows the evolution of the complete graph. It is common in network science to assume a growth model, even when measuring a snapshot of a network (Albert and Barabási 2002; Newman 2003). In particular, so-called “scale-free” networks are simulated by growing just a few vertices and edges at a time, with connections drawn with a probability proportional to the existing vertices’ degrees—that is, via “preferential attachment” (Barabási and Albert 1999). So then measuring the actual

growth of a network allows one to see growth patterns directly and test hypothetical link-formation mechanisms (Albert and Barabási 2002). Even more basic than that, cumulative graphs show what the fluctuations in limited periods add up to, and whether there are any particular moments in history when the overall trajectory changed.

## 2.4 Graph Metrics and Patterns Relevant to Contentious Relations

Research on dynamic social networks often aims to predict the presence or absence of relations, as well as transmission across relations, based on vertex attributes, prior relations, and perhaps other network structural features (e.g., Butts 2008; Christakis and Fowler 2008; Moody, et al. 2005; Snijders 2001). Certainly, similar goals would apply for contentious relations networks, which could improve efforts of risk assessment, early detection of destructive conflict escalation, and intervention. But in the relatively uncharted territory of extracting networks from conflict event data, it is best not to jump into predictive modeling before carefully specifying what patterns in graph structure are present and interpreting their meaning. Following the case narrative of Chapter 1, the present search is guided by two headings. It was indicated that the field of contention in Egypt became more complex after the 2011 uprising, so it must firstly be established which graph metrics are used to assess the types and magnitude of complexity, and to track specific changes in complexity. It was also indicated that the field changed in the arrangement of social identity categories and tactics, so it must secondly be established which techniques are used to measure these forms of segmentation. Although it does not take the next step into predictive modeling, this chapter does offer some suggestions for doing so in section 2.7, based on the findings in section 2.6.

### 2.4.1 Complexity

The baseline for complexity in a network is the number of elements it contains: vertices, edges, and connected components (Butts 2001; Hall and Preiser 1984; McCabe 1976). While higher counts of elements are *prima facie* indications of greater graph complexity, these values are more useful to compare and contrast graphs whose scope conditions do not obviously determine differences in complexity—as in networks in the same location at different times. In networks with directed edges (i.e., digraphs), there are two ways to define connected components: (1) a component is *strongly* connected if for every pair of vertices there is a directed path between them in both directions; and (2) a component is *weakly* connected if for every pair of vertices there is a path between them when edge directionality is ignored. Thus, digraphs often have many more strongly connected components than weakly connected components. The use of weakly connected components is preferred because it more plainly captures how many parts of a graph are entirely segmented. In a field of contention, the number of weakly connected components effectively indicates how many non-interacting sub-fields of contention there are.

Graph density is often used to compare graphs of different sizes by taking the number of observed edges and dividing it by the number of possible edges, given the present vertices. However, when multiple edges are permitted (or when edge weights are unrestricted), as in the construction of networks of contention used here, graph density becomes undefined. Moreover, graph density does not account for connected components. McCabe (1976) provided a helpful alternative way of summarizing baseline graph complexity, called the *cyclomatic number*,  $v(G)$ , which is equal to the number of edges, minus the number of vertices, plus the number of connected components:

$$v(G) = |E| - |V| + |C|.$$

Cyclomatic numbers with weakly connected components are employed as the first-pass comparison of graph complexity. In a single value, the cyclomatic number effectively indicates how much elementary information is required to describe a graph: the greater the cyclomatic number, the greater the baseline complexity.

The next step is to assess complex structuring within connected components. There are many ways to measure structure within a connected graph, and it is neither feasible nor theoretically justifiable to perform all of them. The heuristic used here is to measure general structural features that are known in the network science literature to be rare in random graphs but common in real networks. By “random graph,” network scientists typically mean a graph generated with specified numbers of vertices and edges, such that every pair of vertices has a uniform probability of gaining one of the edges—as established by Erdős and Rényi (1960). So-called “Erdős-Rényi” random graphs are easy to simulate and can be used to draw out the range of possible topologies among graphs of given vertex and edge counts. And one of the hallmarks of “a complex network” is that it is statistically anomalous among Erdős-Rényi graphs of the same size (Albert and Barabási 2002). The most prominent non-random characteristics of real networks are clustering and scale-free degree distribution.

The extent of clustering in a graph is assessed in two summary metrics. First is the (global) clustering coefficient, which is based on the classic sociometric concept of transitivity (Heider 1946, 1958; Holland and Leinhardt 1971), and which is measured as the proportion of all connected triads that are fully connected (Watts and Strogatz 1998). In digraphs, triadic closure must be cyclic (forming a loop of edges all flowing in the

same direction; e.g., A to B, B to C, and C to A). As with weakly connected components, it makes sense to measure the clustering coefficient without respect to directionality in networks of contention. The clustering coefficient on undirected contentious relations can then be interpreted as the proportion of conflict spirals and (e.g., A to B, B to C, and C to A) and feed-forward motifs (e.g., A to B, B to C, and A to C) among sets of three entities that are weakly connected. The clustering coefficient is known to be much higher in many social networks than in Erdős-Rényi graphs with the same number of vertices and edges. Given the Simmelian (1955) foundations, and the known role of transitivity in balance theory (Heider 1958), it is reasonable to anticipate that networks of contentious relations as constructed may also have clustering coefficients significantly higher than most congruent random graphs.

A complementary measurement of clustering is the average shortest path length, which is given by the arithmetic mean of the shortest (directed) path lengths (i.e., graph distances) between all pairs of vertices (Watts and Strogatz 1998). It captures the typical quickness with which transmissions could spread across a network (Albert and Barabási 2002). It can only be defined in connected components, so it is only applied to the largest weakly connected component (by vertex count) of a given graph. A connected digraph would have to be cyclic (as opposed to tree-like) in order to have defined paths between all pairs of vertices, so following the same logic as with the use of weakly connected components, networks of contention are reduced to undirected graphs before computing average shortest path length. The substantive interpretation of it then is the average minimum number of contentious events needed to connect two actors or targets. As made famous by Milgram's (1967) "small-world problem," social networks are known to have

much shorter average shorter path lengths that would be expected in Erdős-Rényi graphs (Watts 1999, 2003). If clustering is higher than expected at random in networks of contention, then average shortest path lengths should be lower than expected at random.

When considered dynamically, the two clustering metrics can quantify changes in relative network complexity: in general, increases in clustering coefficients and decreases in average shortest path lengths correspond to increases in complexity. However, since the computation of shortest path lengths has been restricted to the largest connected components, increases in this metric may be driven by growth in size of the largest connected components. In the present case, observed values are compared to expected values in similarly sized Erdős-Rényi graphs, so determinations about the magnitude of complexity at different times can be made by comparing observed values directly, as well as by comparing the relative statistical significance of each.

A more absolute measure of complexity is scale-free structure, because its defining feature is that the same abstract form holds whether scaled up or down—much the same as nested patterning in fractals (Barabási and Albert 1999). To be considered scale-free, the distribution of vertex degree (the count of edges coming from or going to each vertex) must follow a power law—a kind of long-tail distribution with exponential decay (Clauset, et al. 2009). In other words, power-law degree distribution means the proportion of vertices with low degree values is quite high, and the proportions decrease exponentially as degree values increase, but there remain some extremely large and extremely rare degree values. Such a degree distribution is not expected in Erdős-Rényi graphs, which have binomial degree distributions, tending toward Poisson the larger they get (Albert and Barabási 2002; Bollobás 1981; Erdős and Rényi 1960). But scale free

structure is common in real networks across domains, and the explanation popularized by Barabási and Albert (1999) is the aforementioned preferential attachment mechanism for network growth. Preferential attachment is the networks equivalent of the “Matthew effect” (Merton 1968), where instead of the rich getting richer, the better-connected vertices keep attracting more edges (see Price 1976). The general reasons to look for scale-free structure in real networks are to see whether they diverge from the norm in random graphs (an indication of complexity) and to check whether preferential attachment is a plausible mechanism for the growth of the network.

For conflict networks, to have a scale-free structure means that a small portion of entities are engaged in a large portion of conflict, so much so that if one took a relatively small, random sample of known entities and examined their contentious relations only, one would almost certainly miss the bulk of the contentious action. It also implies a process model in which entities with a history of more contentious interaction are more likely to be engaged with new entities entering the field. Furthermore, if networks of contention are scale-free, then it would serve as concrete evidence for the Simmelian notion that conflict has the same fundamental order to it, regardless of the level of analysis.

One issue is that scale-free structure is itself less amenable to comparison over time than other complexity metrics. A graph is deemed to be scale-free if its degree distribution fits well-enough to a parameterized power law. The power-law exponent may differ slightly between scale-free graphs based on their best-fitting parameters, but that does not directly indicate differences between structures. However, scale-free graphs can



be distinguished from one another by scrutinizing degree values further with assortativity metrics (Li, et al. 2005).

In general, degree assortativity summarizes the correlation of degree values between all connected vertex pairs, such that when high-degree vertices tend to connect to other high-degree vertices, there is “assortative mixing” (or more succinctly, “assortativity”) in the graph, whereas when there is a negative correlation between degree values in connected pairs, a graph is disassortative (Newman 2002). In digraphs, it is more telling to disaggregate assortativity by in- and out-degree (Foster, et al. 2010). This is an especially helpful supplement to tests for scale-free structure, because the degree distributions used to fit power laws sum in-degree and out-degree across all vertices. Therefore, four different degree correlations are measured in contentious relations networks: in-in; out-out; in-out; and out-in. If a network of contention is in-in-assortative, then frequent targets of conflict tend to target other frequent targets of conflict. If it is out-out-assortative, then frequent initiators of conflict tend to target other frequent initiators of conflict. In-out-assortativity means frequent targets tend to target frequent initiators, and out-in-assortativity means frequent initiators tend to target frequent targets. The theoretical backdrop outlined above does not lead one to specific expectations for the different forms of degree assortativity, so they are used rather to be more precise about what is behind scale-free structure, thus allowing comparisons within the aggregate.

#### 2.4.2 Segmentation

As rigorous as the metrics of network complexity are, they are also quite abstract, so they need to be paired with more substantive measures of the constitution of the field of contention. That can be achieved by considering the characteristics of vertices and

edges, checking not only for changes in global proportions, but also for any structural segmentation by these characteristics. The trade-off in making these observations is that they do not lend to easy comparisons with random graphs, instead requiring much more advanced techniques to determine statistical significance (Snijders 2001, 2005). Those techniques are impractical for comparing the thousands of graphs induced over the yearly, monthly, and weekly intervals between 2004 and 2014. Nevertheless, progress can still come with the modest objective of making theoretically interesting, but case-specific, observations.

A natural thing to do in sociometry is measure the extent to which relations are homophilous—that is, whether connected vertices tend to share similar traits (McPherson, et al. 2001). That intuition is channeled in this analysis by grouping entities involved in conflict into mutually exclusive social identity categories—that is, by assigning vertex “colors” in graph-theoretic terms. A network can then be reduced by vertex color, such that all vertices of the same color are represented by a single (categorical) vertex, and all edges among the original vertices are collapsed into weighted edges among the reduced vertices. Edge directionality is retained by collapsing only those edges pointed in the same direction, and self-loops are subsequently permitted to show within-category conflict. This color-reduction effectively standardizes all of the contentious relations networks, so then their adjacency matrices can be used to track changes in inter-categorical relations. Adjacency matrices list the same set of vertices across the rows and columns, such that row labels indicate vertices-as-actors and column labels indicate vertices-as-targets. The cells thus indicate the presence of contentious relations among categories, and because the edges are weighted, the values in the cells

may range from zero to the maximum weight. By examining the arrangement of edge weights in these standardized matrices, one can see which categories tend to target which, and whether some categories are more commonly actors or targets than others. In the end, some conclusions about homophily may be reached in the aggregate, but by retaining all of the information contained in the weighted adjacency matrices, it is also possible to reach conclusions about homophilous and heterophilous dynamics.

Another intuitive method for describing the substantive structure of networks is to compute the centrality of vertices. While there are many centrality metrics (Wasserman and Faust 1994), this analysis sticks to degree centrality, which simply ranks vertices by the number of edges they have. With directed edges, one may obtain in-degree, out-degree, and the sum of the two (undirected degree). The central hubs of contentious relations networks can therefore be thought of in three ways: as targets, as actors, and as both. Centrality can be visualized in network diagrams by placing more central vertices closer to the two-dimensional center of the graph plot, and by enlarging the vertex size of the hubs. In the graphs presented below, vertices are labeled only by their colors—omitting their names—to limit visual clutter. Therefore, substantive degree information is reported for notable entities separately, in tabular form to allow quick comparisons between entities at different times. The result for interpretive purposes is the ability to inspect the specifics of contentious relationality to see who or what is central or peripheral, and whether and how their centrality changes over time.

Finally, if edge characteristics are available, it is worth knowing whether they bear on structure. When there are discrete edge sets among the same vertices in a graph, it is described as multi-layered or multiplex, and the methods for analyzing them are

actively researched in network science (e.g., Kivelä, et al. 2014; Mucha, et al. 2010; Snijders, et al. 2013). However, it is not presently helpful to further complicate the contentious relations networks in question by elaborating multiple edge layers. Instead, the focus is on one simple and theoretically relevant bifurcation of the tactics employed during contentious events: whether they were violent or nonviolent. Given the goal of constructing as complete a depiction of the field of contention as possible, it makes sense to keep violent and nonviolent events together in the networks. For easier visual inspection, edges can be colored by type. The proportions of each are measured within consolidated (weighted) edges to see where each lies in the networks, and to track changes in the overall nature of conflict. Degree metrics are also dissected by type to see who is more and less responsible for initiating each type of tactic, as well as who or what is tends to receive each type.

## 2.5 Data and Methods

Data derive entirely from the Social Conflict Analysis Database (SCAD), version 3.1 (Salehyan and Hendrix 2014a; cf. Salehyan, et al. 2012).<sup>21</sup> The database “contains information on protests, riots, strikes, and other social disturbances in Africa, Mexico, Central America, and the Caribbean. Whereas conflict data is generally available for large-scale events such as civil and international war, the purpose of this dataset is to compile information on other types of social and political disorder” (Salehyan and

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<sup>21</sup> The newest version of SCAD as of the time of writing is 3.3, which includes events through 2016. Updates to the dataset were not made publicly available until after this project completed the arduous phases of cleaning and recoding the data, as well as many of the analyses. There are no documented amendments to events occurring in Egypt before 2015.

Hendrix 2014b: 1). Each record was hand-coded by the research team based on international news reports—primarily *Associated Press* and *Agence France Presse* newswires—that were returned by the Lexis-Nexis search engine with a given country name and the keywords, “protest,” “strike,” “riot,” “violence,” or “attack.” An individual record “refers to a unique social conflict event. To define an event, the researchers determined the principal actor(s) involved, the target(s), as well as the issues at stake. Events can last a single day or several months. A conflict is coded as a single event if the actors, targets, and issues are the same and if there is a distinct, continuous series of actions over time” (Social Conflict Analysis Database 2016). While reporting biases undoubtedly create some selection effects, SCAD data is comprehensive within the specified scope—not sampled.

### 2.5.1 Extracting Network Data

SCAD was not originally intended to serve as a source of network data.<sup>22</sup> The extraction of dynamic network data from conflict event data is, as of the time of writing, novel for contentious politics research. But similar moves are well-established for other types of social relations (Butts 2008; Moody, et al. 2005; Robins, et al. 2001; Robins and Pattison 2001; Snijders 2005; Wasserman and Pattison 1996). Tilly’s (1978, 1995) seminal studies of contentious gatherings set a precedent for constructing event data in this field, and there are by now many excellent datasets. However, SCAD is unusual for its inclusion of a broad spectrum of action types, comprehensiveness within the space-time scope, and specificity about actors and targets. It was the only available dataset that

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<sup>22</sup> Personal conversations with co-creator Cullen Hendrix in February 2017 confirmed this.

contained the necessary data to examine the evolution of the contentious action field in Egypt before, during, and after the major civil resistance campaigns of January 25, 2011 and June 30, 2013.

To be clear, each of these campaigns is represented in SCAD by a single event—albeit nationwide, including millions of participants, and spanning multiple days in both cases. This means that all of the other events in the dataset comprise the context of the campaigns. It is true that there can be slippage in how an “uprising” is measured in event data. In the present case, it makes good sense to rest on the SCAD measurements in light of the historical narrative given in Chapter 1 and the methodology behind SCAD. In other cases, it may be more appropriate to measure a civil resistance campaign in many events, and perhaps to combine civil resistance events with simultaneous events to constitute one uprising. Yet in Egypt, the conversation about civil resistance leading up to this network analysis re-emphasized time and again that there were two major campaigns, each of which can fairly be described as an event in its own right.

The first step in obtaining the desired network data was to extract all available event records for Egypt in SCAD 3.1. This amounted to 1,396 events for the years 1990 through 2014, of which 1,381 events included explicit identifications of both actors and targets.<sup>23</sup> This chapter focuses on events from 2004 through 2014, a time window chosen to be narrow enough to highlight the immediate context of the January 25, 2011 and June 30, 2013 uprisings, but wide enough to show the evolutionary trajectory of contentious

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<sup>23</sup> The database includes geo-codes for all events and separates multi-location events as separate rows in the table. The source data on Egypt, therefore, came in 1,715 records, which were grouped by location code as part of the cleaning process.

action since the *Kefaya* movement began in 2004 (see section 1.5.1). However, the cumulative networks analyzed below represent all available data from January 1, 1990 up until a given cutoff within the 2004-2014 window. Because events may last multiple days, a given time window includes any that occurred in whole or in part during that window. Thus, the 2004-2014 window includes all events in the dataset that ended on or after January 1, 2004. December 31, 2014 is the last date of observation for Egypt in SCAD 3.1, so there was no need to censor on the other end. The narrowing leaves a working dataset of 1,270 events (with explicit identifications of both actors and targets).

The second step was to clean up actor and target data to make them suitable as vertices, which was neither technically nor theoretically trivial. The original event records included plaintext labels for the actors engaged in a given event and the targets of the event's actions, with some differences in spelling and synonymous descriptions. All of these labels were recoded using a custom classification scheme to generate a consistent taxonomy of all actors and targets (see Appendix). It was a deliberate decision to stick as close as possible to the original identifications. Other researchers might not have made the same choice, because it led to data features that could at first glance seem difficult to reconcile with the standard vocabulary of collective behavior. For example, the January 25, 2011 campaign is recorded in SCAD as a single event, with "Civilian protesters" as the actors and "Government" as the target. The event lasted 18 days, spanned the entire country, and had participation of over 1 million, but it is effectively just one edge in the network. The only modification made was to use canonical labels: "ProtestersCivilian" and "GovernmentEgypt" for the vertices. Others with case knowledge might have chosen to elaborate the actors into coalition members, such as the April 6 Youth Movement and

the Muslim Brotherhood. It would not be wrong to do so, but there are two reasons to refrain from it.

First, dissection of collective actors is a slippery slope. If elaborating named social movement organizations is more accurate than “civilian protesters” in cases like the January 2011 campaign, then surely it would be more accurate still to detail the organs of these bodies. For example, both April 6 Youth Movement and the Muslim Brotherhood had noteworthy factions at the time. Then there is the issue of distinguishing organized from unorganized elements of mass actions. Hard-core soccer fans were involved in the 2011 campaign, and they are specified as actors in other events in SCAD, so they could be included—perhaps even listed out by club. And what about specific individuals? It would be feasible to name many known public figures and their various affiliations listed out. All of these details are relevant to an investigation of conflict dynamics from a Simmelian-relational perspective. Indeed, all of this information would be worthwhile to tease out, but it was simply impractical to do so in any consistent or minimally rigorous manner for all 1,270 events examined.

In addition to the infeasibility of parsing all collective actors, the Simmelian-relational perspective no more compels dissection of collective actors than it compels aggregation of individual actors. If, for example, the January 2011 campaign had been recorded in SCAD with sundry movement organizations, labor unions, political parties, fan clubs, and public figures, then those with case knowledge would have recourse to object in the other direction. If ever there was an act of the Egyptian people as such, this was one. A researcher could elaborate a thousand distinct collective and individual actors, and still fall short of detailing the composition of this mass event by hundreds of



thousands. Moreover, many reports of the campaign, including that of Chapter 1, highlighted the intense and generalized social solidarity experienced by participants. Of all their organizational affiliations and social identities, a prominent theme among the participants is that they unified *as citizens* during those eighteen days for a common goal of democratization.

Thus, the data transformation proceeded without disputing how actors and targets were reported in SCAD—except to canonize spellings and use labels that could be categorized and filtered. SCAD contains three columns for actors and two for targets. At least one of each must be filled for each event. Any discrete lists of entities contained within single fields were segmented. Whenever such cleaning moves were not obvious, the event descriptions included in the dataset were consulted. The sum of all unique actors and targets for 2004-2014 amounts to 740 vertices.

The one interpretive move made with the vertices was to add categorical labels relevant to the case: civilians; activists; workers and unions; Islamists; political parties; government; police; armed forces; armed militants; and other. Notably, all non-social entities were placed in the “other” category. These ten categories were developed inductively from the original labels and event descriptions in SCAD, in conjunction with the historical case study in Chapter 1, and not based on structural positioning in the network. The categories are represented as mutually exclusive vertex colors, but they are not meant to imply that certain individual or collective bodies are fixed within each category. The allowed fluidity of entity identification is maintained by the fact that the vertices as labeled are not necessarily static or mutually exclusive. So then, by assigning a color to a vertex, the precise meaning is that an entity in the identified capacity, as

given by SCAD, fits within a category salient to the case. The complete table of categorized vertices is given in the Appendix, and interactive graphs with complete vertex data are available from the author upon request.

The third step was to insert the cleaned-up vertices back into the event records and transform them into contentious relations, manifested in directed edges. Most events contained just one actor and one target, so they simply became one edge each. For those events that included multiple actors and targets, contentious relations were permuted from all actors to all targets involved. Alternatives to pairwise permutation would be to group vertices into ad-hoc collective entities, or to construct hyperedges. The former was declined in keeping with the decision to rest on the original entity identifications in SCAD. Hyperedges were ruled out in keeping with the decision to avoid unnecessary technical complications. On both counts, the potential benefits of the alternatives were further attenuated by the fact that corollary networks of joint action were subsequently constructed for further analysis (see Chapter 3). With each event generating distinct contentious relations, this then gave a complete list of 1,747 (directed) edges for the 2004-2014 period. Multiple edges between the same vertices in the same time period are included, but they are collapsed into unique dyads (as weighted, directed edges), which then amounted to 1,061 for the 2004-2014 period.

Available data about event type were retained from SCAD and used to construct a binary indication of whether the tactics employed were primarily violent or nonviolent. SCAD codes all events by type—"organized demonstration," "spontaneous demonstration," "organized violent riot," "spontaneous violent riot," "general strike," "limited strike," "pro-government violence (repression)," "anti-government violence,"

“extra-government violence,” and “intra-government violence”—which were then segmented as either violent or nonviolent based on the detailed variable descriptions in the SCAD codebook (Salehyan and Hendrix 2014). Specifically, the following event types were recoded as “true” in a “violent” dummy variable: organized violent riot; spontaneous violent riot; pro-government violence; anti-government violence; extra-government violence; and intra-government violence. This left the following to be recoded as “true” in a “nonviolent” dummy variable: organized demonstration; spontaneous demonstration; general strike; and limited strike. Missing values for event type in SCAD were recoded as “false” for both violent and nonviolent types.

The fourth and final step in data preparation was to generate subgraphs for comparisons over time. Contentious relations were binned by calendar year, calendar month, cumulative from January 1, 1990 to successive calendar months, and three-week (21-day) windows moving in intervals of calendar weeks (Sunday-Saturday).<sup>24</sup> All bins are inclusive by date, creating the possibility of overlap in all nominally discrete time windows. As with the aggregate network for 2004-2014, within each narrowed period, multiple joint action relations among the same two entities were collapsed into single edges, weighted by frequency.

### 2.5.2 Applying the Relevant Metrics and Making Inferences

Following the above outline of relevant metrics and data processing, some additional points of clarification are needed about methods of analysis and inference. To

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<sup>24</sup> Experimental analyses were run on data binned by calendar quarter and three-month windows in intervals of calendar months, as well as 12-month periods shifted to center the anchoring events. The network metrics did not differ in theoretically significant ways with these alterations.

begin, it is important to reemphasize that the conflict event records on Egypt are presumed to be as comprehensive as they can be, given the scope conditions of SCAD. This is not to claim that SCAD captures every last instance of conflict in Egypt in the time range (certainly it does not), nor that the dataset is without bias or error (a dubious assumption), but rather to point out that the data analyzed here cannot be treated as a statistical sample of some population of contentious relations. When it is known that a dataset is not a probability sample from some larger population (nor some approximation of a probability sample), the logic of statistical modeling precludes direct inferences about the statistical parameters of the population on the basis of the sample. One is therefore left with two applicable modes of inference from the observations to any generalizations beyond them.

The first mode compares observed graphs to all possible graphs of the same dimensions. The statistical parameters of all possible graphs can be approximated by simulating a large number of random (Erdős-Rényi) graphs with the same vertex and edge counts and checking whether the metrics of the graph in question diverge from the central tendencies of the distribution of metrics for the random graphs—that is, via Monte Carlo methods. Monte Carlo methods are employed for the analyses of network complexity, including scale-free structure, cyclomatic number, clustering coefficient, average shortest path lengths, and degree assortativity. For each and every observed graph and subgraph (in every time window), 2,500 Erdős-Rényi graphs with the same vertex and edge counts were generated—amounting to several million simulated graphs in total. All observed and random graphs are directed, so any metrics that rely on undirected graphs do so by simulating on the basis of the unmodified graph and then

reducing the simulated graphs as needed upon application of the metric. In any case, the mean of a metric among the 2,500 simulated graphs becomes the expected value.

Because any of the observed metrics could be above or below their expected values, a two-tailed assessment of p-value is appropriate. Observed metrics with p-values less than or equal to 0.05 in the two-tailed test are deemed statistically significant.

Statistical significance in this mode is not a heuristic for distinguishing signals from noise, but rather for judging whether observed networks are unlikely to result from random construction processes. The assessment of statistically significant observations is leveraged in both directions. If an observed graph is statistically significant, then the structure of the graph warrants a theoretical explanation. If an observed graph is not statistically significant, then the implication is that the structure of the graph falls in line with most comparable graphs. In other words, if randomized assemblage is as good an explanation for a graph's structure as any, it means that what has been observed is easy to simulate and predict.

For the assessments of power-law degree distributions, the Monte Carlo methods need to be taken a step further, to maximum likelihood estimation methods for model fit. Here the question is not simply whether observed metrics are rare among congruent random graphs, but whether the observed distribution of values (degree) was plausibly drawn from a population following a particular (power-law) distribution, and more specifically, what the parameters of that distribution are (Clauset, et al. 2009). The best measure of difference between observed and parameterized distributions in this case is the Kolmogorov-Smirnov statistic, which gives the maximum distance between observed and expected values after the cumulative distribution function is applied to both (Clauset,

et al. 2009; Goldstein, et al. 2004). Because modeling of power-law degree distributions is well established in the literature, lookup tables for p-values associated to the Kolmogorov-Smirnov statistic are available, which were used in lieu of performing thousands of computationally expensive simulations for each parameterized model of each graph (Goldstein, et al. 2004; Newman 2005). However, unlike the basic Monte Carlo methods, fitting the observed degree distributions to power-law distributions also requires ruling out rival distributions, so logarithmic and geometric distributions were fit to the data and subjected to Kolmogorov-Smirnov and Pearson chi-squared post-tests as well (Clauset, et al. 2009). Finally, the plausibility of the preferential attachment mechanism was tested by computing Pearson correlations between vertex degree and later (normalized) increases in degree (Albert and Barabási 2002). These tests for scale-free structure in particular need to be rigorous because too many unsubstantiated claims have been made about power laws in empirical data, causing a back-lash in recent years (Stumpf and Porter 2012). But in the end, the mode of inference is the same: if networks of contention are indeed scale-free, then it is not likely the result of chance, and therefore warrants an explanation.

The second mode of inference is from the Egyptian case to comparable cases, which is done via analogy, rather than claims of statistical representativeness. This project was introduced as a case study of civil resistance—specifying the two major civil resistance campaigns that took place in Egypt between 2010 and 2015, demonstrating the applicability of common civil resistance mechanisms to both campaigns, and couching the broader series of events surrounding the campaigns in the general dynamics of contentious politics and social conflict. To the extent that one is willing to accept the

present theorization of these qualities, and to the extent that one can identify similar qualities in other cases, the patterns identified in the Egyptian case build up to hypotheses for the set of comparable cases. How loosely one chooses to interpret “comparable cases” is a question of how many qualities one considers important for analogous reasoning: the more qualities that must be shared, the fewer the comparable cases. While it is safer to stick to tight analogies with small case sets, the intention here is to present detected patterns in as general terms as conceivable, given the theoretical framework—hence, the use of abstract concepts from network science. This has the effect of setting a ceiling for logical induction and guiding further investigation below it. The presumption is that future empirical tests will be needed to delineate both the horizontal and vertical boundaries for the patterns—that is, to see how many cases are truly comparable and to calibrate the analytical generality of the patterns within the domains of civil resistance, contentious politics, and social conflict.

## 2.6 The Dynamics of Contentious Relations in Egypt

Now that the reasoning, data sources, and methods are clear, the analysis of the field of contention in Egypt can commence. The evidence is organized into three subsections. The first (2.6.1) addresses the aggregate structure of all observed contentious relations from 2004 through 2014. It includes summary descriptive statistics of the network and tests to substantiate the finding that the degree distribution best fits a power-law model. Subsection 2.6.2 presents the detailed analyses of time-binned subgraphs demonstrating increases in different forms of structural complexity after 2011. It includes the trends over time for graph size and composition, cyclomatic number, reciprocity, global clustering coefficient, average shortest path length, and degree assortativity. The

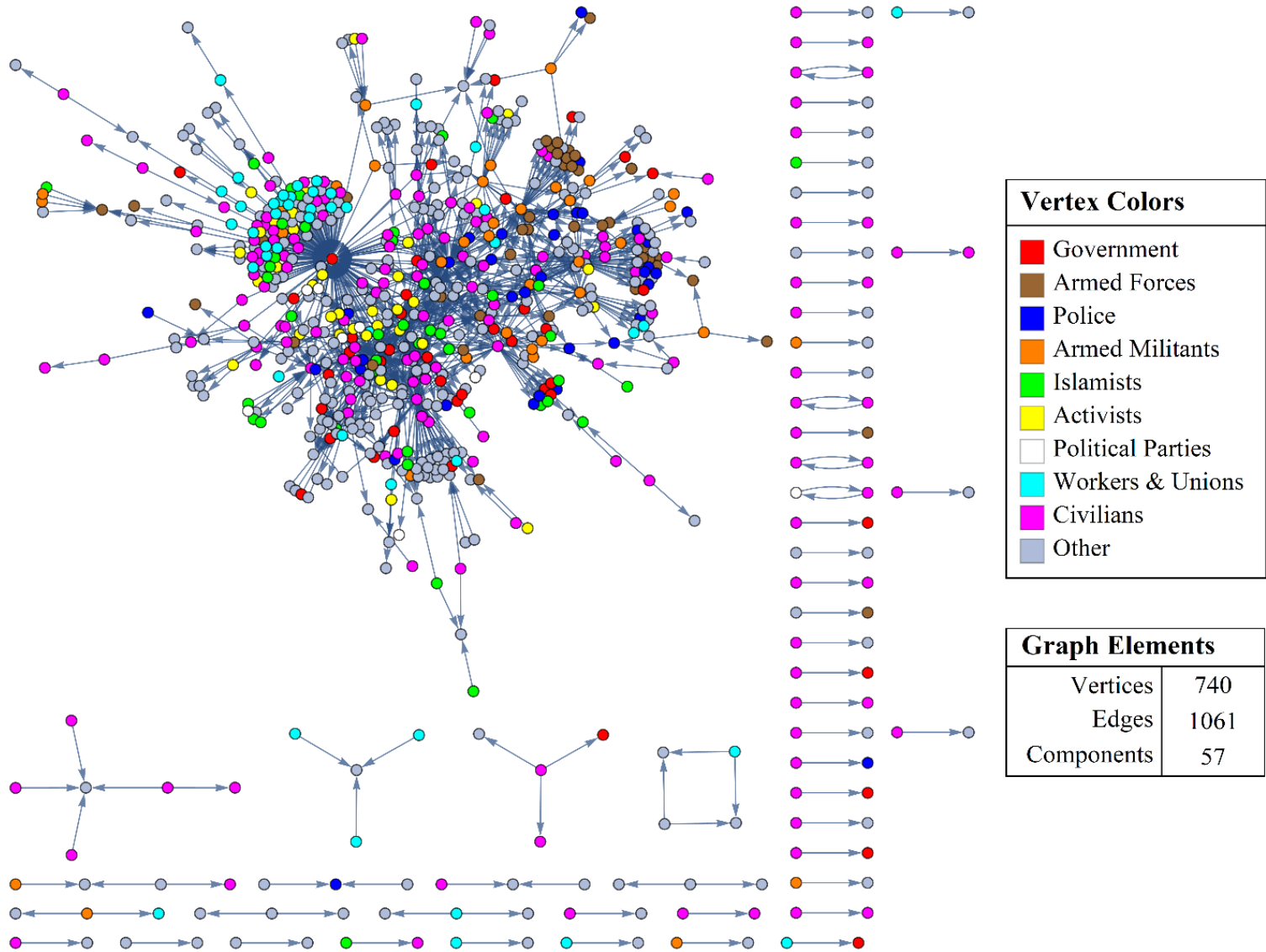
third and final subsection (2.6.3) covers the substantive features of the networks. It contains network visualizations, identifications of core and peripheral vertices, evidence of changing relations among entity categories, and proportions of violent and nonviolent relations. The findings are presented here with minimal interpretation, evaluations of them being reserved for the discussion in section 2.7. Note that data for the years 2004-2009 are included in many of the plots for reference, but left without comment on this period, except to highlight that certain trends emerging after the 2011 uprising were not just part of the country's routine cycles.

#### 2.6.1 Aggregate Structure: Complex and Scale-Free

The aggregate contentious relations network for 2004-2014 consists of one giant component and 56 small components—most of them separate dyads (figure 2.1). Right away this indicates that most of the contentious relations are somehow connected, which in turn means that there is some coherency to the field of contention. Closer inspection of the giant component shows that there are a few central hubs and several peripheral hubs, all of them connected to a number of vertices with only one degree each. In other words, there are star-like sub-structures of various sizes within the larger structure, and some of the smaller star-like structures appear to be embedded within the local networks of central hubs. These are tell-tale signs of a scale-free network. In addition to the recognition in the literature that scale-free structure is one of the ways networks may be described as “complex,” there is an intuitive sense in which the ability to describe the network as having nested star-like sub-structures indicates complexity.



Figure 2.1. The network contentious relations in Egypt, 2004-2014 (next page.)



With these preliminary descriptions comes the motivation to test whether the network is indeed scale-free by modeling the degree distribution. The degree distribution gives the probability of each degree value in the network based on its frequency across all vertices. In random (Erdős-Rényi) graphs, the degree distribution approximates a Poisson distribution, but in scale-free graphs, it approximates a power-law distribution—a special kind of long-tailed distribution. The easiest way to visualize a power-law distribution is as a linear descending slope on a log-log plot, where in the case of networks the x-axis gives the logarithm of degree values ( $k$ ) and the y-axis gives the logarithm of frequency-based probabilities of degree values ( $Pr(k)$ ) (figure 2.2). Following Clauset, Shalizi, and Newman (2009), because the range of degree values here is not long enough to be considered continuous, a Zeta-normalized power-law distribution of the form

$$Pr(k) \sim \frac{k^{-\gamma}}{\zeta(\gamma, k_{min})}$$

is fit to the tail of the degree distribution of the aggregate network using maximum likelihood estimation, taking the minimum degree value ( $k_{min}$ ) cutoff for the tail that minimized the Kolmogorov-Smirnov statistic.

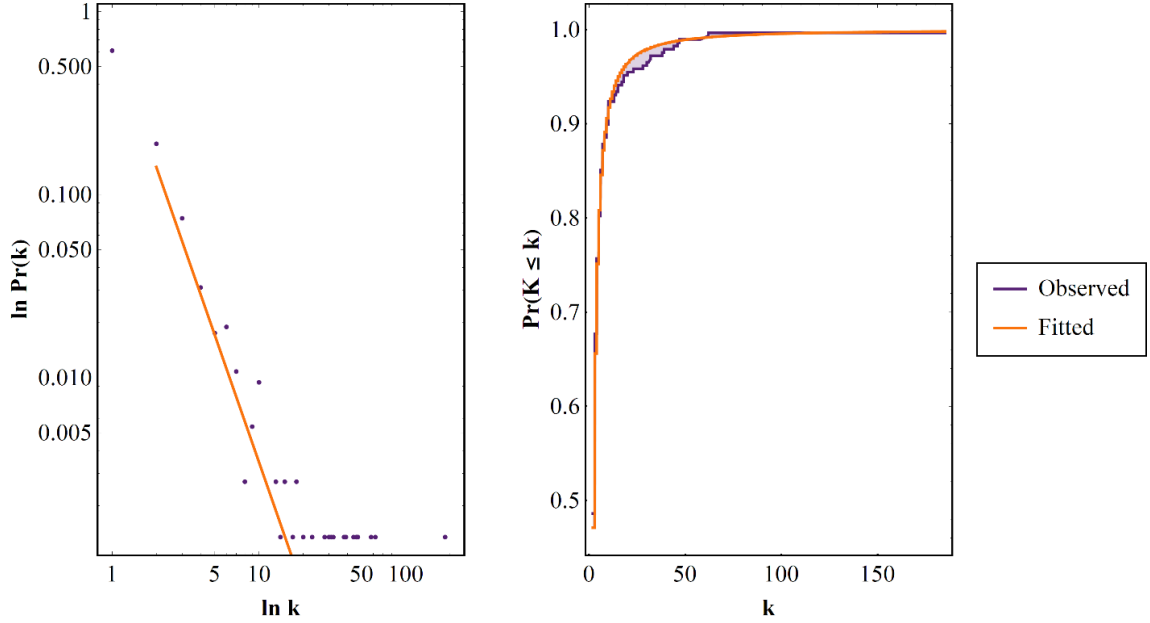


Figure 2.2. Degree distribution for the aggregate contentious relations network (2004-2014) with the best-fitting power-law model ( $\gamma = 2.31$ ;  $k_{min} = 2$ ), plotted in log-log degree probability (left) and the degree cumulative distribution function (right).

The best fit was with an exponent  $\gamma = 2.31$  and a tail cutoff  $k_{min} = 2$ . To assign a p-value and determine the goodness-of-fit of this power-law distribution, the lookup table provided by Goldstein, Morris, and Yen (2004) was used, which produced  $p \geq 0.1$ .<sup>25</sup> Following Clauset, Shalizi, and Newman (2009), this is considered a conservative estimate of statistical significance, but it is not sufficient to conclude the empirical data is most likely power-law-distributed until rival distributions are ruled out. Therefore, logarithmic (the discrete analog of log-normal) and geometric (the discrete analog of exponential) distributions were also fit to the tail of the data, using  $k_{min} = 2$ , maximum likelihood estimation, and Pearson chi-squared tests to estimate goodness-of-fit (table

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<sup>25</sup> Similar results were obtained for networks constructed from all data (1990-2014), the subgraph of the years 2010-2014, and the cumulative graphs ending each year 2010-2014.

2.1). Both logarithmic and geometric distributions were demonstrably poor fits, so the power-law model remains as the best parameterized estimate of the data.

While these tests are sufficient to conclude that the aggregate network is most likely scale-free, they do not provide any direct evidence of preferential attachment as a plausible mechanism for the growth of this network. To do that, one must look into the actual growth of the network. Following Albert and Barabási (2002), the degree values for the same vertices at different times were tracked, correlating prior degree with later increases in degree (normalized by the total increase in edges in the graph). Specifically, cumulative contentious relations were traced from the first observation in 1990 through to various calendar years during the 2004-2014 period (figure 2.3). The data show relatively strong and positive Pearson's correlations between a vertex's degree at one time and its increase in degree at a later time. However, it appears there may in this network be a diminishing correlation over time, which means that there could be variability in the operation of the preferential attachment mechanism left unexplained by the general growth model.

TABLE 2.1.  
BEST-FITTING PARAMETRIC DISTRIBUTIONS  
FOR DEGREE VALUES ( $K_{MIN} = 2$ )  
IN THE CONTENTIOUS RELATIONS NETWORK (2004-2014)

|                          | Power-Law       | Logarithmic            | Geometric               |
|--------------------------|-----------------|------------------------|-------------------------|
| Distribution Parameters  | $\gamma = 2.31$ | $\theta = 0.94$        | $p = 0.15$              |
| Kolmogorov-Smirnov D     | 0.02            | 0.11                   | 0.22                    |
| K-S D p-Value (est.)     | $p \geq 0.1$    | n/a                    | n/a                     |
| Pearson Chi-Squared      | 4.63            | 342.91                 | 535.52                  |
| Pearson $\chi^2$ p-Value | 0.71            | $1.28 \times 10^{-67}$ | $4.14 \times 10^{-106}$ |

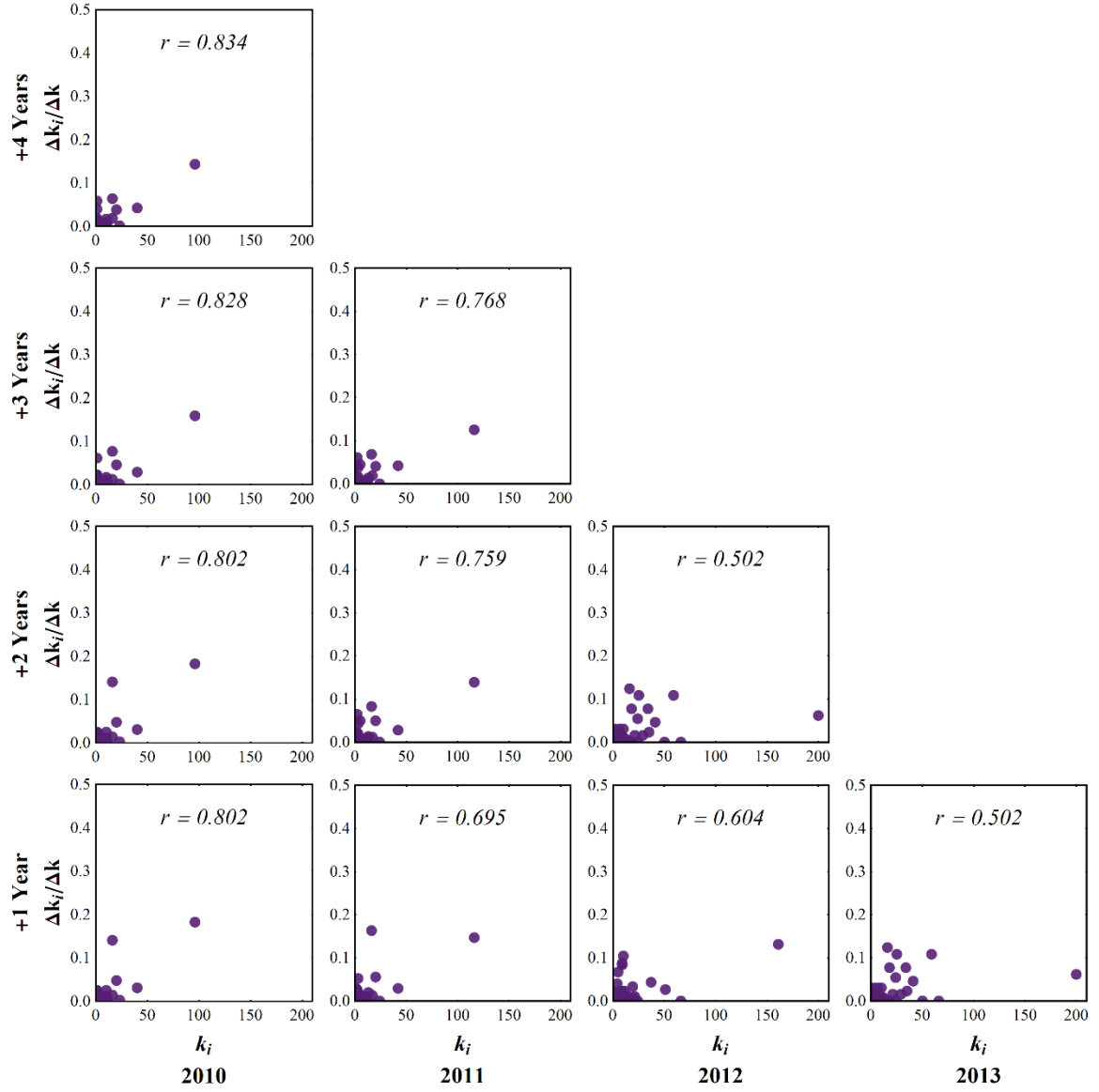


Figure 2.3. Pearson's correlations between degree and later relative increases in degree in cumulative contentious relations networks.

### 2.6.2 Subgraph Structures: Dramatic Increases in Complexity

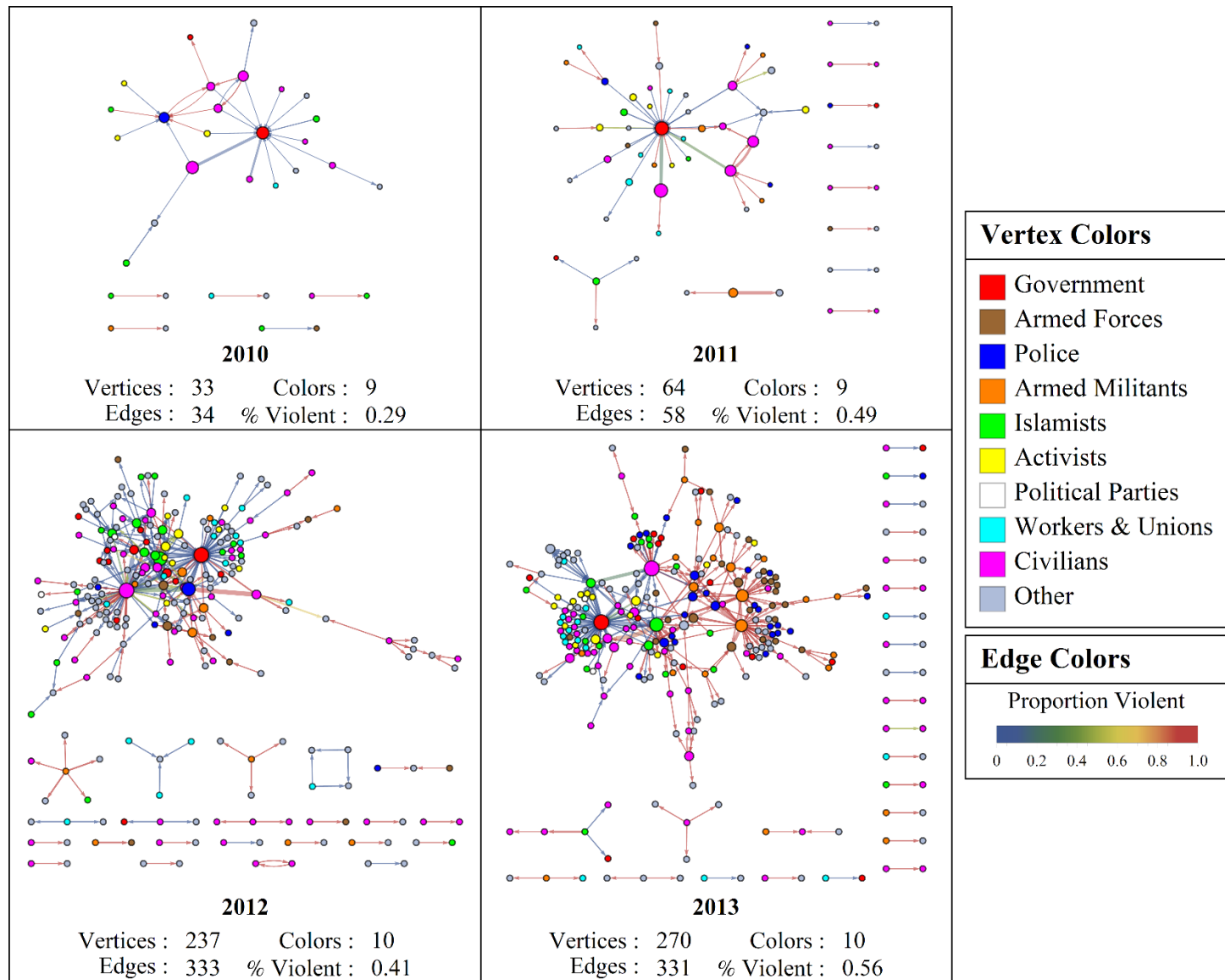
By proceeding from the aggregate network analysis to diagrams of the contentious relations binned by smaller time frames, one can get a closer look at structure before, during, and after the major campaigns of January 25 – February 11, 2011 and June 30 – July 3, 2013.<sup>26</sup> In the first such diagram (figure 2.4), subgraphs for the calendar years 2010, 2011, 2012, and 2013 were extracted—that is, the years of the major campaigns and the years prior. The vertices are labeled only by color to prevent the textual names from cluttering the diagrams, and vertex size reflects relative centrality. By looking at the colors, one sees that government and civilian hubs occupy central positions in all four years—with government vertices strongly tending to be targets and civilians tending to be actors (but also sometimes targets). The 2010 and 2011 networks are simpler than those of 2012 and 2013, based on the raw counts of vertices and edges, as well as the number and interweaving of substructures surrounding the central hubs.

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<sup>26</sup> These campaigns are labeled in various figures below simply as “Jan 25” and “Jun 30.”



Figure 2.4. Contentious relations networks surrounding both major civil resistance campaigns, by year (next page).



Looking at edges, one finds a large increase from 2010 to 2011, and a much more dramatic increase beyond that. Edges have coloration on the basis of predominant tactics: blue hues representing nonviolent, red representing violent, and green-yellow hues representing a mix. Edge width represents weight in terms of dyadic event frequency during the period. The percent-violent value at the bottom of each graph is computed on the total number of events during the year—i.e., the weighted mean of the edge proportions. All graphs have a substantial proportion of violent relations; 2013 the highest. It is also noteworthy that violent edges roughly correspond to a division in the main component in 2013, not surprisingly arrayed around armed militant vertices.

Overall, the clearest indication from these first four subgraphs is that the field became more contentious over time. This dynamic is quantified further by tracking the number of contentious relations over time (figure 2.5). Trends unfold by calendar month, both discretely within a given month (with some blurring on account of inclusion of multi-day events across months), and cumulatively from January 1990 to a given month. Contentious relations are counted by separate events, by unique dyads, and by those dyads in which both vertices are social actors (i.e., excluding symbols, property, and locations). Regardless of how contentious relations are measured, the message is the same: the field became much more contentious after 2011. The inflection point was right at the start of 2012 (at the anniversary of the January 25 campaign, before the elections), and the highest peaks were in late 2012 (when Morsi announced his constitutional reforms) and in mid-2013 (during the June 30 campaign).

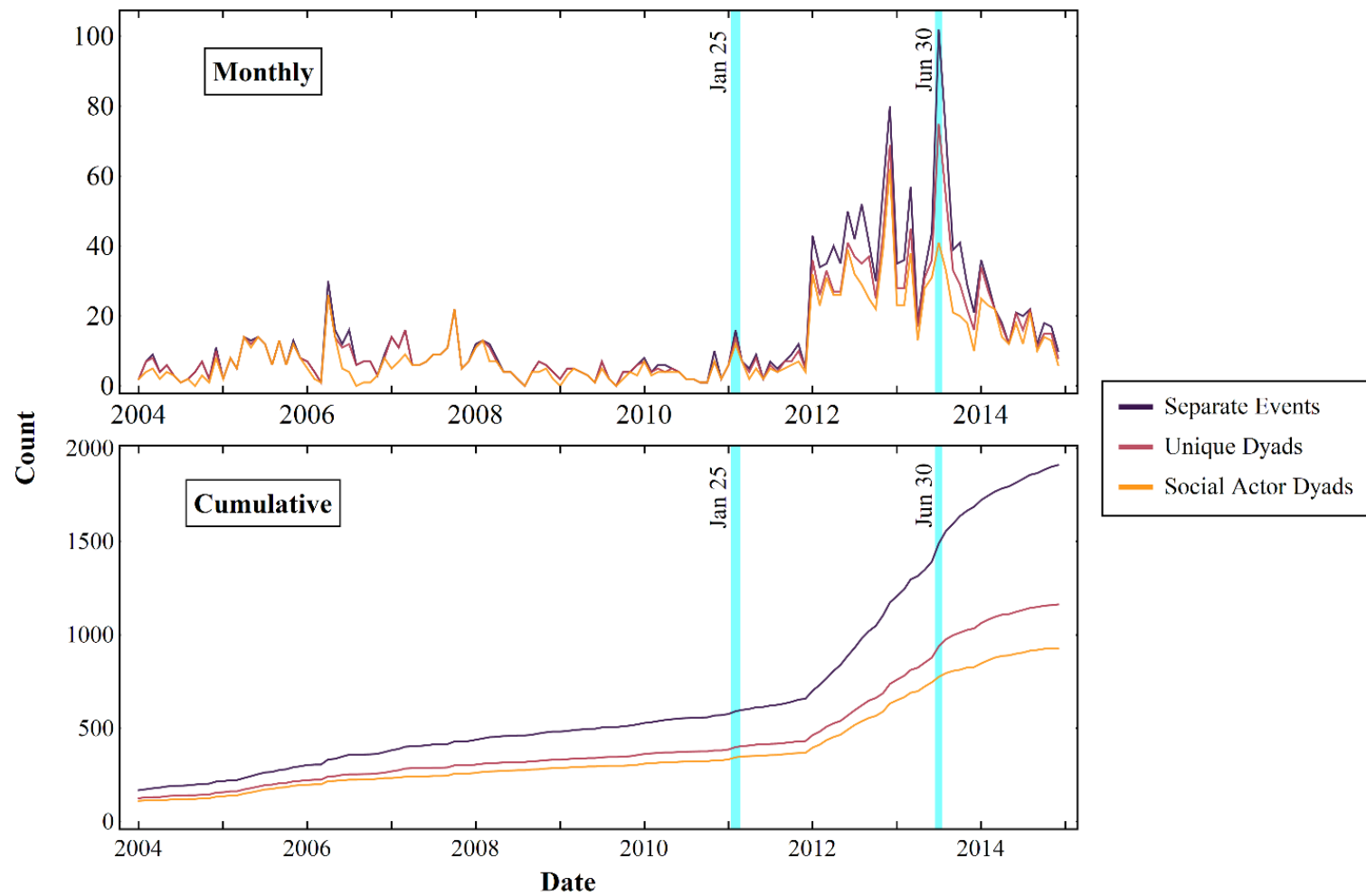


Figure 2.5. Contentious relation counts over time.

Similar trends are evident in monthly (non-cumulative) graph size metrics (figure 2.6). With more contentious relations came more vertices, as well as more independent components. The number of graph elements is summarized in the cyclomatic number (figure 2.7)—which also serves as a baseline metric of network complexity. Interestingly, while the disaggregated element counts show a peak during the June 2013 campaign, the cyclomatic number measured by month peaks in late 2012. This indicates a local maximum of complexity about six months into Morsi’s presidency. It is also noteworthy that baseline complexity had its longest stretch of minimal values surrounding the 2011 uprising. Expectations for all of these cyclomatic number values were modeled using Monte Carlo methods, and yielded no significant anomalies in the monthly graphs, which is not a surprise because this metric is based directly on vertex and edge counts—the parameters used to define congruency between observed and simulated graphs. However, larger graphs have greater potential for variation in cyclomatic number, so expected values are more telling for the cumulative graphs. The monthly peaks in late-2012 and mid-2013 correspond to statistically significantly high values in cyclomatic numbers in the respective cumulative graphs.

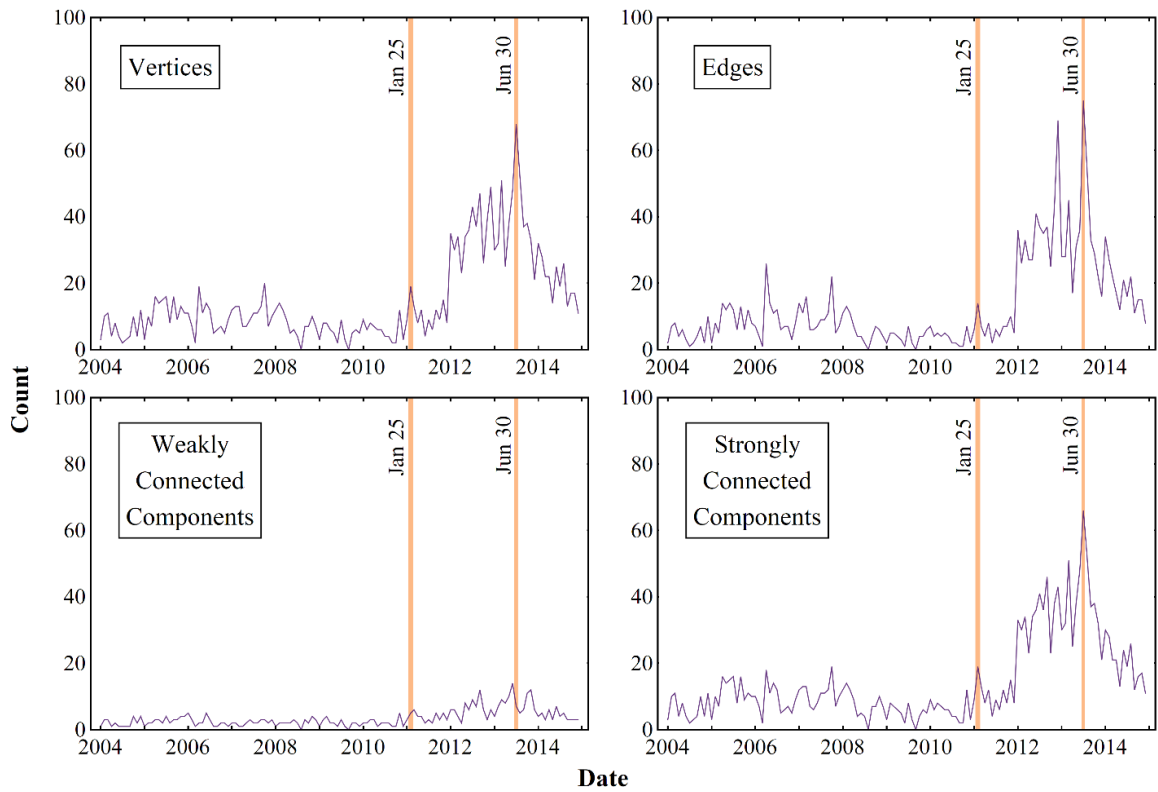


Figure 2.6. Graph elements for contentious relations networks, by month.

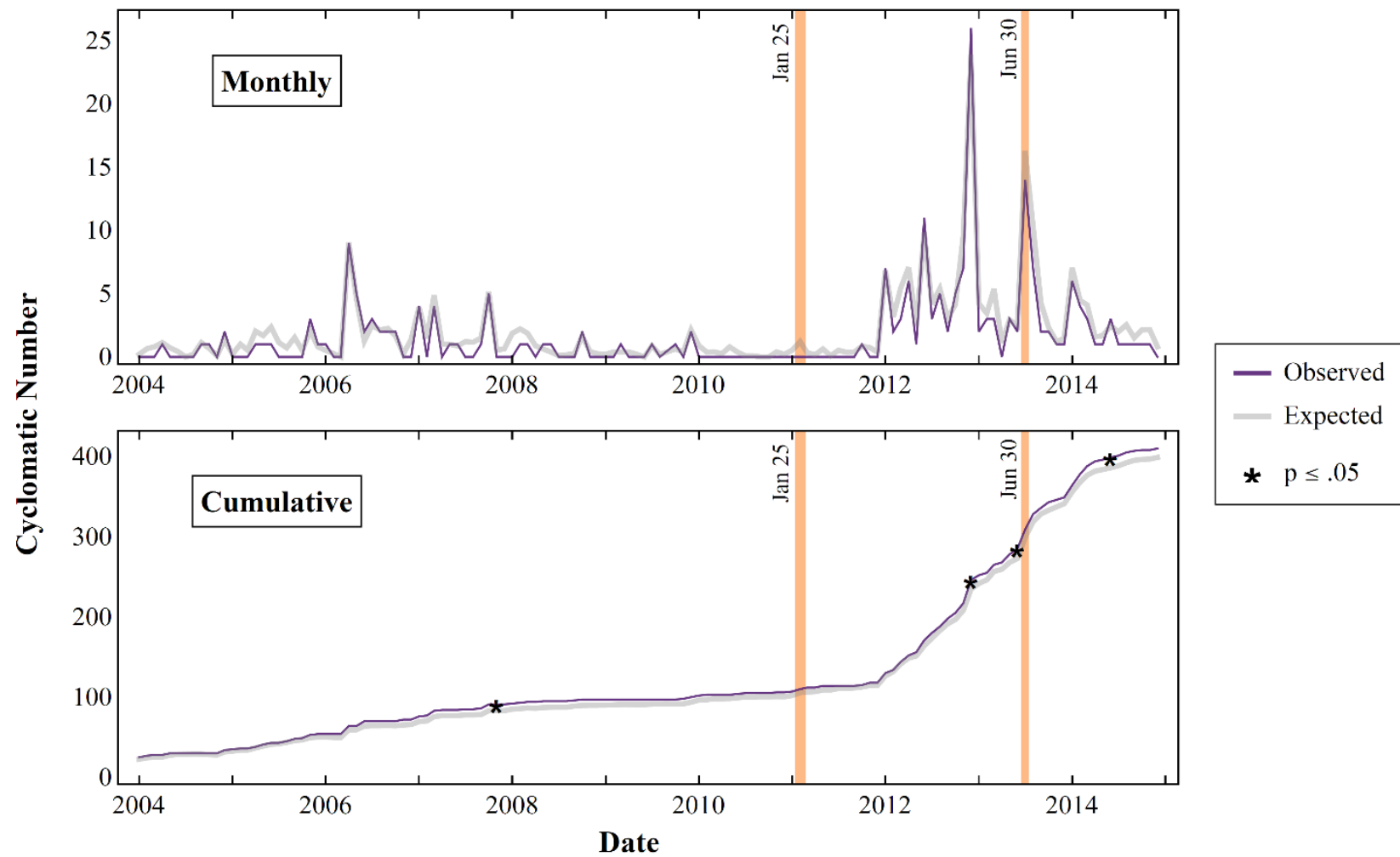


Figure 2.7. Cyclomatic numbers in contentious relations networks over time.

These dynamics in baseline complexity motivate further scrutiny of graph structure. Along with scale-free structure, the other hallmark of complexity in real networks (and unexpected in Erdős-Rényi graphs) is clustering. Clustering is measured in two ways: (1) the global clustering coefficient (using undirected edges; figure 2.8); and (2) average shortest path length (using undirected edges, within the main component only; figure 2.9). Highly clustered graphs, also known as “small worlds,” characteristically have higher than expected clustering coefficient values and lower than expected average shortest path length values. Although scale-free and small-world graphs are often contrasted as two different types of complex networks, it is quite possible for real graphs to transition from one to the other, or to display characteristics of both, as in interconnected hierarchical communities (Albert and Barabási 2002; Girvan and Newman 2002; Li, et al. 2005; Newman and Watts 1999; Newman 2000, 2006).



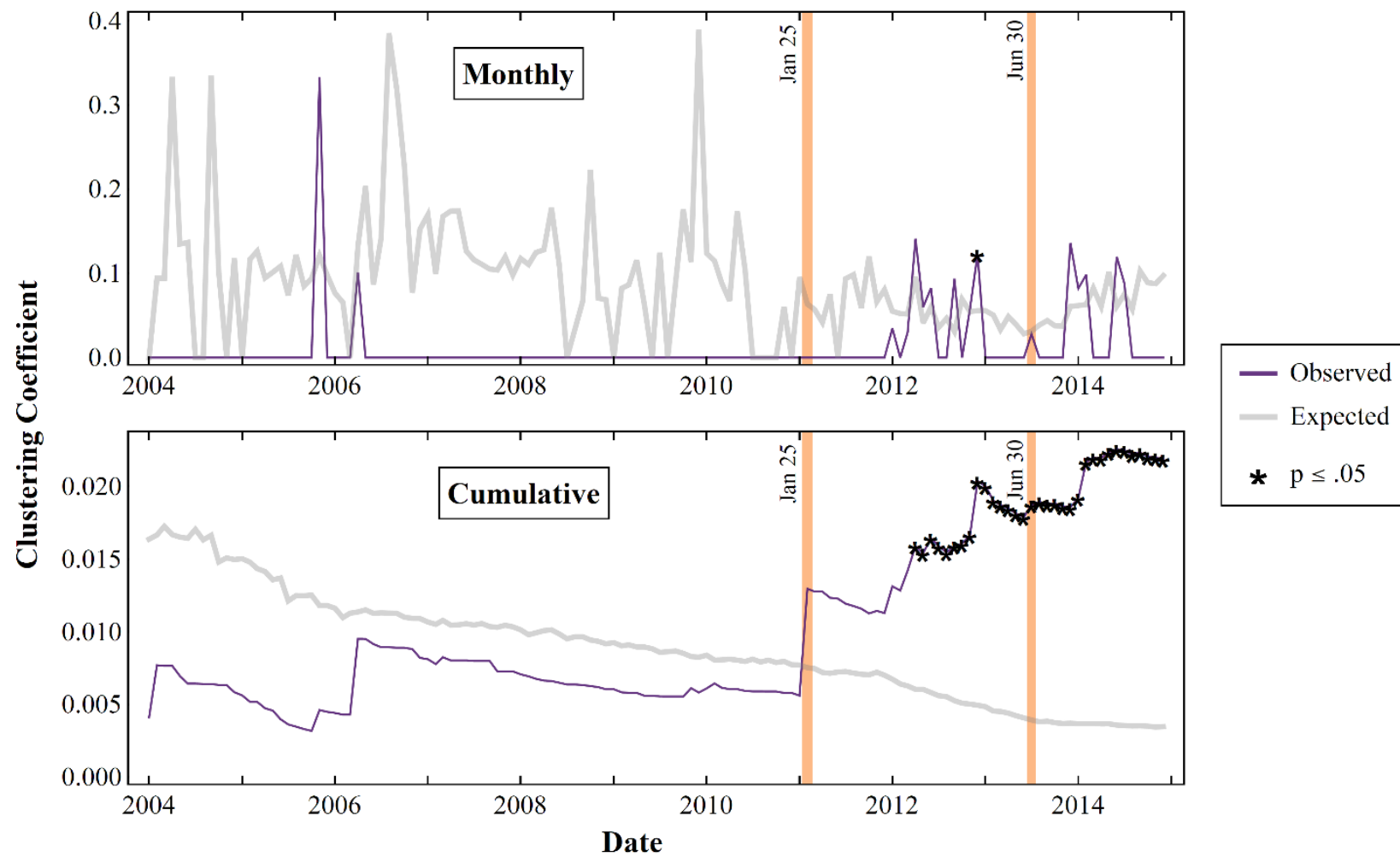


Figure 2.8. Global clustering in contentious relations networks over time.

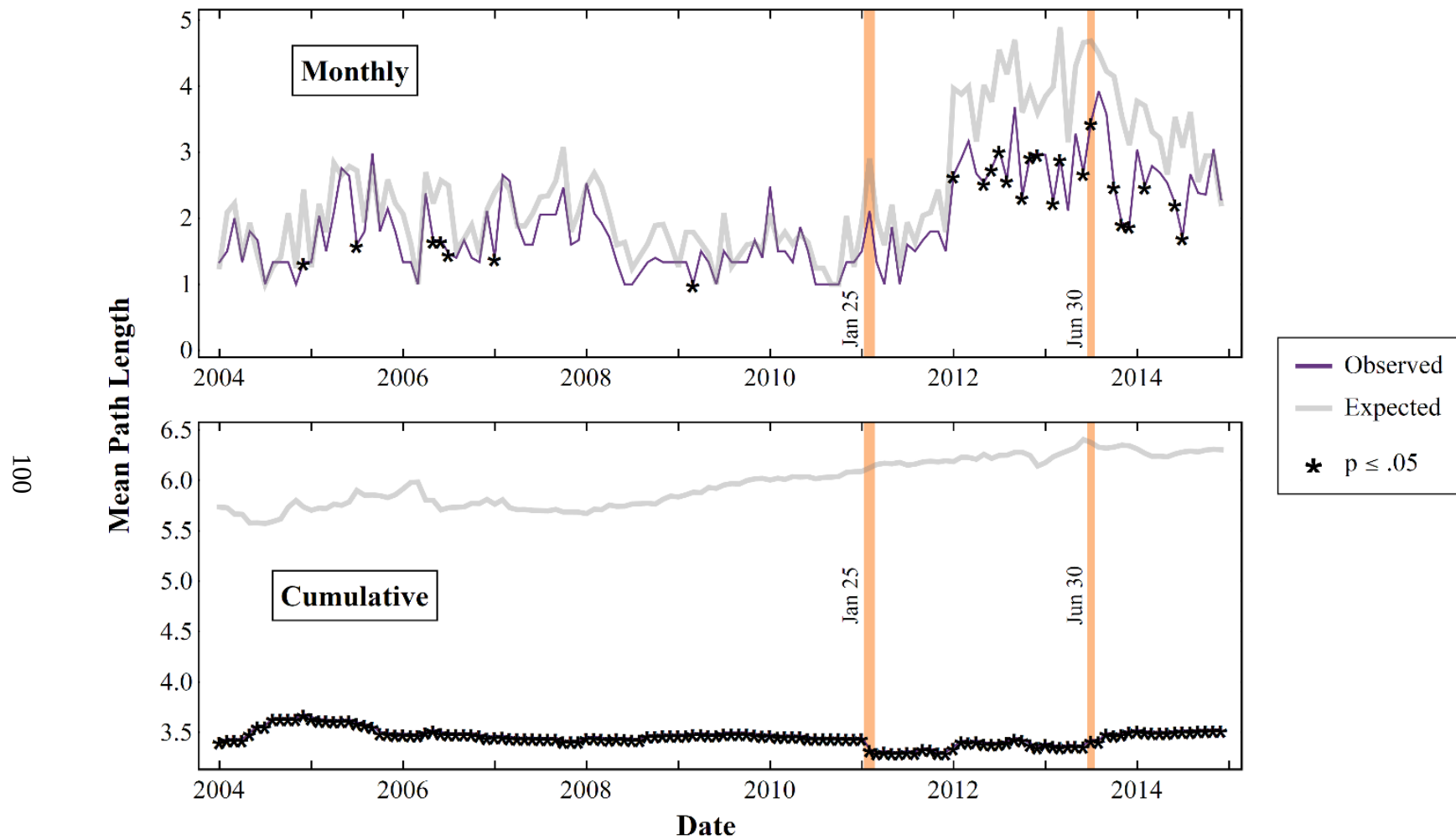


Figure 2.9. Average shortest path lengths in the main components of contentious relations networks over time.

The findings for clustering coefficients in the cumulative network are particularly striking (figure 2.8, bottom). Expected values decline as network size increases, and the observed values do not significantly deviate from the statistical norm in random graphs in the history leading up to the January 2011 campaign. Then the trend suddenly switches. Clustering coefficients cross above the expectation right at the beginning of 2011, and then rise high enough to become statistically significant in early 2012, as the values exceed 0.015. After that, the values keep rising and remain statistically significant. The largest upward movement after the cumulative graphs become significant happens in late 2012, which corresponds to the only monthly graph with a significantly high clustering coefficient. The shift in the evolution of aggregate network indicates that the individually insignificant levels of triadic closure in the monthly subgraphs add up to unprecedented small-worldliness in the Egyptian field of contention after 2011.

The message from dynamics in average shortest path length (in the largest weakly connected components) is somewhat different (figure 2.9). In the cumulative networks, the length values are consistently lower than expected—at about 3.5. Unlike clustering coefficients, average shortest path lengths in monthly networks are significantly lower than expected at several points. But surrounding the January 2011 campaign, path lengths hover between one and two, which aligns with expectations in similarly sized random graphs. The trend of clustering becomes evident in shortest paths as the networks grow overall in 2012, at which point pairs of vertices are on average separated by one or two relations fewer than expected at random.

The final metrics for graph complexity look at degree dynamics oblique to the direct measures of scale-free and small-world structure—namely, decomposed degree

assortativity (figures 2.10 and 2.11).<sup>27</sup> These measurements allow further verification the presence of complex structuring that would be unexpected in random graphs, as well as more precise observation of the nature of complexity in this particular case. Overall, there are unexpectedly low values for in-in, out-out, and out-in assortativity, and unexpectedly high values for in-out assortativity. In other words, the trends are that frequent targets tend to act against frequent actors, while frequent targets tend not to act against other frequent targets, frequent actors tend not to act against other frequent actors, and frequent actors tend not to act against frequent targets. There is, however, a gap in the statistical significance of out-out disassortativity near the span of the two major campaigns, which is explained by a flip to higher likelihood of frequent actors targeting other frequent actors in the narrower (moving three-month) graphs during the same period. In addition, there are some noteworthy trendline changes for in-out and out-in assortativity. In-out assortativity trended downward starting just before 2011 and continuing through 2012, after which it started to pick back up. Meanwhile, out-in assortativity started trending downward in 2012, whereas previously it had swung across the origin several times. Neither of these trend movements amounted to sign switched in the cumulative networks, but the downward trend in out-in assortativity corresponds with a concomitant trend in the moving three-month graphs from 2012 onward. Considered together, the decomposed assortativity dynamics give a clearer picture of what was happening within the degree distribution as clustering coefficients rose and became significant.

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<sup>27</sup> Assortativity is plotted by three-month windows moving in one-month increments because the discrete monthly data for the assortativity measures was much noisier. This smoothing does not change the substantive findings.

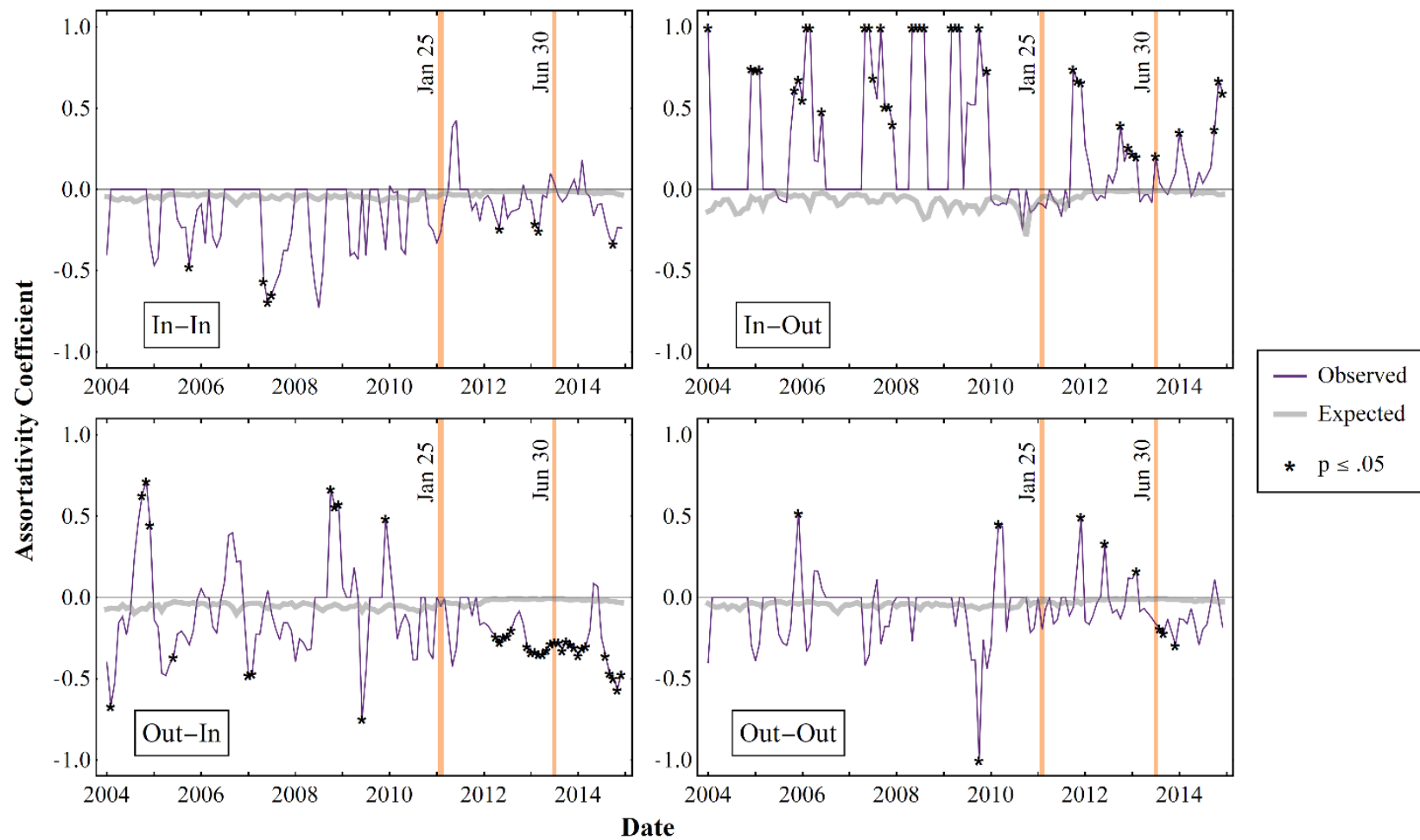


Figure 2.10. Decomposed degree assortativity for contentious relations networks, by 3-month moving window.

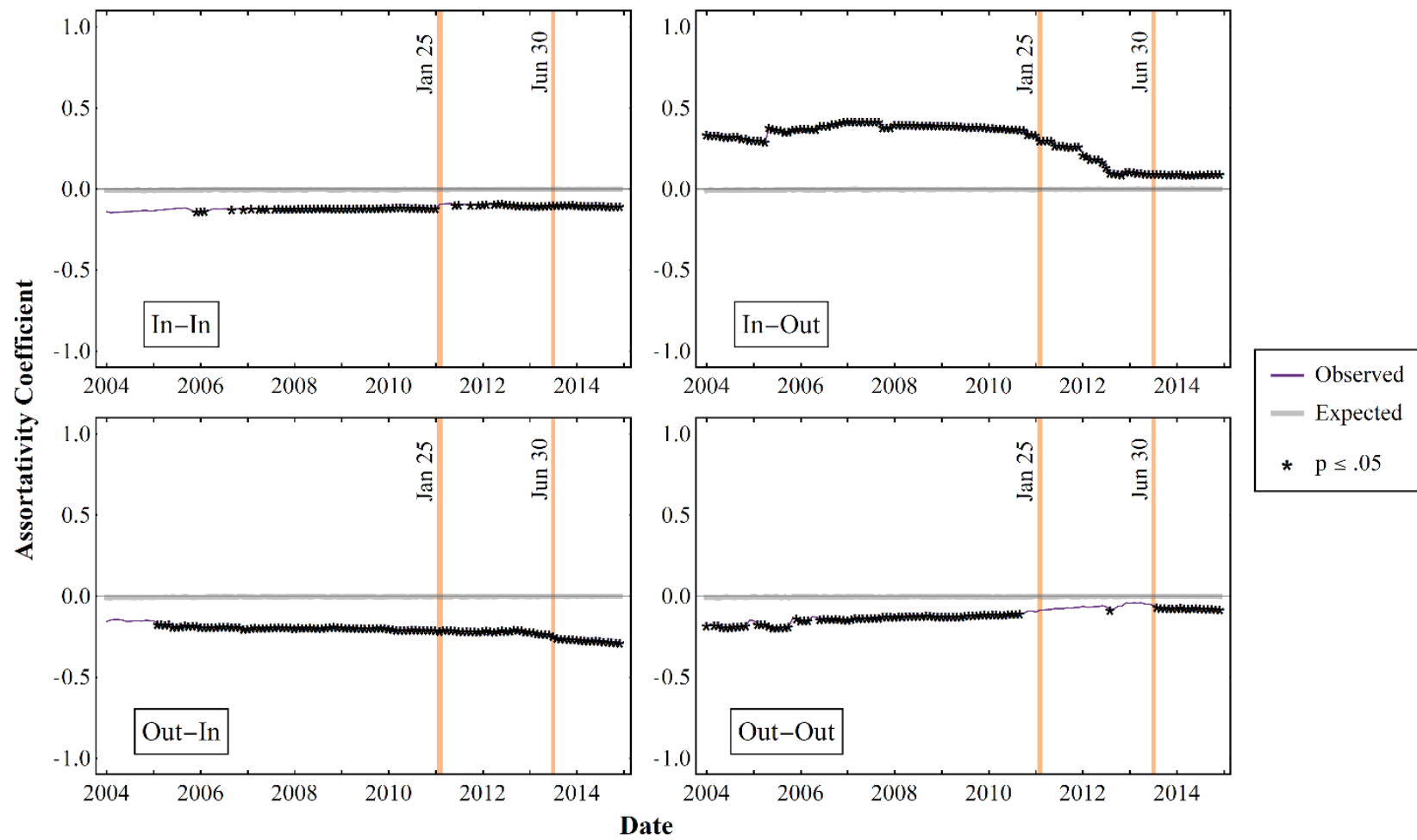


Figure 2.11. Evolution of decomposed degree assortativity in the cumulative contentious relations network.

### 2.6.3 Substantive Features: Segmentation by Identity and Tactics

Now that the case for complexity has been made with thorough specificity, the substantive features of the subgraphs take the foreground. As a reminder, the goal is to see how known attributes of vertices and edges overlay network structure, which serves the purpose of surveying the landscape of contention in Egypt and completing this portion of the study of the context surrounding the major civil resistance campaigns of January 25 – February 11, 2011 and June 30 – July 3, 2013.

For vertex attributes, ten mutually exclusive categorical labels relevant to the case are examined: civilians; activists; workers and unions; Islamists; political parties; government; police; armed forces; armed militants; and other (i.e., not otherwise classified). Recall that the identification of vertices comes relatively unaltered from SCAD. Recall also that a Simmelian-relational theoretical framework rejects a fixed ontology of social life, such that identification of entities is always considered relative to their relations. Thus, the fact that some vertex identifications, such as “Citizens, Egyptian,” could be construed as categories inclusive of many other vertices is not cause to subsume some vertices within others. In the network diagrams, each vertex is plotted separately according to its identification in SCAD. The only categorization used is the ten colors, and when vertices are reduced by color, it is not asserted that any entity has an equivalence or part-whole relation with any other. In proceeding to discuss individual vertices and categories thereof, it is vital to remember that all entities are relative to relations, and that relations in turn are here manifested in specific contentious events. So as much as the analyses in this subsection are less abstract than those of the previous

subsection, they are nevertheless not so concrete as to impose a timeless ontology for all individual and collective actors in the Egyptian field of contention.

For edge attributes, the focus is on a dichotomy in the predominant tactics employed within the contentious events underlying each (weighted) edge in the networks: violent or nonviolent. There are, of course, many other features of these network elements (and the phenomena they represent) that are worth analyzing. And yet, there is more than enough to absorb from these attributes alone. Summarizing in advance, there are two main points. First, between the 2011 and the 2013 campaigns, the network shifted from multifaceted opposition to the central government to segmentation by vertex categories. Second, the proportion of violence trended downward after the 2011 but upward after the 2013 campaign, as a pronounced violent periphery developed in the network.

These claims are supported with data presented in network diagrams, tables of vertex metrics, weighted adjacency matrices reduced by vertex color, and plots of trends in violent/nonviolent tactics. Before highlighting and interpreting the substantiating evidence given in these data visualizations, there are a few points of clarification to make.

The network diagrams are induced from either monthly graphs (figure 2.12) or 3-week moving graphs (figures 2.13 and 2.14). Each vertex represents a distinct entity, the names of which are left unlabeled to reduce visual clutter. Instead, vertices are labeled only by their categories, and notable vertex names are reported separately, along with their degree-based attributes, in tables 2.2 and 2.3. Vertex size and placement on the plane in the network diagrams is determined by relative degree centrality. Edge thickness represents relative weight, and edge color represents the proportion of underlying events



that were violent. The labels at the bottom of each diagram also report the percentage of all events during a given time window that were violent. The diagrams that are contiguous in time, as specified by their labels, show all edges and vertices from the union of all contiguous time windows in the same positions, with those of the current time period given in bold color and those from other periods in the union thinned and grayed. This is meant to aid in the visual inspection of the similarities and differences over time.

To show relations within and among entity categories, weighted adjacency matrices are presented for subgraphs in yearly (figure 2.15), monthly (figure 2.16), and 3-week moving (figures 2.17 and 2.18) windows. The ten categories are given as rows and columns, so that cells represent the presence of directed edges from the row label to the column label. The color saturation within cells represents edge weight, scaled according to the maximum event count for any edge during the period. These weighted adjacency matrices thus effectively report the level and specific type of assortative mixing by vertex color.

Figure 2.12. Contentious relations networks surrounding both major civil resistance campaigns, by month (next page).

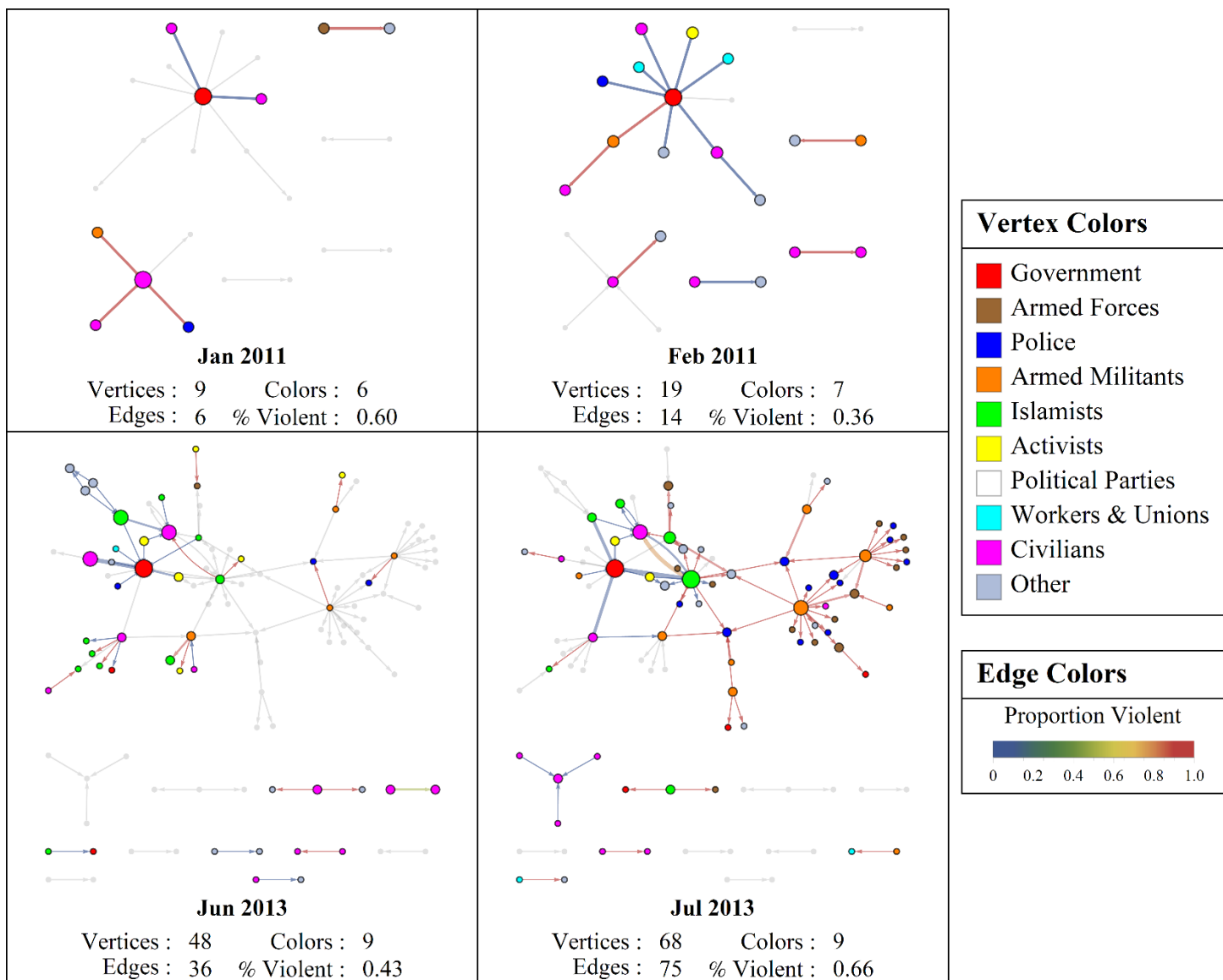


Figure 2.13. Contentious relations networks surrounding the January 2011 campaign,  
by 3-week moving window (next page).

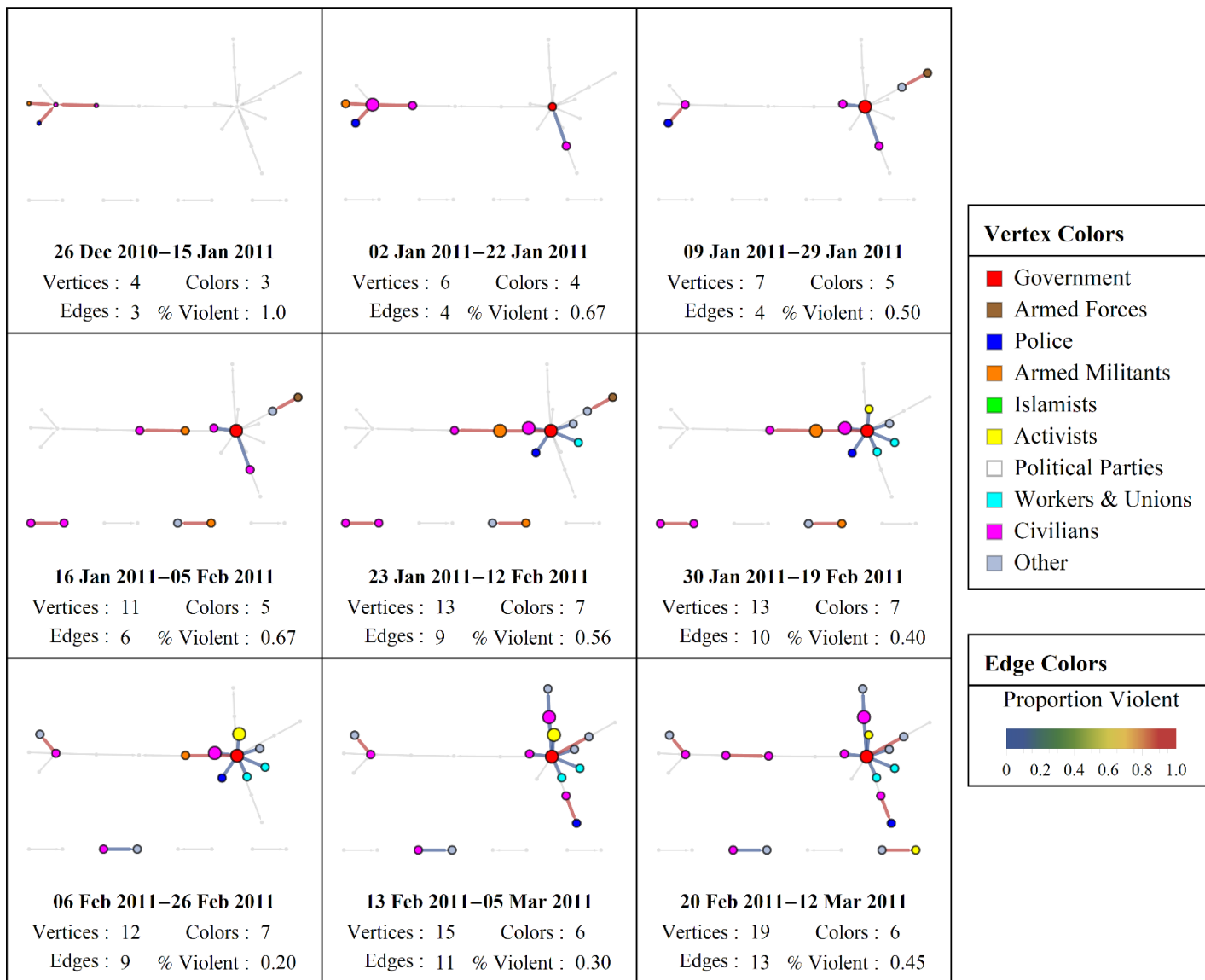
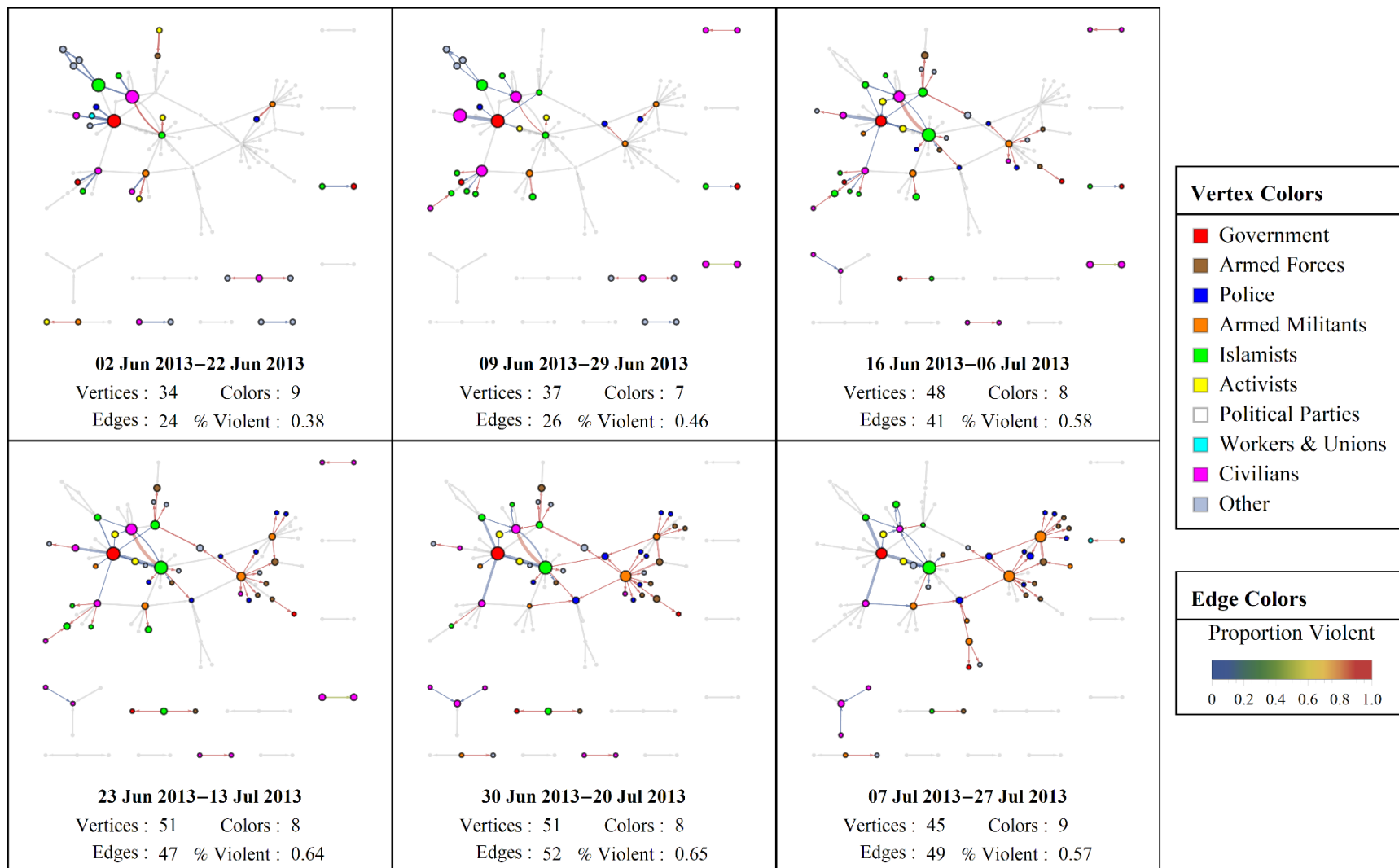


Figure 2.14. Contentious relations networks surrounding the June 2013 campaign,  
by 3-week moving window (next page).



With these preface points now made, examination of the monthly and 3-week network diagrams sets the stage (figures 2.12-14). As with the yearly subgraphs above (figure 2.4), visual inspection illuminates the contrasts in graph complexity between the two major campaigns. It is easy to see that more information is contained in the graphs during the 2013 uprising than in those of the 2011 uprising. One notes the presence of closed triads in the later networks, while the earlier networks had none whatsoever: this represents the difference in clustering. With narrower time windows, it is now easier to see the change from one primary star motif, with the government as the in-degree hub (a “sink” in network terminology; an out-degree hub is called a “source”), to multiple star-like motifs centered around different sinks and sources. In the months and weeks surrounding the 2013 campaign, the government was again the main sink, but there were also many events specifically targeting Egyptian police and armed forces—most of these actions initiated by armed militants using violent tactics. These observations are elaborated and quantified in tables 2.2 and 2.3: armed militants were much more active, and various organs of the Egyptian security forces were singled out for attack much more frequently around the 2013 campaign.



TABLE 2.2.

NOTABLE ENTITIES IN THE CONTENTIOUS RELATIONS NETWORK,  
SORTED BY DEGREE CENTRALITY

| Entity                            | Category        | Degree<br>2004-<br>2014 | In-Deg<br>Jan-Feb<br>2011 | Out-Deg<br>Jan-Feb<br>2011 | In-Deg<br>Jun-Jul<br>2013 | Out-Deg<br>Jun-Jul<br>2013 |
|-----------------------------------|-----------------|-------------------------|---------------------------|----------------------------|---------------------------|----------------------------|
| Government, Egypt                 | Government      | 185                     | 9                         | 0                          | 11                        | 0                          |
| Police, Egypt                     | Police          | 62                      | 0                         | 1                          | 0                         | 1                          |
| Citizens, Egyptian                | Civilians       | 58                      | 0                         | 0                          | 0                         | 0                          |
| Muslim Brotherhood                | Islamists       | 47                      | 0                         | 0                          | 2                         | 2                          |
| Armed Men                         | Armed Militants | 46                      | 0                         | 0                          | 0                         | 15                         |
| Supporters,<br>Mohamed Morsi      | Islamists       | 44                      | 0                         | 0                          | 3                         | 13                         |
| Militants                         | Armed Militants | 39                      | 0                         | 0                          | 0                         | 11                         |
| Protesters                        | Civilians       | 38                      | 0                         | 1                          | 0                         | 7                          |
| Armed Assailants                  | Armed Militants | 32                      | 0                         | 0                          | 2                         | 4                          |
| Islamists                         | Islamists       | 31                      | 0                         | 0                          | 0                         | 6                          |
| Security Forces,<br>Egypt         | Armed Forces    | 30                      | 0                         | 0                          | 2                         | 0                          |
| Armed Forces, Egypt               | Armed Forces    | 28                      | 0                         | 0                          | 1                         | 1                          |
| Christians, Coptic                | Civilians       | 20                      | 3                         | 1                          | 0                         | 1                          |
| Opponents,<br>Mohamed Morsi       | Civilians       | 18                      | 0                         | 0                          | 6                         | 2                          |
| Armed Attackers                   | Armed Militants | 15                      | 0                         | 2                          | 0                         | 3                          |
| Muslims                           | Civilians       | 15                      | 0                         | 1                          | 0                         | 0                          |
| Supporters, Muslim<br>Brotherhood | Islamists       | 13                      | 0                         | 0                          | 0                         | 1                          |
| Activists, Secular                | Activists       | 10                      | 0                         | 0                          | 0                         | 0                          |
| Kefaya                            | Activists       | 10                      | 0                         | 0                          | 0                         | 0                          |
| Christians                        | Civilians       | 10                      | 1                         | 0                          | 1                         | 0                          |
| Police Officers,<br>Egyptian-Male | Police          | 9                       | 0                         | 0                          | 1                         | 0                          |
| Station, Police-Egypt             | Police          | 9                       | 0                         | 0                          | 5                         | 0                          |
| Prisoners                         | Other           | 8                       | 1                         | 0                          | 0                         | 0                          |
| Soldiers, Egyptian                | Armed Forces    | 7                       | 0                         | 1                          | 1                         | 0                          |
| April 6 Youth<br>Movement         | Activists       | 7                       | 0                         | 0                          | 0                         | 0                          |
| Militants, Islamic                | Armed Militants | 7                       | 0                         | 0                          | 0                         | 1                          |
| Villagers                         | Civilians       | 7                       | 0                         | 2                          | 0                         | 2                          |

TABLE 2.3.

NOTABLE ENTITIES IN THE CONTENTIOUS RELATIONS NETWORK AND  
PERCENTAGES OF DEGREE VALUES CONSISTING OF VIOLENT RELATIONS

| Entity                            | Category           | Degree<br>2004-<br>2014<br>%Violent | In-Deg<br>Jan-Feb<br>2011<br>%Violent | Out-Deg<br>Jan-Feb<br>2011<br>%Violent | In-Deg<br>Jun-Jul<br>2013<br>%Violent | Out-Deg<br>Jun-Jul<br>2013<br>%Violent |
|-----------------------------------|--------------------|-------------------------------------|---------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|
| Government, Egypt                 | Government         | 10.81                               | 9.09                                  | -                                      | 0                                     | -                                      |
| Police, Egypt                     | Police             | 67.97                               | -                                     | 0                                      | -                                     | -                                      |
| Citizens, Egyptian                | Civilians          | 20.21                               | -                                     | -                                      | -                                     | -                                      |
| Muslim Brotherhood                | Islamists          | 8.85                                | -                                     | -                                      | 0                                     | 0                                      |
| Armed Men                         | Armed<br>Militants | 100                                 | -                                     | -                                      | -                                     | 100                                    |
| Supporters,<br>Mohamed Morsi      | Islamists          | 31.82                               | -                                     | -                                      | 25.0                                  | 46.43                                  |
| Militants                         | Armed<br>Militants | 100                                 | -                                     | -                                      | -                                     | 100                                    |
| Protesters                        | Civilians          | 34.12                               | -                                     | 0                                      | -                                     | 20.0                                   |
| Armed Assailants                  | Armed<br>Militants | 95.65                               | -                                     | -                                      | 0                                     | 100                                    |
| Islamists                         | Islamists          | 41.67                               | -                                     | -                                      | -                                     | 100                                    |
| Security Forces,<br>Egypt         | Armed Forces       | 56.82                               | -                                     | -                                      | 100                                   | -                                      |
| Armed Forces, Egypt               | Armed Forces       | 57.89                               | -                                     | -                                      | 100                                   | 100                                    |
| Christians, Coptic                | Civilians          | 68.52                               | 100                                   | 100                                    | -                                     | -                                      |
| Opponents,<br>Mohamed Morsi       | Civilians          | 35.71                               | -                                     | -                                      | 56.25                                 | 0                                      |
| Armed Attackers                   | Armed<br>Militants | 100                                 | -                                     | 100                                    | -                                     | 100                                    |
| Muslims                           | Civilians          | 76.47                               | -                                     | 100                                    | -                                     | -                                      |
| Supporters, Muslim<br>Brotherhood | Islamists          | 31.25                               | -                                     | -                                      | -                                     | -                                      |
| Activists, Secular                | Activists          | 6.25                                | -                                     | -                                      | -                                     | -                                      |
| Kefaya                            | Activists          | 4.35                                | -                                     | -                                      | -                                     | -                                      |
| Christians                        | Civilians          | 77.78                               | 100                                   | -                                      | 100                                   | -                                      |
| Police Officers,<br>Egyptian-Male | Police             | 78.57                               | -                                     | -                                      | 100                                   | -                                      |
| Station, Police-Egypt             | Police             | 86.67                               | -                                     | -                                      | 100                                   | -                                      |
| Prisoners                         | Other              | 70.0                                | 100                                   | -                                      | -                                     | -                                      |
| Soldiers, Egyptian                | Armed Forces       | 100                                 | -                                     | 100                                    | 100                                   | -                                      |
| April 6 Youth<br>Movement         | Activists          | 9.09                                | -                                     | -                                      | -                                     | -                                      |
| Militants, Islamic                | Armed<br>Militants | 100                                 | -                                     | -                                      | -                                     | 100                                    |
| Villagers                         | Civilians          | 71.43                               | -                                     | 0                                      | -                                     | -                                      |

Understanding that edges represent contentious events, it should be noted that an increase of events after 2011 could have resulted in higher weights within existing edges. Yet in fact, later contentious events took place in differentiated relations. That the relations were differentiated is meaningful, for it demonstrates whether and how a quantitative increase in contentious events reflects qualitative changes in contentious relationality within the field. In the present case, a number of contentious relations recurred, but the structure of the field changed as new acts of contention occurred among more relationally differentiated entities than before. How exactly more relations among more differentiated entities concatenated matters, too. The star motif from 2011 could have simply gained more points. Or if more stars emerged, they could have chained together along a tree-like structure. But that is not what happened here. Instead, as more star-like motifs formed, they were interlinked by closed triads and other looping pathways. In addition, the hubs at the center of the star-like motifs diversified by entity category and polarized the main connected component by edge type. As figures 2.13 and 2.14 show, both civil resistance campaigns coincided with relative increases in violent relations (see also figures 2.19 and 2.20). Whereas these violent relations did not fundamentally alter the structure of the network in 2011, they transformed the network from a cluster of government, civilians, and Islamists immediately before the 2013 campaign to a wider web with armed militant hubs on one side, government and civilians on the other side, and Islamists in-between immediately after the 2013 campaign. It is also noteworthy that the contentious divisions between Islamists and liberal/secular activists recounted in Chapter 1 are evident in the graphs (figures 2.12 and 2.14).

Examination of the weighted adjacency matrices sheds more light on the diversification and segmentation among vertices by color. Starting with yearly subgraphs, figure 2.15 clearly shows that civilian entities were the primary actors and government entities the primary targets in 2011. Civilian entities remained primary actors through 2012, but their targets were spread across categories—although still mostly government targets. By 2013, Islamists and armed militants became proportionately more frequent actors, with stronger targeting beyond the government-as-such to the armed forces and police. The swing continued into 2014, as contention originated mainly from armed militants and Islamists, while activists and other civilians faded.

Zooming in to the relational patterns immediately surrounding the civil resistance campaigns, figures 2.16-18 underscore the point. During the 2011 campaign, the field as a whole reflected the relationality of that campaign: various segments of the society aligned against government entities. The context surrounding the 2013 campaign, by contrast, ran counter and oblique to a people-power motif. The contentious action was diversified across entity categories, and in the mix, undifferentiated civilians were at odds with Islamists. These observations from the weighted adjacency matrices support and fill in the findings about complexity. The more cells populated in the matrices, the more substantive information the graphs contain. When reduction by vertex color leaves just a few rows or columns populated, then the graph is effectivity simplified by naming the columns. Therefore, the more rows and columns are populated, the more complex the graph. The abstract structural differences in complexity between the two campaigns map to concrete differences in complexity as well.

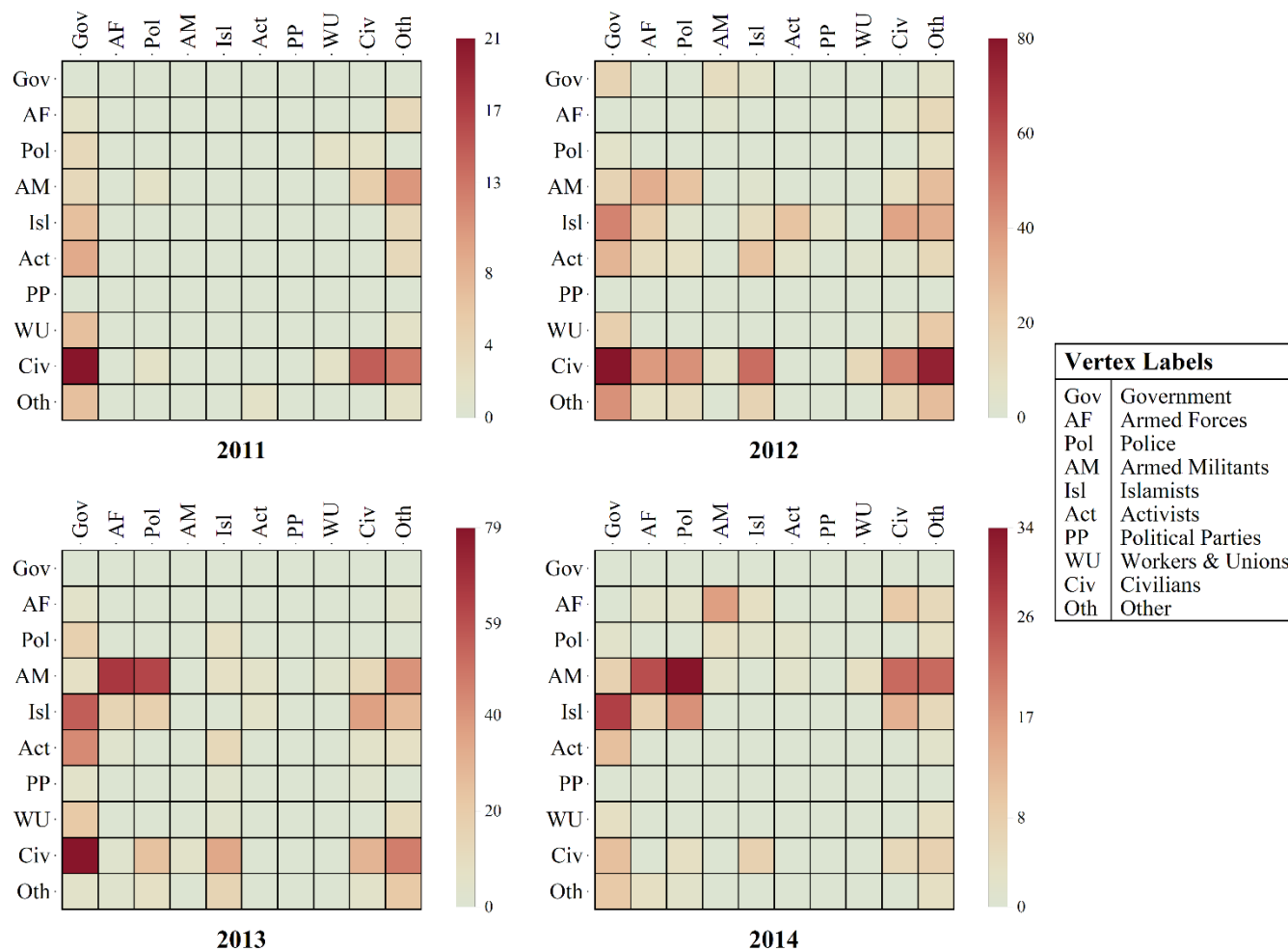


Figure 2.15. Weighted adjacency matrices for contentious relations among categorized vertices surrounding both major campaigns, by year.

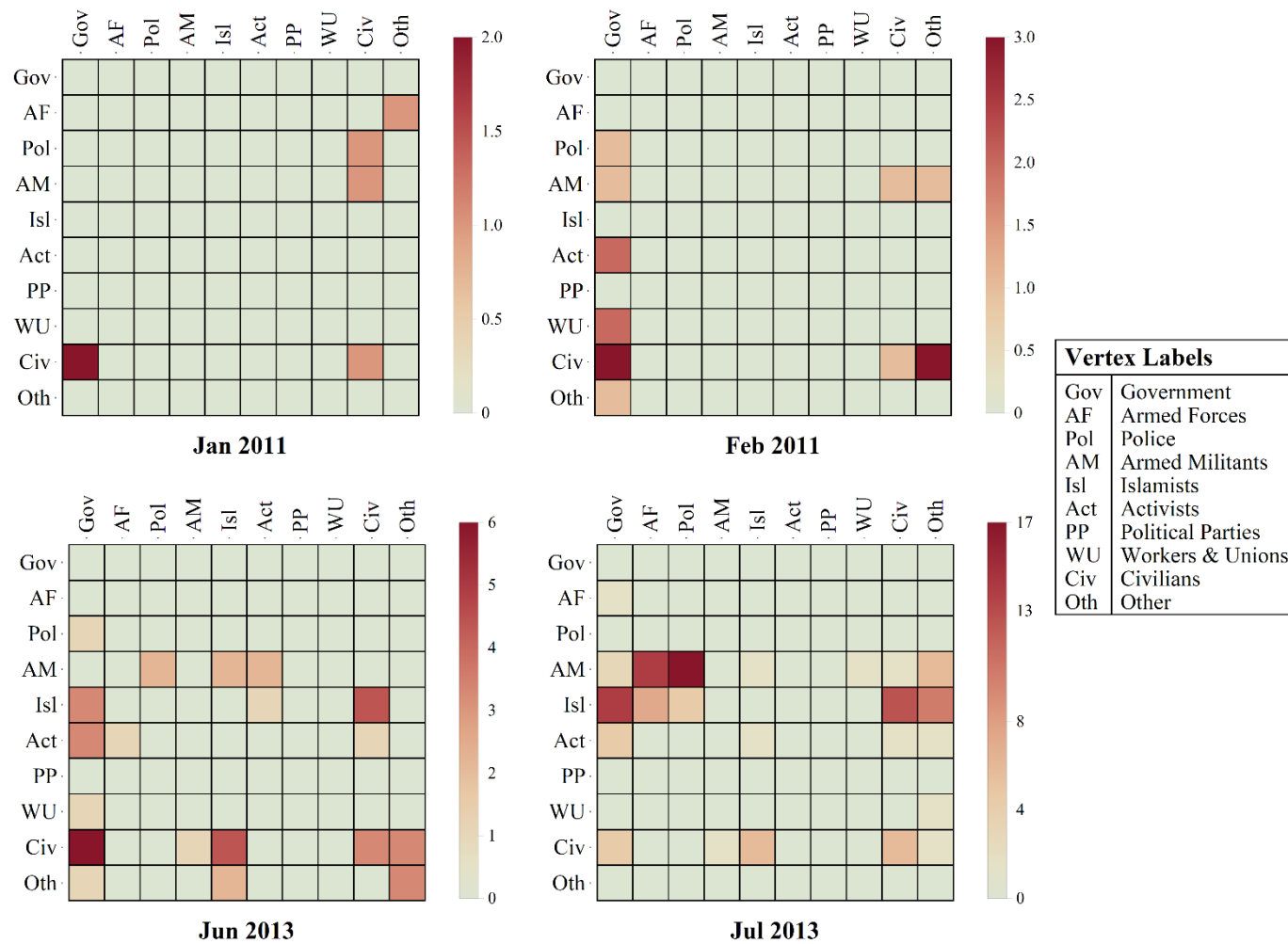
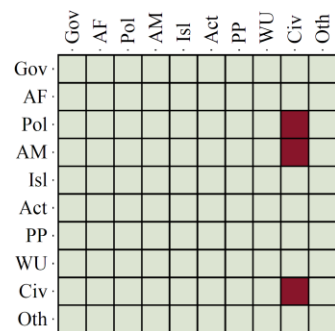
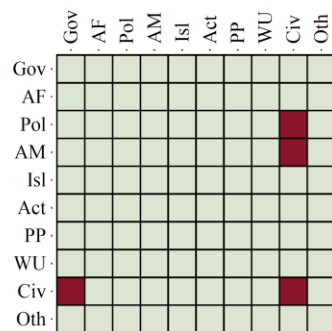


Figure 2.16. Weighted adjacency matrices for contentious relations among categorized vertices surrounding both major campaigns, by month.

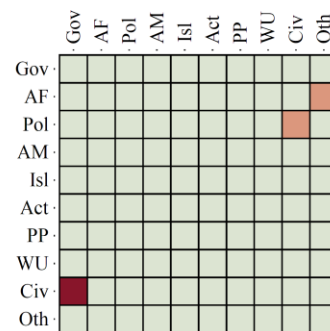
Figure 2.17. Weighted adjacency matrices for contentious relations among categorized vertices surrounding the January 2011 campaign, by 3-week moving window (next page).



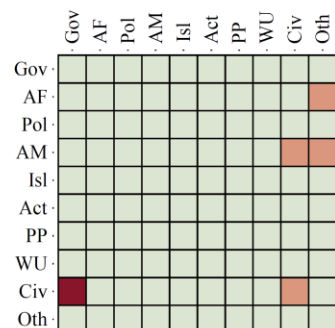
26 Dec 2010–15 Jan 2011



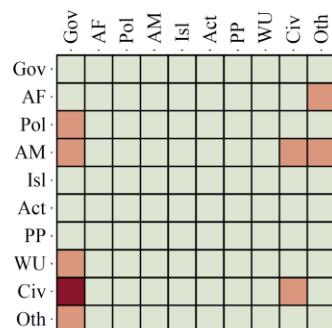
02 Jan 2011–22 Jan 2011



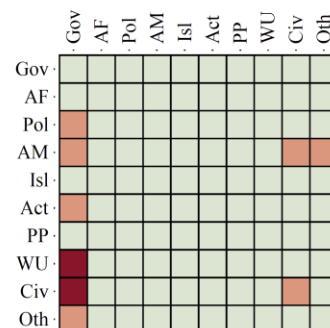
09 Jan 2011–29 Jan 2011



16 Jan 2011–05 Feb 2011

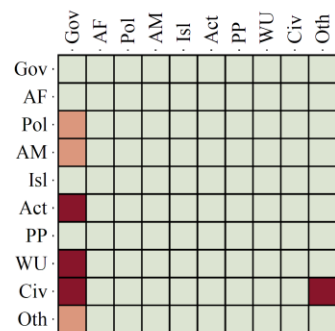


23 Jan 2011–12 Feb 2011

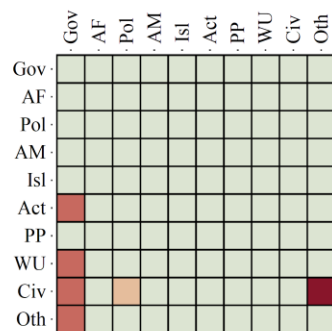


30 Jan 2011–19 Feb 2011

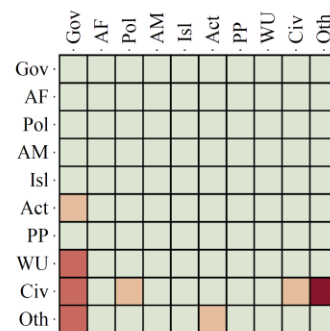
| Vertex Labels |                   |
|---------------|-------------------|
| Gov           | Government        |
| AF            | Armed Forces      |
| Pol           | Police            |
| AM            | Armed Militants   |
| Isl           | Islamists         |
| Act           | Activists         |
| PP            | Political Parties |
| WU            | Workers & Unions  |
| Civ           | Civilians         |
| Oth           | Other             |



06 Feb 2011–26 Feb 2011



13 Feb 2011–05 Mar 2011



20 Feb 2011–12 Mar 2011



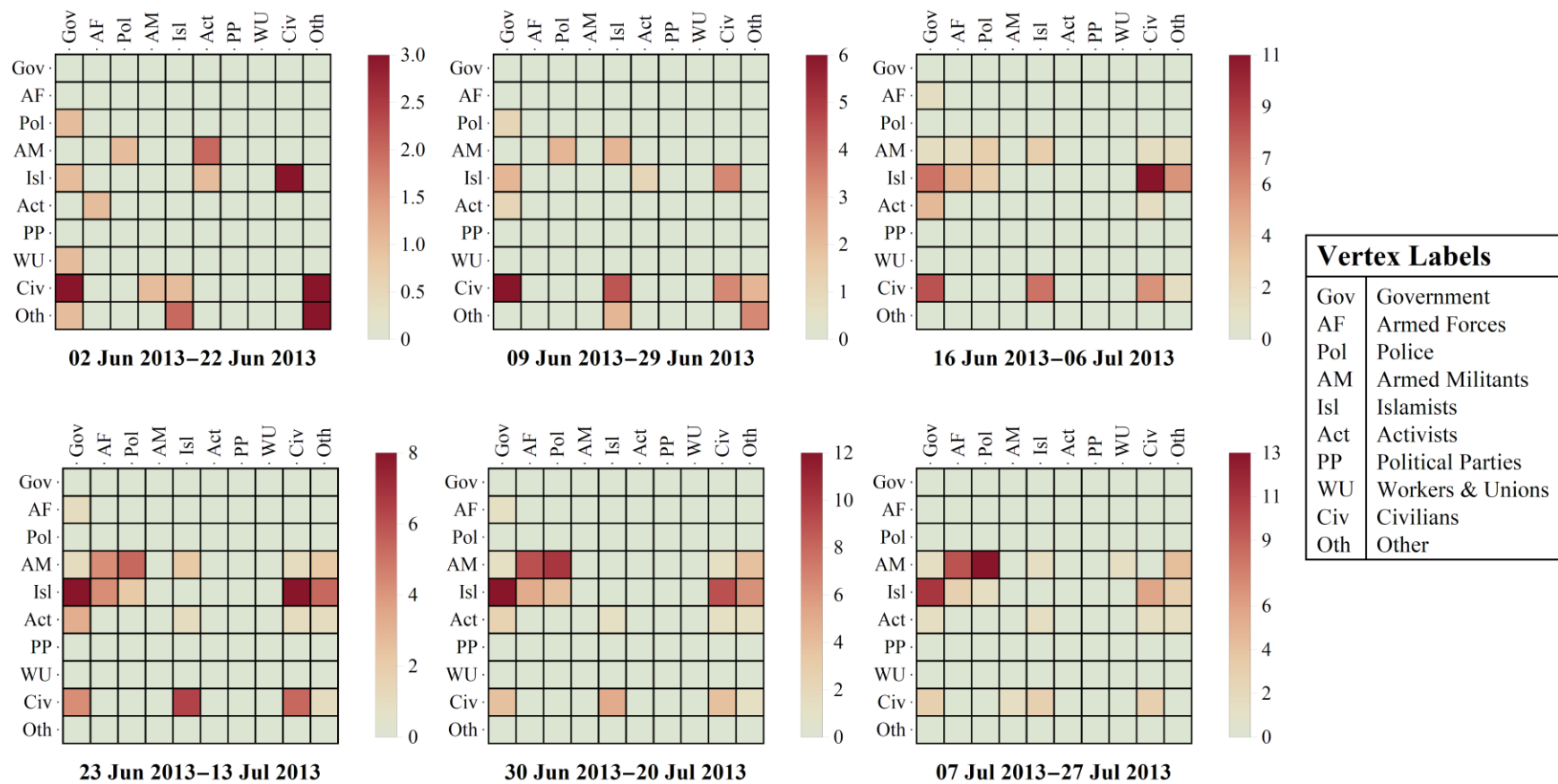


Figure 2.18. Weighted adjacency matrices for contentious relations among categorized vertices surrounding the June 2013 campaign, by 3-week moving window.

Finally, it is important to corroborate the prior observations about differences in the proportions of violent relations from the network diagrams with trend plots. Figure 2.19 disaggregates the events and contentious relations reported in figure 2.5 to show counts of each by type (violent/nonviolent) over time. Figure 2.20 then shows that while both major campaigns saw spikes in proportions of violence immediately after, the field of contention was less than half violent during the 2011 campaign and well above half violent during the 2013 campaign. In addition, the proportion of violence was trending downward after the 2011 campaign, until it reached an inflection point in early 2013 and then continued on an upward trend thereafter.

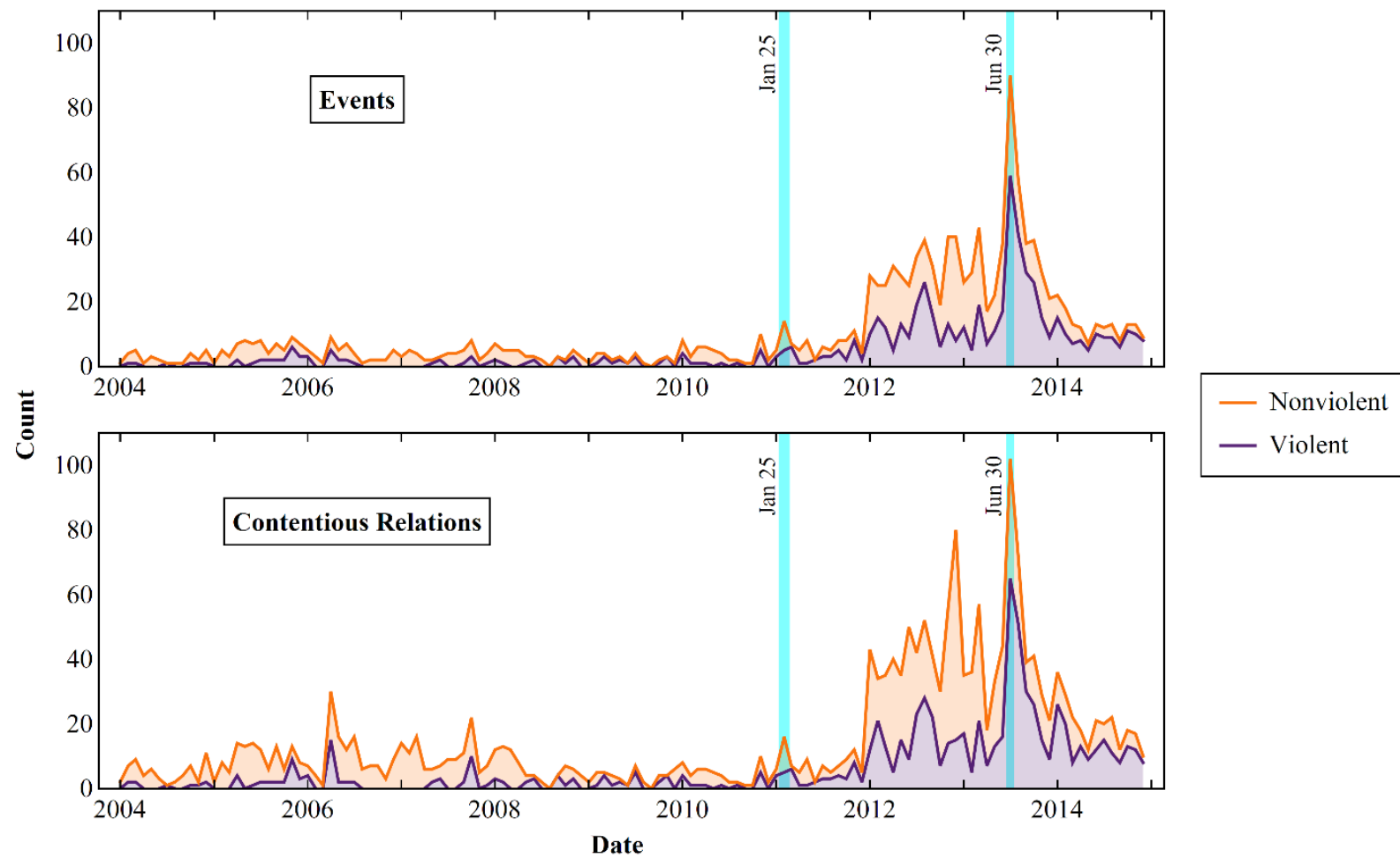


Figure 2.19. Violent and nonviolent action, by month.

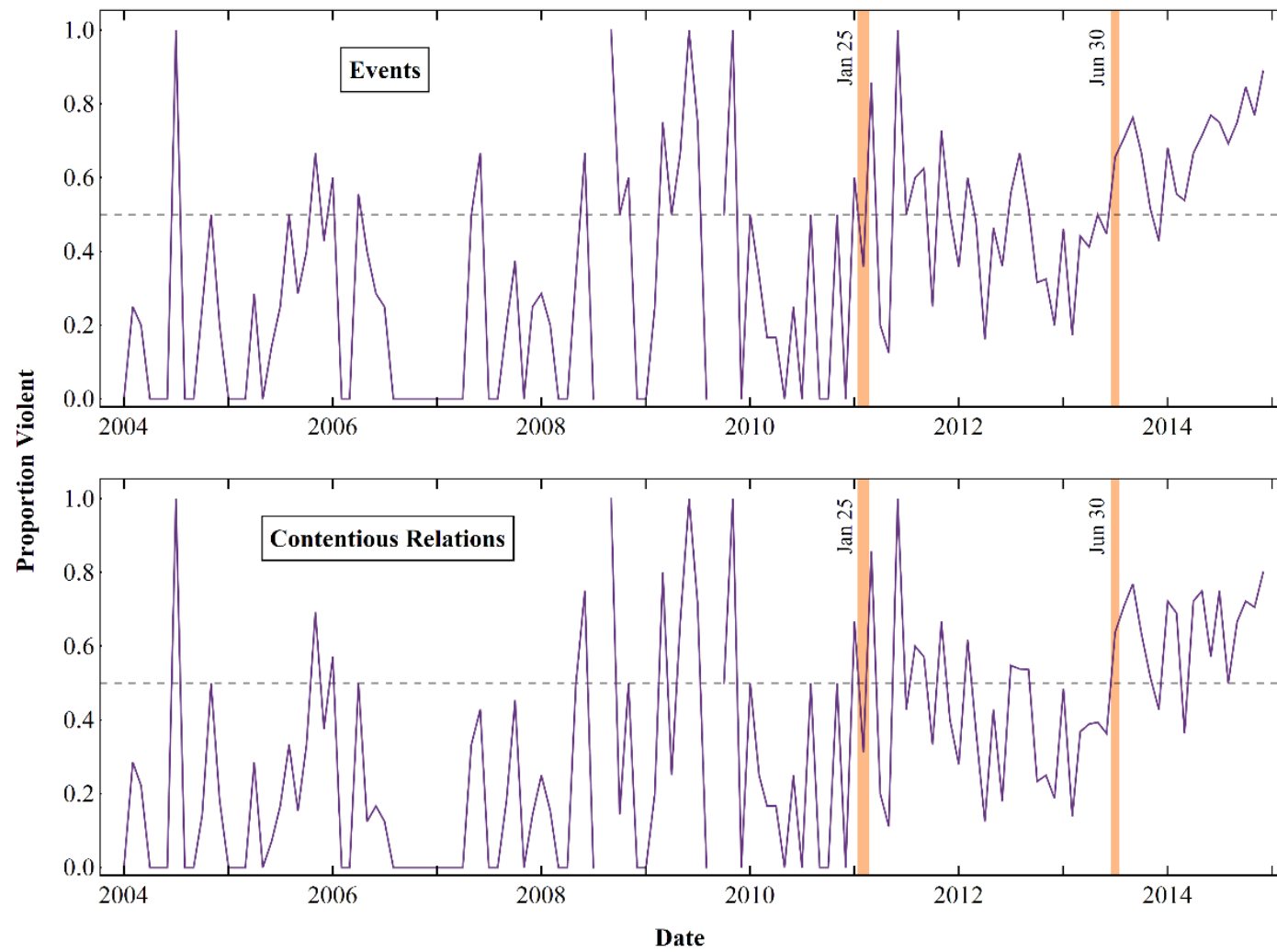


Figure 2.20. Proportions of violent action, by month.

## 2.7 Discussion

This chapter was driven by the question, *what patterns in the changing structure of contentious relations help explain the different gradations of success for the two major civil resistance campaigns in Egypt?* It argued for two main points about how the field of contention changed between 2011 and 2013: (1) that the network became more complex; and (2) that substantive features of relational structure shifted. It is worth taking a step back to appreciate the value of these findings.

The analysis is anchored by a pair of civil resistance campaigns that were similar in many respects: they occurred in the same location; they were initiated by many of the same people; they mobilized a similar number of persons; they were both predominated by nonviolent tactics; and they both sought to remove the head of state and propel the nation toward democratic liberalization. Chapter 1 detailed their differences in terms of target (a long-ruling autocrat, versus a newly-elected Islamist populist), social demographics (cross-cutting and inclusive, versus partisan), and response from the military establishment (crisis response and tacit support, versus active support and coup d'état). In the interest of theorizing beyond the idiosyncrasies of these two campaigns in this one case, the events of the case were tied to generalized civil resistance mechanisms, thereby drawing out lessons for other cases of ambiguous or mixed results. The historical analysis concluded with the recognition that the observations about multiple interacting forces in the process of contentious political transition remained somewhat vague, and that elucidation and further theory-building in that regard would require different sources of information and different analytical lenses. Thus, this chapter dug down to bedrock conceptualizations of conflict dynamics from Simmel and constructed networks of

contentious relations to get a better look at what happened in the Egyptian field of contention surrounding the 2011 and 2013 campaigns.

The network analyses in this chapter were perhaps more thorough than was necessary to demonstrate that the contexts of the two major campaigns were significantly different beyond what was visible in Chapter 1. However, given the larger purpose of theory-building, and the untried application of dynamic network analysis methods, it was important to cover every corner in which relevant findings lay. And it happens that the Egyptian case displayed several intriguing features from a network analytic perspective. That the field of contention in the aggregate is a scale-free network is particularly interesting—a point elaborated upon in the first subsection below (2.7.1). The found trends in clustering and qualitative segmentation have more direct implications for the dynamics of civil resistance, which are address in subsection 2.7.2. Finally, as indicated in the introduction to this chapter, the analysis of contentious relations leaves a large portion of the story untold from a Simmelian perspective. The third and final subsection (2.7.3) sets up the dual analysis of joint action relations, carried forward in Chapter 3.

#### 2.7.1 Implications of Scale-Free Structuring in Conflict Networks

There is no precedent in the literature for constructing networks of contention as done in this chapter, let alone for measuring scale-free structuring within them. One should therefore be cautious about extrapolating general implications until there is enough evidence to establish the scope of the pattern. That said, the findings in this case are robust enough to demand general theoretical consideration, and one need not make many conceptual moves to hypothesize widespread ramifications.

A key reason why scale-free networks have garnered so much interest across domains is because the relatively simple mechanism of preferential attachment can replicate their basic structural properties (Barabási and Albert 1999; Barabási 2009). One therefore tends to assume a growth model for a scale-free network, such that the observed network reflects a history of accumulated interaction roughly proportionate to the number of vertices. That assumption is definitional in the present case, as the aggregate network was explicitly constructed from conflict events data. In addition to demonstrating that a power-law best fits the degree distribution of the aggregate contentious relations network, it was established that preferential attachment is a plausible growth mechanism, on account of the positive correlation between prior degree values and later increases in degree for the same vertices.

There is thus reason to believe that other conflict networks may be simulated by a Barabási-Albert model: this is the first major implication. Specifically, simulated scale-free network construction works by starting with a small number of vertices  $n$  that are fully connected (typically,  $n = 3$ ), setting a final number of vertices  $m$  ( $m > n$ ), setting a small number of vertices  $k$  to add each step ( $k < n$ ;  $k \leq (m-n)$ ), and drawing a new edge from each new vertex to an existing vertex with probability directly proportionate to the degrees of existing vertices (Barabási and Albert 1999). This procedure will quickly and reliably replicate the degree distribution of real scale-free networks. Moreover, it can be used to estimate the future growth of a scale-free network.

However, it would be premature to advocate simulating any given conflict network using the basic preferential attachment mechanism. Unlike the Barabási-Albert model, it has been shown that the aggregate contentious relations network in Egypt grew

not only by adding new edges with new vertices, but also by adding new edges among existing vertices (as well as adding weight to existing edges). It is also important to remember that the observed networks are directed (as opposed to the undirected edges of the Barabási-Albert model), and that there are various features and trends that cannot be explained by the basic preferential attachment mechanism (especially, the evolution of clustering). These could be oddities of the Egyptian case, but like the power-law degree distribution, they are so unlikely to occur at random that they warrant scrutiny. In building models of preferential attachment catered to contentious relations, the above findings about decomposed degree assortativity will be particularly useful. In Egypt, frequent targets (high in-degree vertices) tended to act against frequent actors (high out-degree vertices), while frequent targets tended not to act against other frequent targets, frequent actors tended not to act against other frequent actors, and frequent actors tended not to act against frequent targets. All of these varied within three-month moving windows, but none crossed the origin in the cumulative networks, so it is fair to hypothesize that they could represent attachment preferences more broadly. If so, then they should be reflected in generalized growth models for conflict networks. It is recommended that researchers look for more conflict networks with scale-free structure, summarize growth patterns across cases (including edge directionality), and then calibrate a reliable mechanism for specific application in conflict networks. The rest of the SCAD data is likely the best source for testing the generality of the patterns from Egypt.

If indeed it turns out that scale-free structuring is a common pattern across networks of contention, then it would have critical policy implications. Scale-free



networks are often described as both robust and fragile (Barabási 2009). They are robust in the sense that randomly selecting vertices to remove or otherwise alter is not likely to have a global impact on the network—in terms of diffusing a transmission or splitting the main component, for example—because the vast majority of vertices have only one or two connections. Yet scale-free networks are fragile in the sense that one can strategically select just a few high-degree vertices to remove or alter and it *would* likely have a global impact on the network. If conflict networks are generally scale-free, the robust-but-fragile characteristic means, for instance, that conflict interventions uniformly distributed across a blind sample of conflicting parties are very unlikely to make a dent on the aggregate magnitude of conflict. By the same token, a complex web of contentious relations can most efficiently be influenced by focusing interventions on the main hubs of conflict. This would not shake the paradigms of conflict resolution so much as it would make for better-informed strategic decision-making. Very often those with experience in a field of contention have an intuitive sense of different parties' centrality, and it is common sense to focus one's intervention efforts on the main sources of problems. The point now is that the practical wisdom of conflict intervention could be improved by drawing out all known contentious relations in a field as a formal network, checking to see if the network is scale-free, and if so, then making strategic decisions with knowledge of the ways network is robust and the ways it is fragile.

There is, nevertheless, a vital issue to hold in mind when making any kind of projections about growth or intervention from scale-free networks that were built up from time series data. Unlike the networks in which edges represent durable connections between durable objects, such as the electric grid or the Internet, contentious relations as

defined herein are fleeting, and the vertex definitions are fluid. The benefit of using event data to construct relations is that it allows one to track dynamics across narrow time windows along with the overall trajectory. The trade-offs are that one cannot say for sure whether some or all relations have a life-span beyond their explicit event duration, or whether past vertices will continue to represent future entities in a consistent way. It is justifiable to infer that frequent interaction indicates some underlying crystallization of relations and/or social actors (Simmel 1950), but such an assertion has not actually been advanced in this study. Instead, the purpose was to answer a question about patterns in the context surrounding certain momentary contentious relations (the January 25, 2011 and June 30, 2013 civil resistance campaigns) with two delineated representations of the event data—namely, concatenations of interactions occurring within relatively small and discrete time windows, and cumulative agglomerations of the same interactions within relatively comprehensive time windows. In other words, the basis of relational concatenation is the identification of entities and events within a defined time window, as opposed to any ontological assertions. It may well be the case that frequent interactions among consistently identified entities indicates underlying relational phenomena, such that there is a path-dependency to vertices existence and dyadic interactions, but such assertions are beyond the scope of the analyses in this chapter.

What all this means for scale-free structure in conflict networks is it is ill-advised to think of it as a reified quality of a field that endures across time. At least, not yet. It was argued that it is worth knowing that the structure of a field of contention from a telescopic perspective is scale-free because it immediately suggests that there are complex (non-random) forces in play. That is true of the Egyptian case, and because of

the strength of the finding and the sense its cross-level fractal character makes from a Simmelian-relational understanding of conflict, one may hypothesize that it would be true in other cases as well—assuming the networks are drawn from relatively large time windows. Even so, it would be wise to stop short of venturing that fields of contention are always scale-free based on the present data alone. Indeed, the analyses demonstrate that significant changes in cumulative structure are possible, and it is yet unknown whether other cases display similar trends.

### 2.7.2 Insights into Civil Resistance Efficacy

Implicit in the responses to the research question for this chapter is that the structure of the network of contention bears on the outcomes of the civil resistance campaigns. There is no way to experiment on the case to test how history might have unfolded under different conditions. This being a first attempt to understand civil resistance dynamics with contentious relations networks, there is as present no comparative data to determine the empirical generalizability of the patterns in Egypt. What the above network analytics do is flesh out plausible explanations of civil resistance efficacy with greater precision.

Prior considerations of the structural conditions of civil resistance mobilization and success have assessed the causal influence of macro-economic development, national regime type, regional politics, historical epochs, and international institutions (e.g., Chenoweth and Stephan 2011; Johnstad 2010; Karatnycky and Ackerman 2005; Marchant 2008; Nepstad 2011a; Ritter 2014; Schock 2005; Sharp 2005). The overarching conclusion is that these structural pre-conditions are insufficient to determine civil resistance outcomes, although there is disagreement over whether certain local or

international political opportunity structures are necessary (Ritter 2014; Schock 2005). The way the literature has so far addressed relationality is in the importance of coalition formation and organization within campaigns, the countervailing influences of radical flanks, the benefits of making alliances with disaffected pillars of ruling regimes, and the necessity of openness to liberalization in the international community for garnering outside political pressure (e.g., Chenoweth and Schock 2015; Chenoweth and Stephan 2011; Nepstad 2013a; Ritter 2015; Schock 2005). These are all important developments, leading to a rich understanding of how civil resistance works. The way this chapter was intended to add to them was by shifting the angle of investigation to expose relations and dynamics that were less obvious from the existing case studies.

The insights gained from this new perspective center around the most prominent theme throughout this chapter: complexity. The January 25, 2011 campaign, which led to Hosni Mubarak's departure from office and unprecedented democratization—including national elections, constitutional reform, judicial reform, and civilian oversight of the military—took place against the backdrop of relatively simple networks of contentious relations. They were not so simple as to be completely indistinguishable from statistically random graphs—on account of their average shortest path lengths and decomposed degree assortativity metrics in cumulative windows—which means there was likely some kind of structuring mechanisms generating them. And yet on the basis of the global complexity metrics of cyclomatic number and clustering coefficient (not to mention visual inspection), their relative simplicity is apparent—both within discrete and cumulative windows. More to the point, the easiest way to summarize the structure of the whole field of contention before, during, and after the 2011 campaign matches the

campaign's own internal relational structure: multiple actors aligned in united opposition to the government using predominantly nonviolent tactics.

On the other hand, the June 30, 2013 campaign, which resulted in Mohammed Morsi's ouster and a military coup—leading to extreme political violence against Muslim Brotherhood supporters and severe restrictions on civil society—occurred within a significantly more complex field of contention. The field grew and became more intricately structured in 2012, and the patterns of complexity recurred throughout 2013. The structure of the field did not nearly match the form, direction, or tactics of the campaign. Pick any yardstick, and the point is evident. Even so, amidst such a complex backdrop, the 2013 campaign mobilized millions in disciplined nonviolent tactics and achieved the goal of removing Morsi from office. Given the qualitative similarities of the 2011 and 2013 campaigns, then, one cannot conclude that the degree of complexity in the field determines the mobilization potential of civil resistance. One must turn to dynamics and outcomes for answers.

Chapter 1 demonstrated that variation in the operation and alignment of the mechanisms of civil resistance helps explain similarities and differences in their longer-term outcomes. In particular, it was argued that an ideal-typical way civil resistance prefigures democracy is by mobilizing a coalition that is not just massive, but also inclusive and representative of the contextual social demographics. The measurements of network complexity are so closely tied to the relevant social divisions surrounding the 2013 campaign that it cannot be determined whether one caused the other. Rather, the networks were offered to elucidate the nature of the social divisions surrounding the 2013 campaign. There was much more going on than just fissuring between liberal/secular and

Islamist activists. After the successes of the 2011 campaign, dozens more actors entered the field, their contentious interactions arranged in many small components and one giant component, with less centralized targeting and more transitivity. These features of the field may well have played a double role of increasing the new government's vulnerability and decreasing the prefigurative potential of civil resistance.

The take-away message is not that a chaotic field of contention prevented civil resistance from advancing democratization, but that more complex structures emerged. There was clear order to the field in 2012 and 2013; in many ways, the significance of the network structuring increased as the network grew over time. This in turn compels one to ask, why? What is it about complexity in fields of contention in general that corresponds to the unfolding of civil resistance in Egypt? These questions prompt a return to the mechanisms from Chapter 1. To review, it was theorized that there are five mechanisms by which civil resistance prefigures democracy: (1) fostering inclusive and proactive political participation; (2) organizing civil society; (3) establishing civilian checks on state authority; (4) implementing procedures for nonviolent conflict management; and (5) instituting practices of egalitarian self-governance. The claim was that civil resistance effectively transitions from short-term successes to long-term democratization when all five mechanisms operate in reinforcing conjunction with one another.

There are now many good reasons to theorize that when civil resistance fosters inclusive political participation and contributes to the organization of civil society, it is most effective in advancing democratization when it aligns with and sustains a relatively simple structure of contentious relationality against autocratic governing bodies. This could be considered a counter-point to the conventional wisdom that civil resistance

needs to selectively target pillars of the regime's authority (e.g., Ackerman and Kruegler 1994; Sharp 1973), but that is not the intention here. The findings do not imply that there should be only one target, or even one kind of target, of all contention. Instead, the implication is that the structure of the field should resemble the basic structure of people power, and that civil resistance actions should help (re)shape their respective fields of contention accordingly. For in doing so, the first two mechanisms align with the last, promoting generalized cultural institutions of democratic governance. An atomized and disengaged populace is the contrast by negation; such conditions stunt the efficacy of civil resistance from the outset. One can see more clearly now a contrast by differential operation of the mechanisms: if the way more segments of society get engaged in politics and develop a polycentric civil society is through a tangled web of contention, then that is problematic for democratic prefiguration.

Now this could be misread as a counter-point to the findings that debates and heated disagreements are natural in, even beneficial for, vibrant democratic societies (e.g., Fishman 2004, 2011; Mische 2007), but that is not the intention either. There is a crucial difference between constructive and destructive contention, and that difference is not simply the violence-nonviolence dichotomy. It was already established that nonviolent conflict management is necessary for democracy, and inasmuch as the findings in this chapter underscore that fact, they add to it cautions about the counter-productive potential of nonviolent as well as violent contention. To be more specific, when Egyptian democracy was nascent in 2012, there developed a complex structure of contention—notably among liberal/secular activists, Islamists, and other civilians, but also in other ways detailed in the findings presented above. Without evaluating their

justifications or aims, one observes that the resistance actions against the Morsi administration, culminating in the June 30, 2013 campaign, ostensibly contributed to the complexity of the field of contention. The 2013 campaigners did not, as it is suggested they would be wise to, reshape the field to match the basic structure of people power.

The remaining mechanism, establishing civilian checks on state authority, brings in a related point. When members of the population target military and law enforcement in violent assaults, it undermines the political jiu-jitsu dynamic (Sharp 1973). Sharp's point on this matter is mainly directed at civil resistance campaign organizers, advising them to maintain nonviolent discipline. But there is also the matter of radical flank effects—that is, whether violent actions carried out by actors adjacent to nonviolent campaigns help or hinder civil resistance efficacy. To date, civil resistance scholars find mixed effects of radical flanks, with a bent toward a negative influence on civil resistance efficacy (Chenoweth and Schock 2015; Chenoweth and Stephan 2011). The findings of this chapter seem to support those of Chenoweth and Schock (2015), in that when simultaneous armed resistance benefits civil resistance, it appears to be short-term only. The network analyses add to this statement of tendency some explanatory reasoning in line with the overarching themes of this dissertation. Assaults on the strong arms of state authority may weaken or overpower pillars of the regime, thus widening opportunities for anti-regime campaigns. At the same time, depending on the structure of contentious relations in the field, armed resistance can complicate the field and narrow opportunities for democratic prefiguration.



### 2.7.3 Returning to the Opposition-Cooperation Dualism

In all this discussion of the context surrounding the civil resistance campaigns in Egypt, care was taken to avoid conflating the network of contentious relations with “the context” in general. There is much to the context that has not been addressed, which was necessary to set aside to focus on the contentious relations. However, veiled between the lines of the structure of contentious relations is a set of relations that simply cannot be ignored in this dissertation. These are the other side of the Simmelian-relational dualism introduced at the beginning of the chapter—the dynamics of cooperation that coincide with opposition in social conflicts. The data showed the explicit oppositions among contentious dyads, as well as divisions among identity categories as these dyads combine in networks. In the discussion of these patterns, it was indicated that alignment of diverse actors is important, but without examining the extent to which they aligned, or whether and how alignments changed. The very same conflict event data can be used to extract data on cooperation, because the records indicate which actors effectively acted jointly by targeting the same entities at the same time. The networks of these induced joint action relations are of course related to the networks of contention, but the former do not contain exactly the same information as the latter, and so they need to be analyzed in their own right.

CHAPTER 3:  
THE DYNAMICS OF JOINT ACTION  
IN THE EGYPTIAN FIELD OF CONTENTION

### 3.1 Introduction

What was introduced in Chapter 2 as the Simmelian-relational understanding of conflict is a simplified framework used to guide the investigation of the intricate patterns of political interaction surrounding the Egyptian civil resistance campaigns of January 25, 2011 and June 30, 2013. In some respects, the findings of the previous chapter stand on their own, as there is ample evidence for the main points about complexification and segmentation in the Egyptian field of contention in the networks of contentious relations. And yet, the framework established there can only be partially substantiated by an analysis of contentious relations, because it theorizes dual forces of opposition and cooperation. The latter category is addressed in this chapter, thereby completing the study of the Egyptian case.

It is an inescapable fact of social research that theoretical ambitions must be tempered in accordance with available data. Ideally, there would be direct measurements of cooperative action to match the conflict event records available in the Social Conflict Analysis Dataset (SCAD). Unfortunately, no such dataset exists for the same entities as extracted from the conflict events in Egypt. However, SCAD does list up to three distinct

actors within the same event record (Salehyan and Hendrix 2014a), which effectively indicates cooperation among these actors amidst their contentious action. While only a small minority of records for Egypt explicitly listed multiple actors (12.5%), the issue of limited data is remedied by loosening the criteria for indications of effective cooperation. As explained in detail below, any simultaneous mutual targeting is taken as an indication of effective cooperation among actors at the time of their contentious action, and the resulting connections between pairs of actors are here referred to as “joint action relations.” Like contentious relations, joint action relations measure only part of the underlying phenomenon, which constrains the theoretical moves one may safely make. Limited as they are, however, the combination of networks of contention and joint action give penetrating insight into the intertwined duality of the concepts of opposition and cooperation in the Simmelian-relational framework.

With the analyses of joint action relations included in this chapter, what one finds are some of the immediate implications the oppositional forces had for cooperative forces—by extrapolating implicit cooperation on the basis of simultaneous mutual opposition. Such reliance on extrapolation may seem at first blush like preparing to chase a mirage, or to march in a circle. But it turns out that there are different and interesting features surrounding the campaigns of 2011 and 2013. The examination of these features is guided by a very similar research question to that of Chapter 2: *what patterns in the joint action relations help explain the differences in civil resistance efficacy between the two major civil resistance campaigns in Egypt?*

In answer to this question, this chapter argues on one hand the meta-level point that networks of joint action contain insights about the Egyptian field of contention that

were not manifest in the preceding analyses of networks of contention. In essence, these analyses highlight the evolving structure of alignments among entities, which was obscured in the networks of contention. On the other hand, the evidence presented below contributes to two main points about the specific patterns of joint action relations. First, the networks of joint action were significantly complex throughout the period encompassing both campaigns, displaying a repeated pattern of one large, dense connected component surrounded by a few small components and many isolated vertices. Virtually all instances of this structural motif were statistically rare among congruent random graphs, but the pattern varied over time in the magnitude and character of complexity it contained—with peak complexity coming several months before the less successful 2013 campaign. Second, the networks of joint action surrounding the two major campaigns displayed several contrasts in substantive features, including greater assortative mixing by identity category, lower proportions of underlying violent actions, and more relational stability during the 2011 campaign than during the 2013 campaign.

As with the work of Chapter 2, the present analyses of dynamic joint action relations networks are unprecedented, and so great care is taken to justify the methods and provide ample evidence in support of the claims. The organization of this chapter thus mirrors that of the previous chapter. The second section (3.2) establishes the working definitions for joint action relations and networks thereof. Section 3.3 recapitulates the key metrics for contentious relations networks and introduces a few new measures catered to joint action relations. The fourth section (3.4) clarifies the methods as they apply to the specific data, and the fifth (3.5) presents the body of evidence in support of the main arguments. In the concluding sixth section (3.6), the key findings are

interpreted and assimilated into the discussion about civil resistance efficacy began in Chapter 2.

### 3.2 Defining Networks of Joint Action

Before diving into the construction of joint action relations, some conceptual brush-clearing is necessary. First, it is important to note that joint action relations do not derive from or result in bipartite graphs. A bipartite graph is one in which the vertices may be divided into two sets, such that all edges the graph exist only between vertices of opposite sets (Harary 1969). In social network analysis, bipartite graphs are most often encountered in affiliation networks (or “bimodal” networks), wherein each edge is drawn between an individual and a social group with which that individual is affiliated (Wasserman and Faust 1994). Although actors and targets are distinguished, the definitions of both are relative to contentious relations. No entity is assigned a fixed trait of actor or target, so there are no a priori restrictions on whether any two entities may share a contentious or joint action relation. And in fact, given the source data from Egypt in the years 2004 to 2014 (see section 3.4), there is no bisection of vertices in either the aggregate contentious relations network or the aggregate joint action relations network that can produce a bipartite graph.

Second, caution is required to avoid equivocation with the term “duality.” Duality in graph theory (as well as geometry and combinatorics) has a precise meaning that corresponds neither to the conceptual sense of duality of opposition and cooperation, nor to the construction of joint action relations. There is a high risk of confusion on this point because of the prominent place in the literature for “duality” in social networks. In the basic sense, graph dualism applies to planar graphs, which are those that can be drawn on

a two-dimensional surface without any edges crossing—such that cycles form the boundaries around surface regions. The dual of a planar graph is constructed by placing vertices within every separate region of the plane, including one vertex for the entirety of the external space, and drawing edges between pairs of these new vertices for every edge that separates them (Harary 1969). Such dualisms are particularly studied in relation to the planar graphs of convex regular polyhedra (Coxeter 1973; Grünbaum 2003). That is not the direction this chapter is heading with joint action relations. The analyses are not concerned with higher dimensions, and there is no reliance on cycles within contentious relations networks to construct joint action relations.

In the sense of the famed “duality of persons and groups” in social networks (Breiger 1974), the precise meaning of duality rests on mathematical lattice theory (Birkhoff 1967). Lattices can be constructed from social networks by obtaining the intersections and nestings of social circles that are either derived from the structure of dyadic social relations (e.g., cliques; Freeman 1996) or are measured directly as social affiliations (e.g., club memberships; Breiger 1974). Any bipartite graph will suffice to construct a lattice (Wille 1982). It is often useful to construct lattices from affiliation networks because they elaborate the internal structure of affiliations, thereby allowing for clearer comparisons between affiliation networks (Freeman and White 1993). Within such lattices, the “duality” is a bidirectional dependency: the intersections of social groups depend upon the mutual inclusion of persons, and the ties among persons depend upon their affiliations with social groups. This is not the case for the contentious relations and joint action relations analyzed in this dissertation, because joint action relations depend upon contentious relations, but contentious relations do not depend upon joint

action relations. Moreover, in constructing joint action relations, information about directionality and mutual targeting in contentious relations is left behind, so it is not possible to reverse the construction and re-create contentious relations from the information contained in joint action relations networks alone.

Before detailing the criteria used to construct joint action relations, it is worth reiterating that the duality between oppositional and cooperative forces in conflict rests at a general, theoretical level. Contentious and joint action relations are used to analyze aspects of each, but in doing so, manifest observations are not conflated with the theoretical forces they indicate. It would require more data than are presently available to model the theorized duality of conflict exhaustively.

### 3.2.1 Mutual Targeting and Simultaneous Action

At the base levels of interpersonal and intergroup conflict, the Simmelian-relational framework compels one to search for evidence of interdependent in-grouping and out-grouping dynamics. With the conflict data and flexible identification of vertices introduced in Chapter 2, the matter of capturing cooperative dynamics is not so straightforward as differentiating groups of vertices. It is plausible to interpret some entities as generalized categories or supersets of other vertices, but the present analysis intentionally avoids such moves. To follow up the argument in Chapter 2 for avoiding slippery slopes, it is worth knowing when the same persons or organizations are differentially recognized according to the capacities in which they act. In other words, it is useful in dynamic conflict analysis to track interactions among social constructions, and not just tangible social units. To track literal human bodies would constrain the analysis, preventing observation of relevant features of the source information—namely,

relations among abstract forms of collective actors, including those that may not be mutually exclusive in their composition.

Thus, the entities in joint action relations are exactly the same as those specified in contentious relations. The crucial distinction is that only those entities that were at some point actors in contentious relations are permitted to have joint action relations, because joint action relations are defined by simultaneous acts of contention by two actors who targeted one or more identical entities (figure 3.1). An intuitive example is of two persons participating in the same protest event: without knowing anything else about these participants, the fact that they simultaneously acted in opposition to the same thing is sufficient to record a joint action relation between them for that instance. With conflict data encompassing various types of contentious acts in time and place, no constraints are placed on the characteristics of actors, targets, or contentious relations that may serve as the basis for joint action relations.

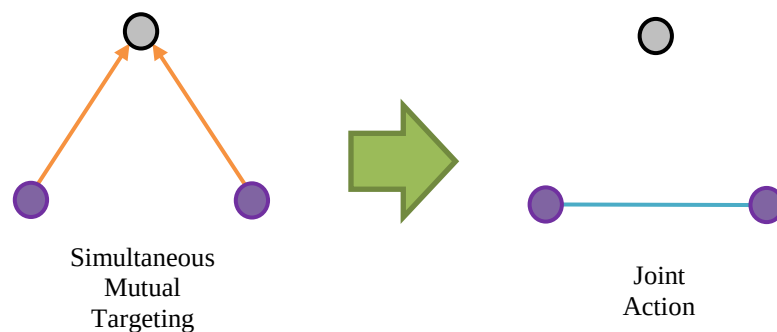


Figure 3.1. The construction of joint action relations.

The trick is how to define “simultaneous.” The conceptual floor for joint action is that entities be explicitly identified as actors in the exact same event, and the conceptual ceiling is that actors share at least one target at any time in the widest window of



observation. In order to address the aforementioned problem of limited data at the conceptual floor and still be able to explore dynamics of joint action, “simultaneous” needed to be defined somewhere in-between. In order to avoid stretching too far from the source data, a window of three calendar weeks was applied, such that any two actors with contentious relations intersecting by at least one mutual target within a three-week window (inclusive of events occurring in any portion within the window) receive a joint action relation between them. Three weeks was selected for the width of the windows by reasoning that for any given event, whatever else was happening during the current week, the week immediately before, or the week immediately after was close enough to be considered simultaneous relative to the decade-wide comprehensive window. This also matches the narrowest window in which contentious relations networks were analyzed, and it makes for a natural moving window of one-week increments.

An important consequence of defining joint action relations on the basis of mutual targeting is that it allows disconnected vertices in joint action networks, which was not possible in the contentious relations networks, because every entity is only introduced relative to a contentious relation based on a conflict event. One might consider dropping the isolated vertices to focus more on the constructed joint action relations, but that would prevent observations of the absence of joint action (given available data). It is worth knowing which among the entities that were present in the field of contention were not acting jointly with any others, and what implications that has for the global structure of the joint action network.

### 3.2.2 Aggregation, Weighting, and Evolution

With a set time window to define simultaneity, there is a basic level of aggregation for all joint action relations derived from events with duration shorter than the time window. The conflict data used in this chapter, for example, measures event duration in days, with most events lasting only one day (see section 3.4). The contentious relations derived from this dataset began as discrete (unweighted) edges for every event in its recorded duration, and they were aggregated to weighted edges within larger time windows. The joint action relations, by contrast, begin as weighted edges within the three-week windows of aggregation. The way joint action relations are weighted also differs from that of contentious action relations. For contentious relations, edge weight was simply a function of the number of events within an aggregation window. But joint action edges can be based on multiple events engaging multiple targets, so weighting is a bit more complicated.

The process for aggregating and weighting the basic joint action edges was as follows. Contentious relations were aggregated into three-week windows (moving in intervals of one week) and reduced to weighted edges by adding up event counts for each dyad. Actors with mutual targets within each three-week window were identified and the minimum weight among the contentious relations involved in the mutual targeting was saved—as that represents the maximum number of times joint action occurred among all actors sharing a target in the window. This results in multiple joint action edges between actors that shared multiple targets during the same window. Multiple edges within the same window were consolidated and the weights from their preliminary constructions were summed. In this way, higher numbers of events and higher numbers of mutual

targets contribute separately to the weight of the basic joint action edges in the three-week windows.

All aggregations within time windows wider than three weeks are based on the basic joint action edges. That is, aggregations of calendar months, calendar years, and spans of multiple years do not change the definition of simultaneity. Thus, for example, two different actors targeting the same entity during the same year, but several months apart, would not receive a joint action edge in the aggregation for that year, because their actions did not occur close enough together to be considered simultaneous. By contrast, repeated joint action from disparate three-week windows within the same aggregation period first shows up as multiple joint action edges, which are then consolidated into one joint action edge for the aggregation period, with summed weights.

The various time windows used here are the same as those of Chapter 2, with similarly inclusive criteria for edges resulting from events that spanned temporal boundaries. The caveat is that for joint action edges, the smallest temporal unit is not the day, but the three-week window, so there is more blurring across nominally discrete time windows with the joint action relations than there was for the contentious relations. This greater blurring has the effect of smoothing fluctuations in network metrics over monthly and yearly intervals more than would be the case if narrower time windows were used to define simultaneity. In particular, it is important to note that, because three weeks is so close to the length of the average calendar month, network dynamics measured in calendar months are smoothed to a much greater extent with joint action relations than they were with contentious relations.

### 3.3 Relevant Metrics and Patterns Revisited

Like with the contentious relations networks, the starting point is an investigation of whether there is complex structure in the joint action relations networks. The search is now easier, as it is guided by the findings from the contentious relations. Given that the metrics tracked for the contentious relations networks could be manifested in various arrangements of joint action relations, the metrics observed in this chapter tell more about the structure of contentious relations. But the goal here is to expand the understanding of the relational context of civil resistance in Egypt, and not just to reaffirm previous findings. The search headings in this chapter, therefore, sharpen the analyses of network complexity with more focus on the dynamics of main component size and clustering (see subsection 3.3.1), and stretch the analyses of both structural and substantive dynamics with new metrics of relational volatility (see subsection 3.3.2). While striking contrasts between the 2011 and 2013 campaigns are still sought, with the more precise measurements of this chapter, subtler differences will be highlighted as well.

#### 3.3.1 Components and Clustering

In the contentious relations networks, attention was paid to (weakly) connected components because they provided basic information on whether discrete acts of contention were related within the wider field of contention. When there are multiple (weakly) connected components present at a given time, it indicates that there are multiple non-interacting sub-fields of contention. In the shift to joint action relations, one is able to investigate an aspect of actor connectivity that is closer to conventional intuitions in social network analysis. When joint action relations concatenate into a contiguous network, they display indirect and distant cooperative connections, along with

the direct connections.<sup>28</sup> Disjoint subgraphs in a contentious relations network will naturally produce disjoint subgraphs in its corollary joint action relations network. But as mentioned above, the difference is that joint action networks can also have isolated vertices, which arise when there are entities that served only as targets or that were unique in their contentious action at the time. The anticipation, therefore, is that joint action relations networks will have relatively high counts of connected components compared to their edge and vertex counts, which equates to relatively high cyclomatic numbers.<sup>29</sup> As before, the cyclomatic number serves as the baseline measure of complexity, and observed cyclomatic numbers are compared to those of random graphs (following Erdős and Rényi 1960) with the same vertex and edge counts as the observed networks to determine whether baseline complexity in the joint action relations networks is abnormally high or low.

What is already known about the structure of contentious relations can be extended to shape expectations for the structure of joint action relations. The star-like motifs indicative of the scale-free structure in the networks of contention translate to two different motifs in networks of joint action, depending on the direction of contention. Hubs with high in-degree (“sinks”) in the contentious relations networks produce cliques (fully connected sets of vertices; Luce and Perry 1949) in the joint action relations networks, whereas hubs with high out-degree (“sources”) produce isolates in the joint

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<sup>28</sup> Joint action relations are undirected, so there is no distinction between strongly and weakly connected components—just simple connectivity.

<sup>29</sup> Recall that the cyclomatic number equals the number of edges, minus the number of vertices, plus the number of connected components (McCabe 1976). This value summarizes the amount of elementary information contained in a graph.

action relations networks (figure 3.2). This means that networks of contention characterized by one central sink will produce a dense cluster of joint action relations. It can also be anticipated that networks of contention containing a sizeable portion of disconnected dyads will produce networks of joint action with a sizeable portion of isolated vertices. For more complex structures among contentious relations, however, it is not so easy to tell what the effect will be for joint action relations. It can generally be expected that greater modularity in the scale-free structure of contentious relations—that is, star-like motifs with few or no links between them—will produce more components in the networks of joint action than highly interwoven webs of contentions will. But it all depends on how exactly the clusters within contentious relations networks are connected.

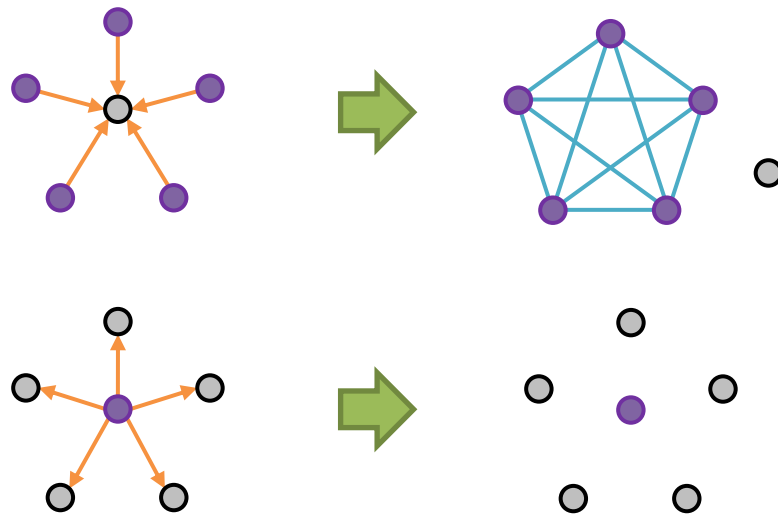


Figure 3.2. Contrasting implications of star-like motifs in contentious relations networks (left) for joint action relations networks (right): sinks to cliques (top) and sources to isolates (bottom).

The substantive consequences of these structural implications should not be overstated, because joint action relations do not correspond to direct observations of

cooperation. Nevertheless, it is fair to draw out rudimentary insights into the structure of political relations in a field of contention. Most importantly, as figure 3.2 illustrates, identical levels of complexity in the structure of contentious relations can imply dramatically different gradations of complexity in the structure of joint action relations, depending on the direction and intersection of targeting. The evidence for scale-free structure in the aggregate network of contention provided in Chapter 2 ignored edge direction, which is why it was supplemented with decomposed degree assortativity metrics. And yet those findings do not necessarily imply the structure of joint action relations, because even in their decomposition, they are global metrics. The same point applies to the clustering metrics (global clustering coefficient and average shortest path length). The presence of large and/or multiple cliques will naturally boost the clustering coefficient and reduce the average shortest path length, but one cannot say what the nature of clustering among joint action relations will be based on that of contentious relations. While a researcher could ascertain most of the structural features of joint action relations by examining all of the three-week network diagrams for the contentious relations, it is much easier to construct the joint action relations networks and analyze them using the same metrics as before. In so doing, one can determine whether and to what extent complexity in contention translated to complexity joint action—and how the trends over time of both compare to one another.

Because there are so many ways contentious relations networks can lead to disconnection and isolation among vertices, special attention should be paid to the largest components of the networks of joint action. Having one relatively large component in a contentious relations network is a necessary, but not sufficient, condition for a similarly

large component in the corresponding joint action relations network. Thus, if a majority of vertices end up being connected in a main component of a network of joint action, then it means that there was a particular arrangement of contentious relations in place to weave a sizeable fabric of joint action—this is, a kind of structure within the field of contention that was not directly evident in any of the analyses of Chapter 2.

The presence of a relatively large (or “giant”) component is typically associated with the phenomenon of percolation in the natural science applications of graph theory (Albert and Barabási 2002). The original question of percolation pertained to critical thresholds in the probability of individual edge formation in Erdős-Rényi graphs that would create a pathway that passes completely through some medium (Stauffer and Aharony 1992). In more general terms, percolation is simply the point at which some pre-determined critical proportion of vertices become connected in a main component (Albert and Barabási 2002). This general concept of percolation is applied to networks of joint action with measurements of the proportion of vertices in the largest connected components to determine whether and when a simple majority of vertices became connected. In addition, the likelihood of observed main component sizes is assessed with reference to random (Erdős-Rényi) graphs of the same size.

The flip-side of the potentiality of complex structuring in networks of contention is the creation of rather large cliques in the networks of joint action. There is thus good reason to go beyond the measurement of triadic closure given by the global clustering coefficient and track maximum clique size in the joint action relations networks over time. It is already known that the inward pointing variants of star-like motifs among contentious relations will produce cliques among joint action relations at the same



moment (figure 3.2), but because joint action relations are aggregated differently than contentious relations, it is not necessarily the case that the large sinks observed in certain monthly and yearly networks of contention will produce concomitantly large cliques in the networks of joint action. If there are indeed rather large cliques among the joint action relations, it means the underlying structure of contentious relations was sufficient to produce a noteworthy level of cohesion on the cooperation side of the duality. Such structures also serve as further evidence of non-random structuring, as cliques larger than four are extremely rare in all but the densest of graphs (see Martin 2009).

### 3.3.2 Relational Volatility

It is natural to think of a cooperative relation as something that endures relatively steadily. However, when the investigation of cooperative dynamics is narrowed to joint action relations inferred from contentious events, which are momentary by definition, one lacks the basis to suppose that joint action relations would be steady. What one can do instead is examine the volatility of joint action relations and compare it to the structural trends found in the above metrics. It could be that some edges endure through changes in network structure, or it could be that there is churn within repeated structures. Relational volatility thus exists at the edge level, and it can be measured directly in two ways: novelty and persistence.

Edge novelty is defined as the proportion of edges in a given discrete time window that never occurred in any previous time window. Edge novelty is herein tracked by calendar month throughout the 2004-2014 period. Given that many new contentious relations formed after 2011, there is likely to be a high proportion of novelty in joint action relations after 2011. Consequently, amidst a general trend of high novelty, the aim

is to find dips and declines in edge novelty, which indicate moments when a sizeable portion of joint action relations have re-emerged. In addition, edge novelty will be considered in relation to measures of network structure. If most joint action relations are novel while certain structural features remain steady, then it would signal that those features are important to the order of the field in their own right (as opposed to epiphenomenal).

Edge persistence is defined as the proportion of edges in a given discrete time window that also occurred in the time window immediately prior. Here again, edge persistence is tracked by calendar month throughout the years 2004-2014. There is little to guide expectations for edge persistence other than the same knowledge that there was a sharp increase in contention in 2012. In months when most joint action relations are novel, the proportion of persisting edges will naturally be low. But because persistence tracks consistency across consecutive months only, it may not be the case that dips or declines in novelty translate to higher levels of persistence. Attention should therefore be focused on the major campaigns of 2011 and 2013 to see whether there are differences in the persistence trends surrounding them.

### 3.4 Data and Methods

As in Chapter 2, data for this chapter derive entirely from the Social Conflict Analysis Database (SCAD), version 3.1 (Salehyan and Hendrix 2014a; cf. Salehyan, et al. 2012). The same set of extracted events from Egypt with explicit identifications of both actors and targets are used (n=1,381), and as before, the analyses focusing on trends over nominally discrete time windows are limited to events occurring during the years 2004 through 2014 (n=1,270). These windows are qualified as *nominally* discrete because

events in the dataset may last multiple days and all events that occurred in any portion within a monthly or yearly time window are included. For cumulative time windows, the inclusion is always from the first observation in 1990 until events beginning before the end of the month in question—even though trends are only plotted from 2004 onward.

Following the above guidelines for the construction of joint action relations, and networks thereof, all joint action relations are based on a simultaneous mutual targeting within the contentious relations networks—with “simultaneous” being defined by a three-week (21-day) window incremented in intervals of calendar weeks (Sunday-Saturday). Given this grounding, all networks of joint action beyond a three-week window are aggregations, wherein edges are consolidated and weighted as needed. This produced a total of 1,294 distinct joint action relations among 279 actors during the 2004-2014 period. It also leaves 461 entities from the contentious relations during the same period without any joint action relations—i.e., the majority of entities had no joint action relations. The isolate vertices are not plotted in the comprehensive joint action relations network to reduce visual clutter, but they are shown scattered around the connected components in network diagrams for narrower time windows to highlight the lack of potential joint action.

By using the same vertices as extracted from the conflict event data for networks of contention, the analyses of joint action relations do not bear on any cooperative relations amongst entities that may be nested within collectivities represented by single vertices. In fact, the same could be said of all sorts of cooperative forces not measured by joint action relations. Therefore, whereas the presence of joint action relations can be

interpreted as a positive indication of cooperation, the absence of joint action relations, strictly speaking, cannot be interpreted as evidence of a complete absence of cooperation.

The same categorical labels for entities (vertex colors) are retained from the analyses in Chapter 2: civilians; activists; workers and unions; Islamists; political parties; government; police; armed forces; armed militants; and other. It is now doubly noteworthy that all non-social entities were placed in the “other” category, because these inanimate objects could not possibly be actors, and therefore could not possibly carry joint action relations. By the same token, there is no distinction between actors and targets in the networks of joint action, as all relations are represented by undirected edges between entities in their capacity as actors. This in turn means that the adjacency matrices presented in this chapter are symmetrical across the diagonal.

The data from SCAD about event type is again used to quantify the proportion of violence in joint action relations and visualize these proportions using the same edge coloring scheme as for contentious relations. As a reminder, relations are coded as “violent” based on their underlying events, labeled in SCAD as “organized violent riot,” “spontaneous violent riot,” “pro-government violence,” “anti-government violence,” “extra-government violence,” and “intra-government violence.” The remaining event types are coded as “nonviolent”: “organized demonstration,” “spontaneous demonstration,” “general strike,” and “limited strike.” The original event types are mutually exclusive, and missing values are coded as neither violent nor nonviolent. For both (weighted) joint action relations and sums within time windows, the proportion of violence is computed on the basis of the original events from which joint action is derived. For a joint action relation constructed between actors explicitly listed for the

same event, the edge color simply reflects the type for that event. Many joint action relations plotted below are aggregated, however, and their proportions of violence are computed according to all underlying events—in the same manner as for contentious relations.

The methods of analysis are essentially the same here as in Chapter 2. The conflict event records for Egypt are still presumed to be as comprehensive as they can be given the scope conditions of SCAD, which again means that the available data cannot be treated as a probability sample of some wider population of real conflicts. Observed graphs can nevertheless be assessed statistically using Monte Carlo methods—i.e., by comparing observed measurements to the distribution of the same measurements on a large number of simulated random (Erdős-Rényi) graphs with the same vertex and edge counts. For every time window in the trend plots below, 2,500 Erdős-Rényi graphs of the same size as a given observed graph were generated. The relevant metrics were computed across all simulated graphs at all times, and the arithmetic means of the resulting simulated metrics serves as the expected values for the observed graphs. Statistical significance is then assigned to observed values with  $p \leq 0.05$  in a two-tailed test based on the simulated metrics. This means statistically significant values are unlikely to result from random construction processes, and therefore call for a theoretical explanation, while statistically insignificant values reflect a rather ordinary structure that is easy to simulate and predict by random processes.<sup>30</sup>

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<sup>30</sup> Unlike in Chapter 2, there is no need to venture into maximum likelihood estimation for fitted degree distributions in this chapter, because there is no *prima facie* evidence for scale-free structuring in the joint action relations network. See section 3.5.1.

It is crucial to underscore that all simulated graphs used in this chapter are based on the joint action relations constructed from the conflict data. The alternative would be to take the simulated graphs for the contentious relations in three-week windows and construct joint action relations from those. The problem with constructing joint action relations from simulated contentious relations is that the resulting graphs would not necessarily match the edge counts of the observed networks of joint action (because the very existence of joint action relations is highly sensitive to the exact structure of contentious relations), which in turn would undermine the Monte Carlo approach. It is necessary to have all simulated graphs be congruent to their respective observed graphs in order to reach conclusions about the statistical likelihood of observed graph structure.

The main difference between the network analytics in this chapter compared to Chapter 2 is in the metrics considered, as justified in section 3.3 above. In addition to cyclomatic number, global clustering coefficient, and average shortest path length, here complex structuring in networks of joint action are further interrogated with measurements of the proportion of vertices in the largest connected components and the vertex count of the largest cliques. The volatility of the joint action networks is also quantified with measurements of edge persistence and edge novelty. Joint action relations are not directed, so there is no need to simplify the observed graphs to compute any of the path-based metrics.

Finally, it bears repeating that inferences from the Egyptian case to comparable cases of civil resistance must be made by analogy, rather than by asserting that measured quantities from this one context are representative of other contexts. Any discussion of the attributes of other cases is deliberately avoided in this dissertation. The investment

instead lies in formalizing the patterns surrounding the within-case dynamics, because the goal is to theorize as generally as possible from the mixed outcomes of civil resistance in this especially rich case. The findings on joint action relations in Egypt are presented in the next section (3.5) with limited commentary, and then interpreted for the purposes of theory-building in the discussion section (3.6).

### 3.5 The Dynamics of Joint Action Relations in Egypt

The presentation of evidence in this section is very similar to that of 2.6, with more information than is necessary to convey the main points about complexity and volatility, yet all included for the sake of due diligence in an investigation that lacks precedent in the literature. The trend plots span the years 2004-2009 to show plenty of historical reference and make it clear whether the features discussed between the 2011 and 2013 campaigns are indicative of historically common ebbs and flows. In many of the plots, one can see evidence of the waves of contention surrounding the *Kefaya* movement in 2004 and 2005 and the origins of the April 6 Youth Movement 2008 (see Chapter 1). Those events are left without further comment in order to focus most of the analyses on the years 2010-2014.

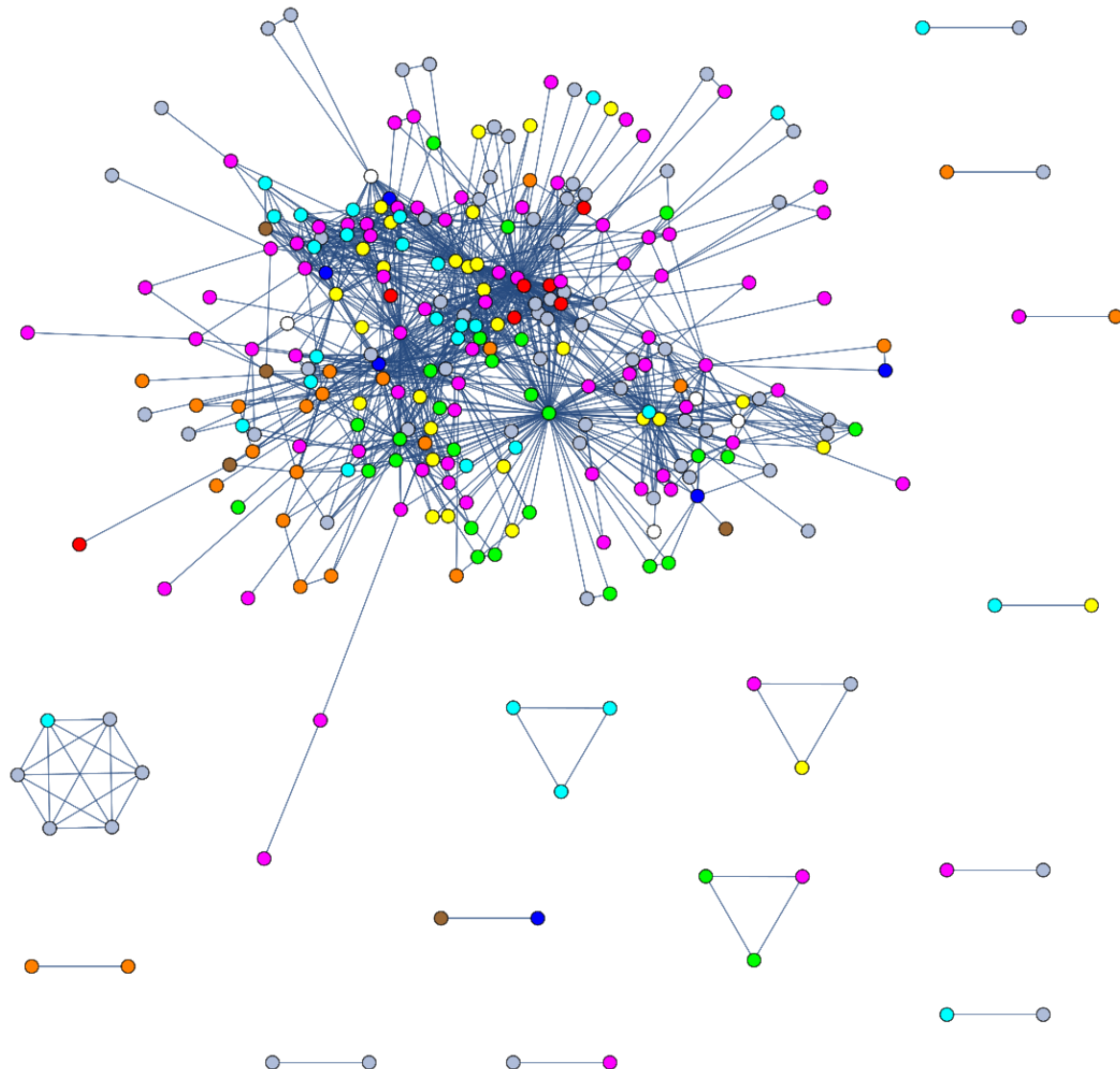
#### 3.5.1 The Other Sides of Complexity

Much like the aggregate contentious relations network, the network of joint action relations for the full period of 2004-2014 consists of one large component and many much smaller components, including 461 isolated vertices (figure 3.3). This is understandable, given the structure of the contentious relations network for the same period—which had a giant component with a significant degree of clustering among

contentious relations, surrounded by many small components. However, joint action relations exist only when contentious relations occur simultaneously within a tight window (3-weeks), so the fact that most of the joint action relations concatenate into such a large subgraph is remarkable. With a little more modularity within the network of contention—even without segmenting the giant component—the joint action relations network could just as easily be segmented into several smaller components. Given the presence of sizeable main components on both sides, the immediate conclusion to draw is that the Egyptian field of contention was rather coherent with respect to both oppositional and cooperative relations. The field, in other words, was such that most of the contentious and joint action relations clumped together over time, and that indicates right away that there is more order among these relations than the mere fact that their underlying events occurred in the same country. With further inspection of the network of joint action, it will become clear that many of its structural properties cannot be explained away as likely to result from random construction processes.



Figure 3.3. The network of joint action relations in Egypt, 2004-2014  
(excluding 461 isolated vertices; next page).



| Vertex Colors                          |                   |
|----------------------------------------|-------------------|
| <span style="color: red;">■</span>     | Government        |
| <span style="color: brown;">■</span>   | Armed Forces      |
| <span style="color: blue;">■</span>    | Police            |
| <span style="color: orange;">■</span>  | Armed Militants   |
| <span style="color: green;">■</span>   | Islamists         |
| <span style="color: yellow;">■</span>  | Activists         |
| <span style="color: white;">■</span>   | Political Parties |
| <span style="color: cyan;">■</span>    | Workers & Unions  |
| <span style="color: magenta;">■</span> | Civilians         |
| <span style="color: grey;">■</span>    | Other             |

| Graph Elements |      |
|----------------|------|
| Vertices       | 279  |
| Edges          | 1294 |
| Components     | 15   |

Within the main component of the joint action relations network, there are a handful of high-degree hubs, and there are many peripheral vertices with only one or two connections, so there is reason to suspect that the degree distribution is long-tailed. Figure 3.4 shows that it is indeed long-tailed, but not so as to qualify as a power-law. If the network of joint action were scale-free, then the data points in the log-log plot on the right would form more of a straight line. There is thus no need to attempt to fit a power-law distribution or test the plausibility of preferential attachment mechanisms here; it is plainly not a scale-free network.

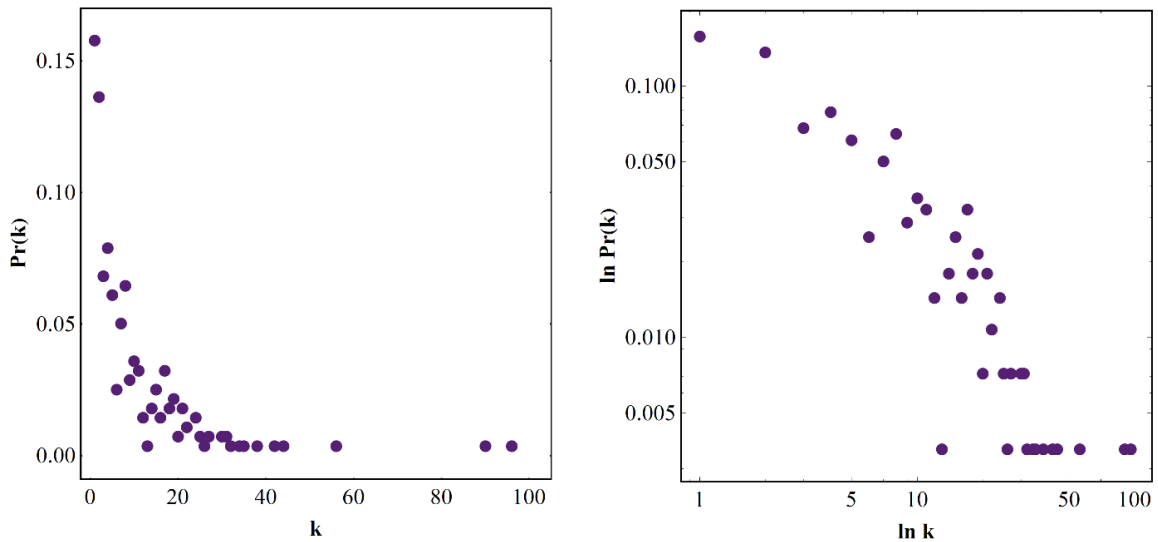
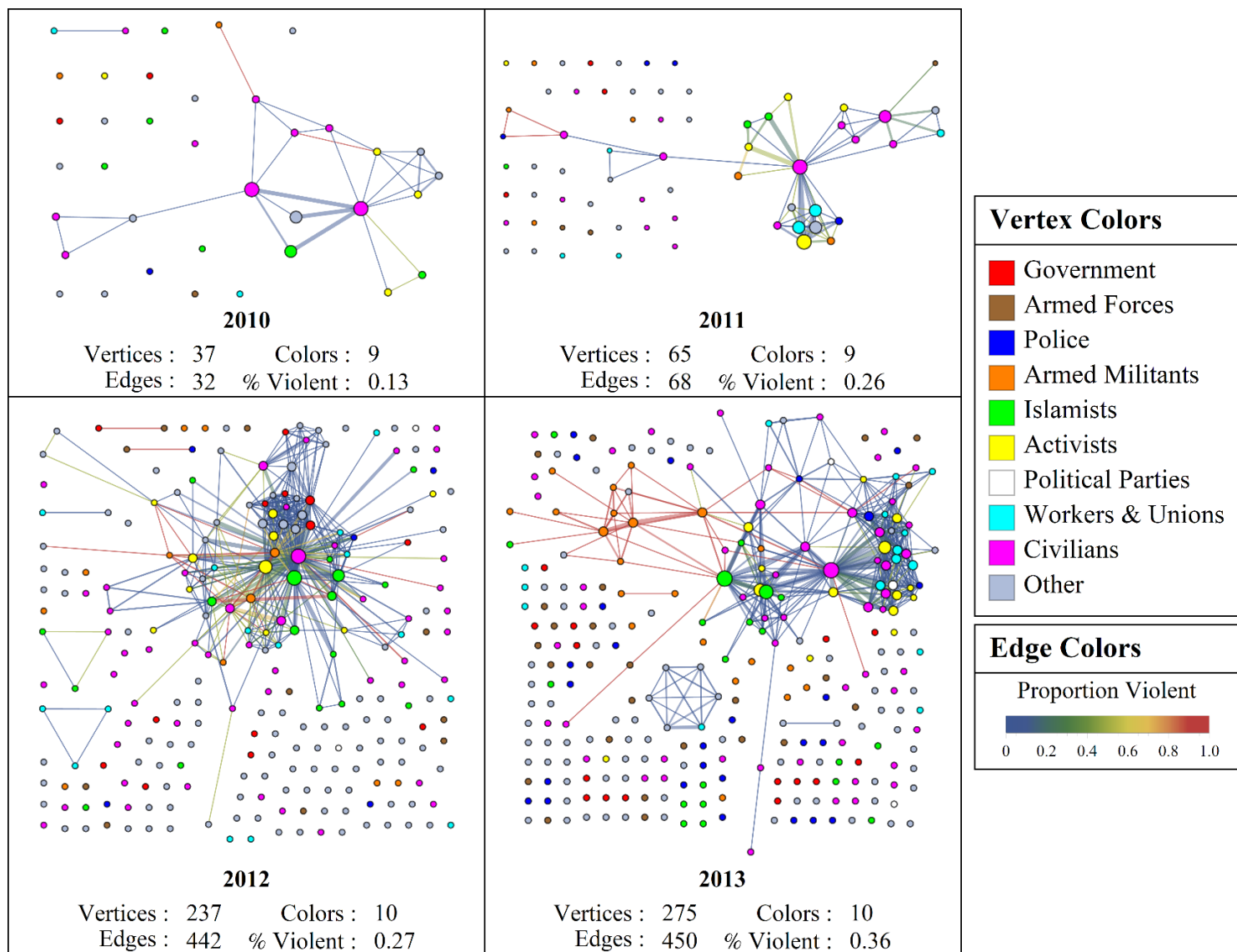


Figure 3.4. Degree distribution for the joint action relations network, 2004-2014 (excluding isolates).

Therefore, other metrics are necessary to assess the level and types of complexity in the structure of joint action relations, and any changes therein. When looking at the annual aggregate joint action relations networks surrounding the campaigns of 2011 and 2013 (figure 3.5), it is apparent that there occurred a change over time similar to that of the contentious relations networks. The graphs for 2012 and 2013 are not only much

larger than those of 2010 and 2011, but also much denser—especially within the largest connected components. Moreover, it is easy to see many closed triads within the main components, which indicates clustering (the other tell-tale sign of a complex network besides scale-free structuring). As the modeled trends will show (e.g., figures 3.8 and 3.9), it is very unusual in Erdős-Rényi graphs to find one large, dense, clustered component surrounded by many isolated vertices (because the probability of edge formation is uniformly distributed across vertices). While isolated vertices were expected by virtue of the construction of joint action relations, it was never obvious that the basic pattern of one giant component surrounded mostly by isolates would be so prevalent in the smaller time windows (see also figure 3.13). This means that the 2010 and 2011 graphs are significantly complex in their own right, and therefore that the difference between the broad context of joint action relations before and after 2012 is not of simplicity-versus-complexity (as it was with some of the subgraphs of contentious relations), but of the particular manifestations of complexity.

Figure 3.5. Joint action relations networks surrounding both major civil resistance campaigns, by year (next page).



The complexity dynamics within joint action relations networks can be interrogated by tracking the trends by month throughout the 2004-2014 period. Figures 3.6 and 3.7 show that there was a clear inflection point in 2012 in terms of the number of elements within the networks of joint action. Looking closer at figure 3.6, it is evident that the January 25, 2011 campaign reflects a pattern of past waves of contention—namely, short-term spikes in joint action relations over and above the number of contentious events. The number of relations began to reach unprecedented heights in early 2012, dramatically peaking in late 2012 and early 2013—when opposition began to mount against President Morsi. Interestingly, during the June 30, 2013 campaign, the pattern of previous waves of contention flipped, such that the count of contentious events far outnumbered the count of joint action relations.

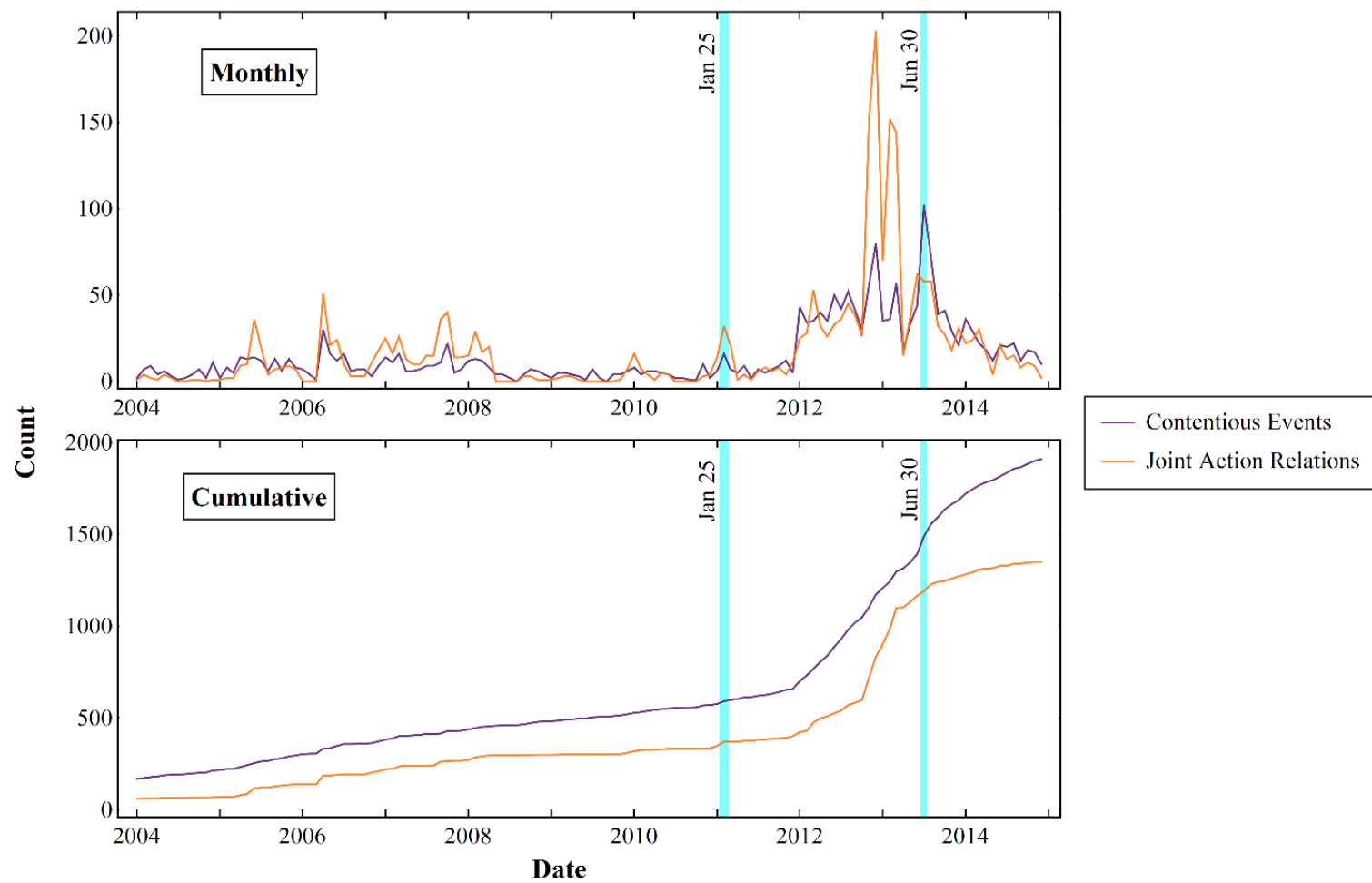


Figure 3.6. Contentious events and joint action relations over time.



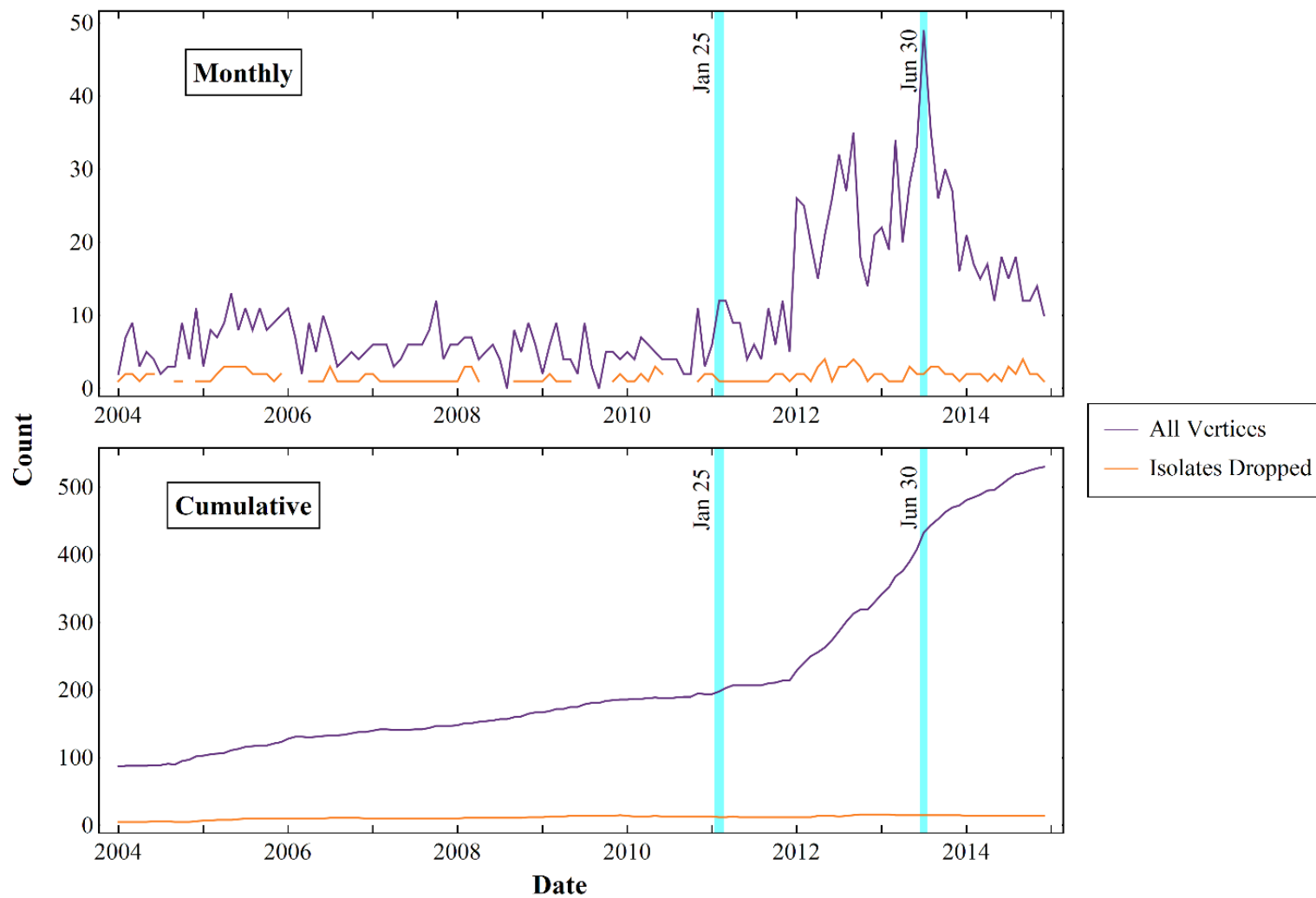


Figure 3.7. Connected components in the joint action relations networks over time.

Meanwhile, figure 3.7 shows that the count of connected components reached its highest point during the 2013 campaign. However, the rise in connected components is almost entirely explained by the count of isolated vertices, which signifies a marked decrease in the number of joint action relations compared to the potential maximum. When the isolates are dropped from the count of connected components, the trend is rather flat over time; there are only ever a handful of connected components at most. The pattern first noted with the aggregate network of joint action is thus quite clear over time, and its rarity in Erdős-Rényi graphs is measurable with cyclomatic number—the baseline metric for graph complexity. Figure 3.8 shows that almost every observed network of joint action has a statistically significantly high cyclomatic number, which was not the case for the contentious relations networks. This is firm evidence that virtually all networks of joint action bear significant baseline complexity. It is worth noting that the cyclomatic number for the contentious relations networks also peaked at the end of 2012, and that was one of the few times the value for the cumulative network was statistically significant (figure 2.7). It was mentioned above that the peak occurred when the opposition to President Morsi kicked off, and the implications of that will be discussed in section 3.6. For now, the key point is that the joint action relations networks became far more complex (in terms of their distinguishable elements) after the 2011 campaign.

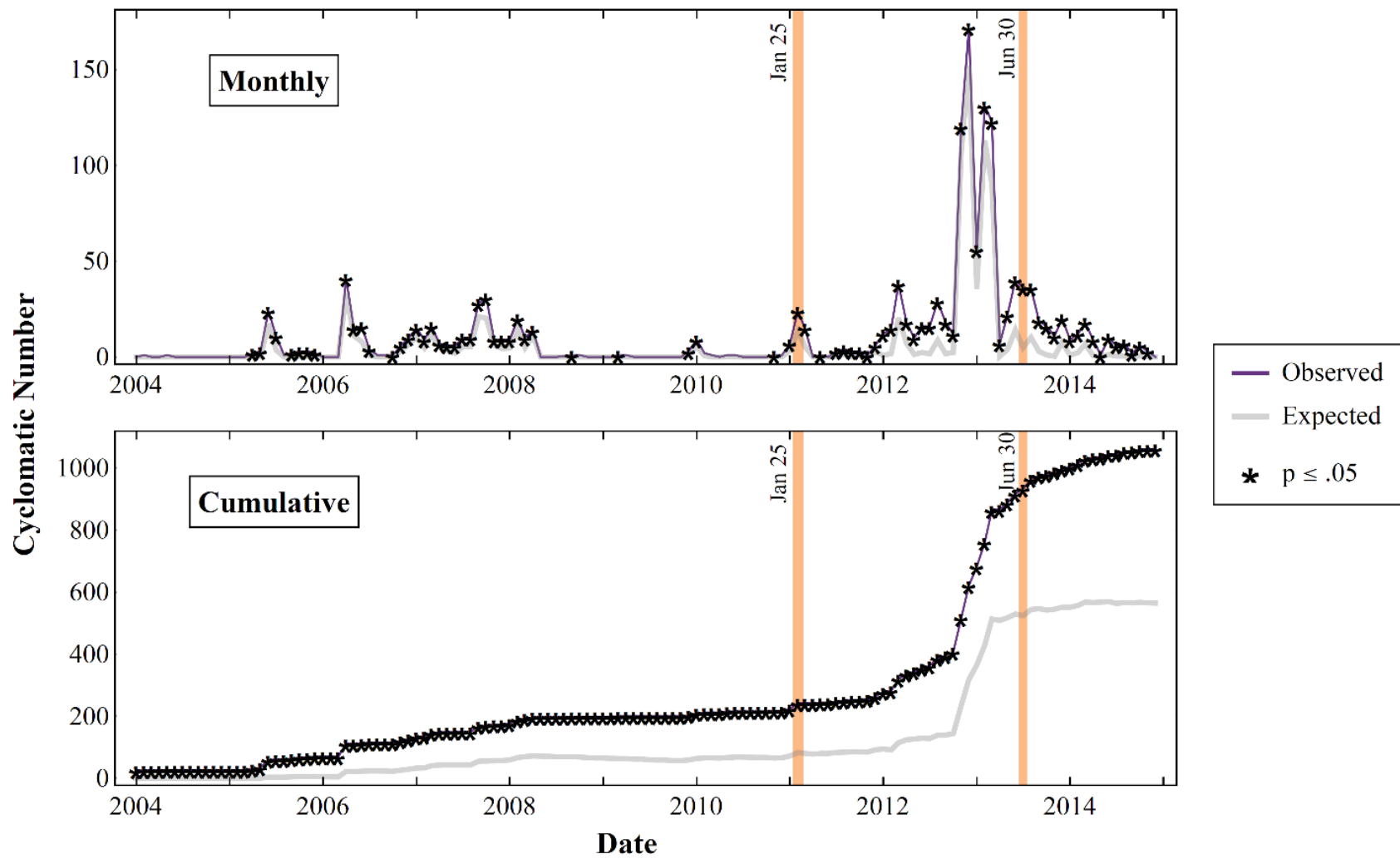


Figure 3.8. Cyclomatic numbers in joint action relations networks over time.

Knowing that there is a pattern of one large component surrounded by a few much smaller components and many isolated vertices, it is beneficial to standardize the size of the largest component by the proportion of vertices it contains (i.e., the extent of percolation) and track that quantity over time to see how persistent the pattern is (figure 3.9). Notice that the pattern is not ubiquitous, as there are months (mostly before 2011) when there were either no joint action relations at all or the size of the largest component was statistically normal among random graphs. The cumulative graphs, however, are quite steady over time. For both the discrete monthly graphs and the cumulative graphs, when the observed values are statistically significant, they are all lower than expected. This means that given the same number of vertices and edges, much greater percolation is expected than is in fact observed. There are local upticks in main component size during both major civil resistance campaigns, but neither included a simple majority of vertices. It is difficult to discern a strong pattern here, but there are two features that stand out: the relative size of the main component was larger in 2011 than it was in 2013; and the lowest statistically significant values came shortly after the 2013 campaign. These are subtle points, but they add informative texture to the prior observations about baseline complexity.

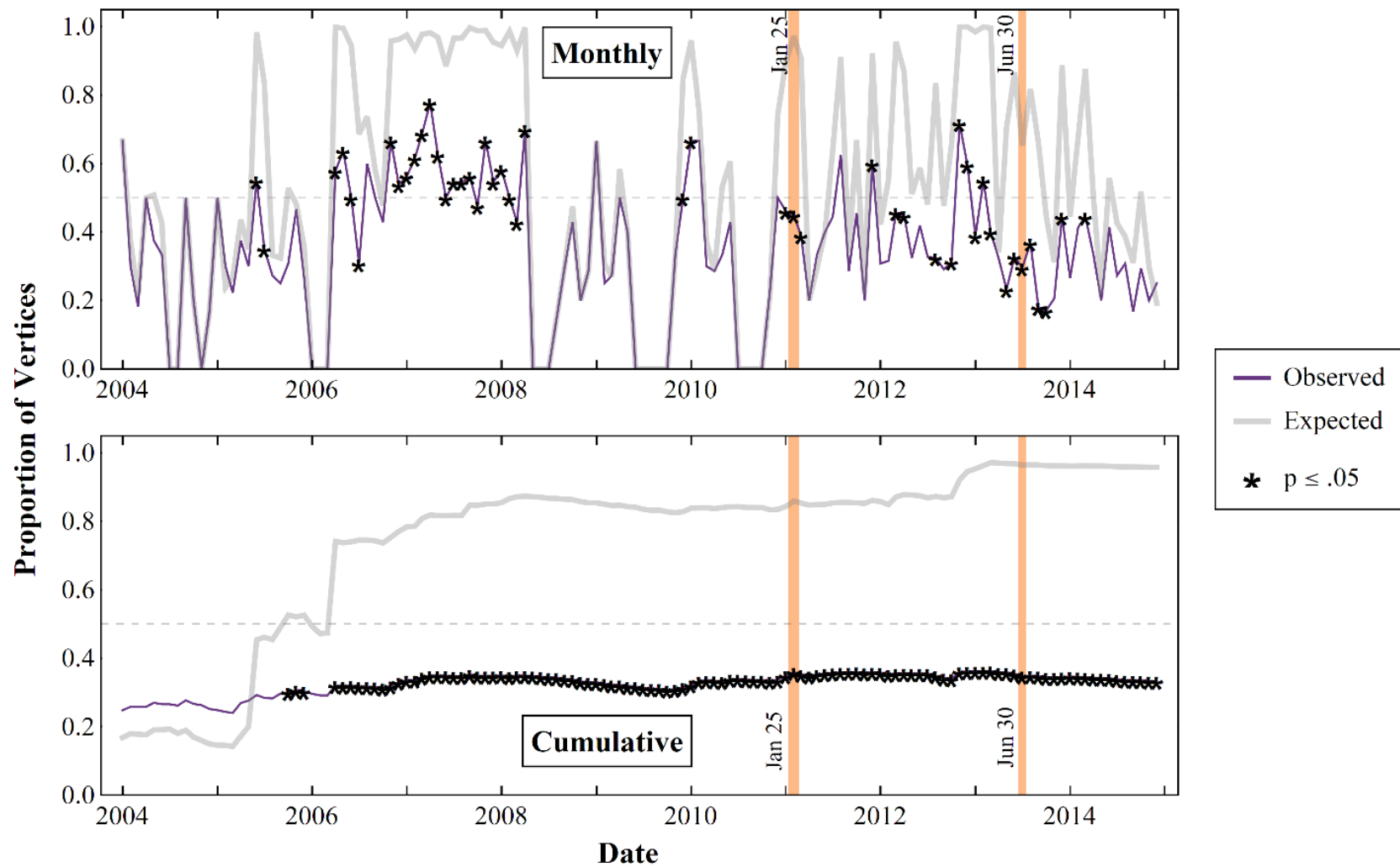


Figure 3.9. Proportion of vertices in the main component of joint action relations networks over time.

The clustering metrics presented in figures 3.10 and 3.11 similarly support the claim that the structure of joint action relations is consistently complex—in the sense that it is very unlikely to occur at random. The monthly values vary rather widely over time, so the cumulative values are needed to spot differences in the trends surrounding the two campaigns. Near both instances, the coefficient ratcheted upward amidst a wider downward trend, but with the 2013 campaign, this movement was much more dramatic and happened several months before the campaign. Both instances occurred during rises in contention, so this suggests that many of the new relations were forming closed triads in early 2011 and late 2012. But the new relations of mid-2013 were contributing less to the global clustering in the wake of the peak in early 2013. The observations for average shortest path length follow suit. Amidst remarkably short paths in the largest components throughout, the monthly values reached a peak in mid-2013 as the clustering coefficient dipped.

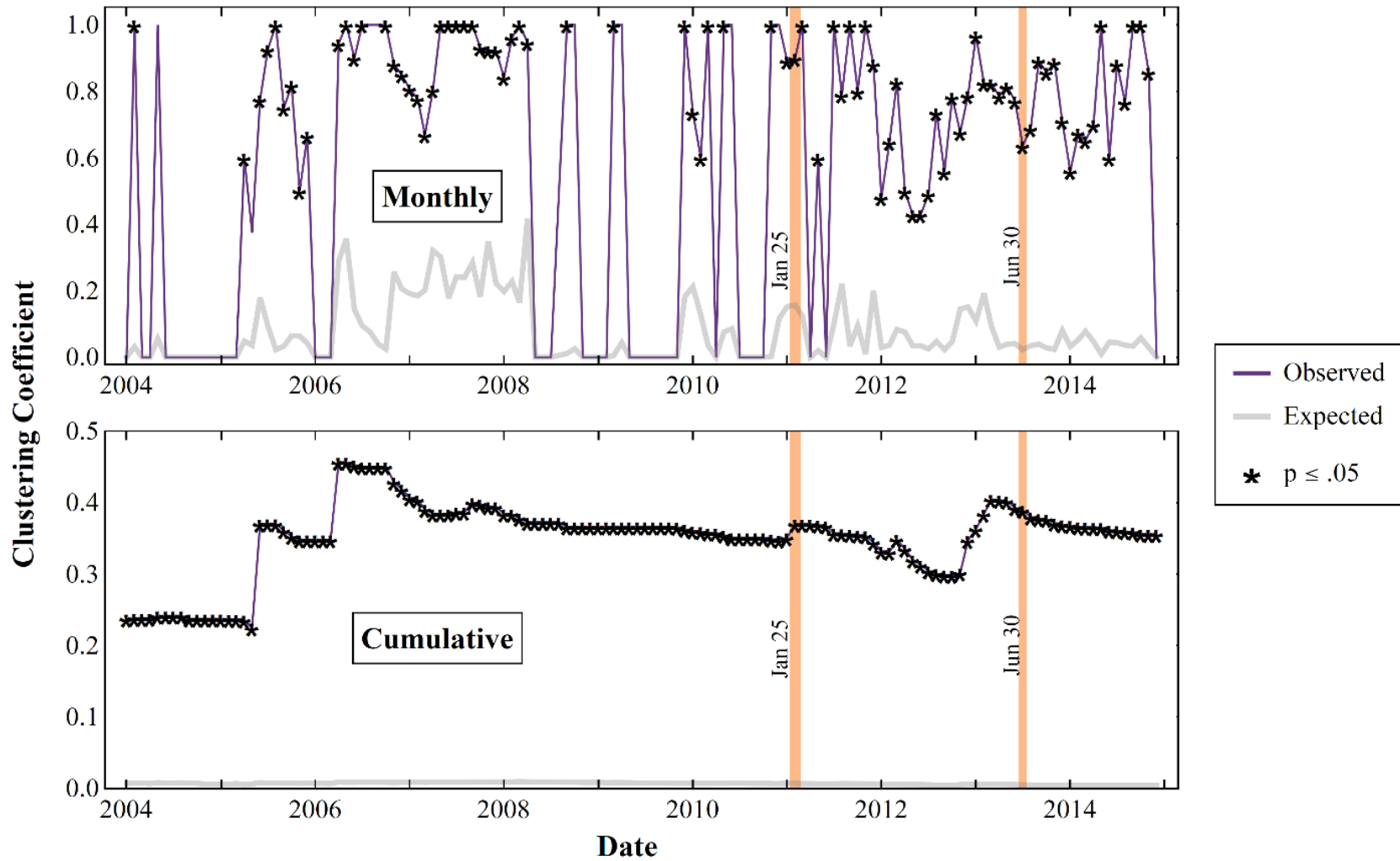


Figure 3.10. Global clustering in joint action relations networks over time.

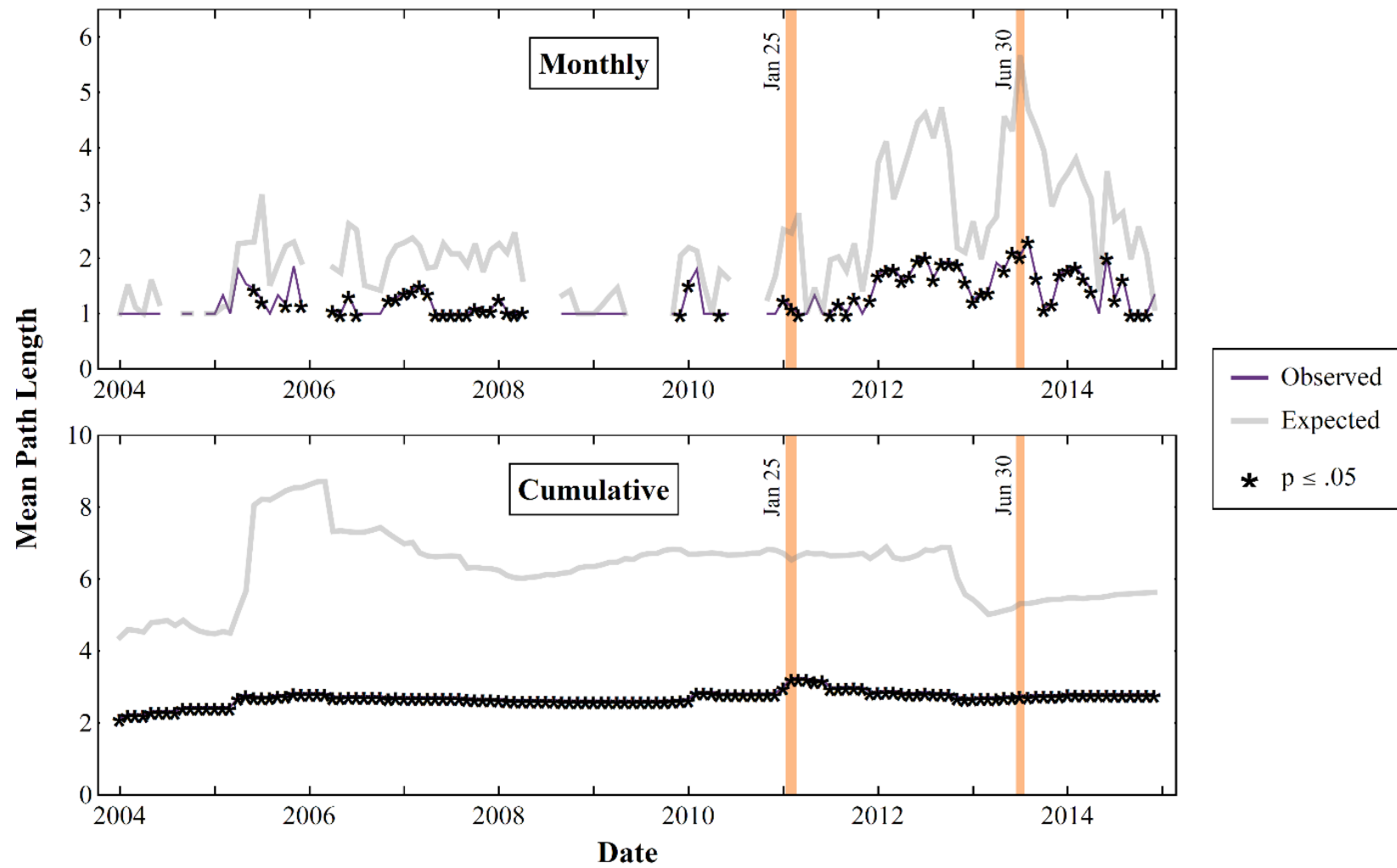


Figure 3.11. Average shortest path lengths for joint action relations networks (main components) over time.



Finally, given that the sink variants of star-like motifs in contentious relations produce cliques in joint action relations, and that the clustering coefficient reached the maximum in some months, it is time to move beyond triads to examine trends in the size of maximal cliques (figure 3.12). As anticipated, there are often rather large cliques, and every value larger than four is statistically significant, which leaves no doubt as to the complexity of the joint action relations networks. The single largest clique emerged in late 2012, coinciding with spikes in cyclomatic number, main component size, and clustering. In other words, this is the point in time when the network of joint action was its most complex. There were indeed relative increases in clique size (among other statistically unusual structural features) right around each major campaign, but the second campaign came a few months after the network reached peak complexity. The meaning of this fact is interpreted in light of the ongoing theory-building of the dissertation in the section 3.6, but first it is important to learn whether these structural properties carry with them any meaningful changes in the substantive properties of vertices and edges within the networks. In particular, it must be determined whether the two major campaigns are distinguishable in other ways.

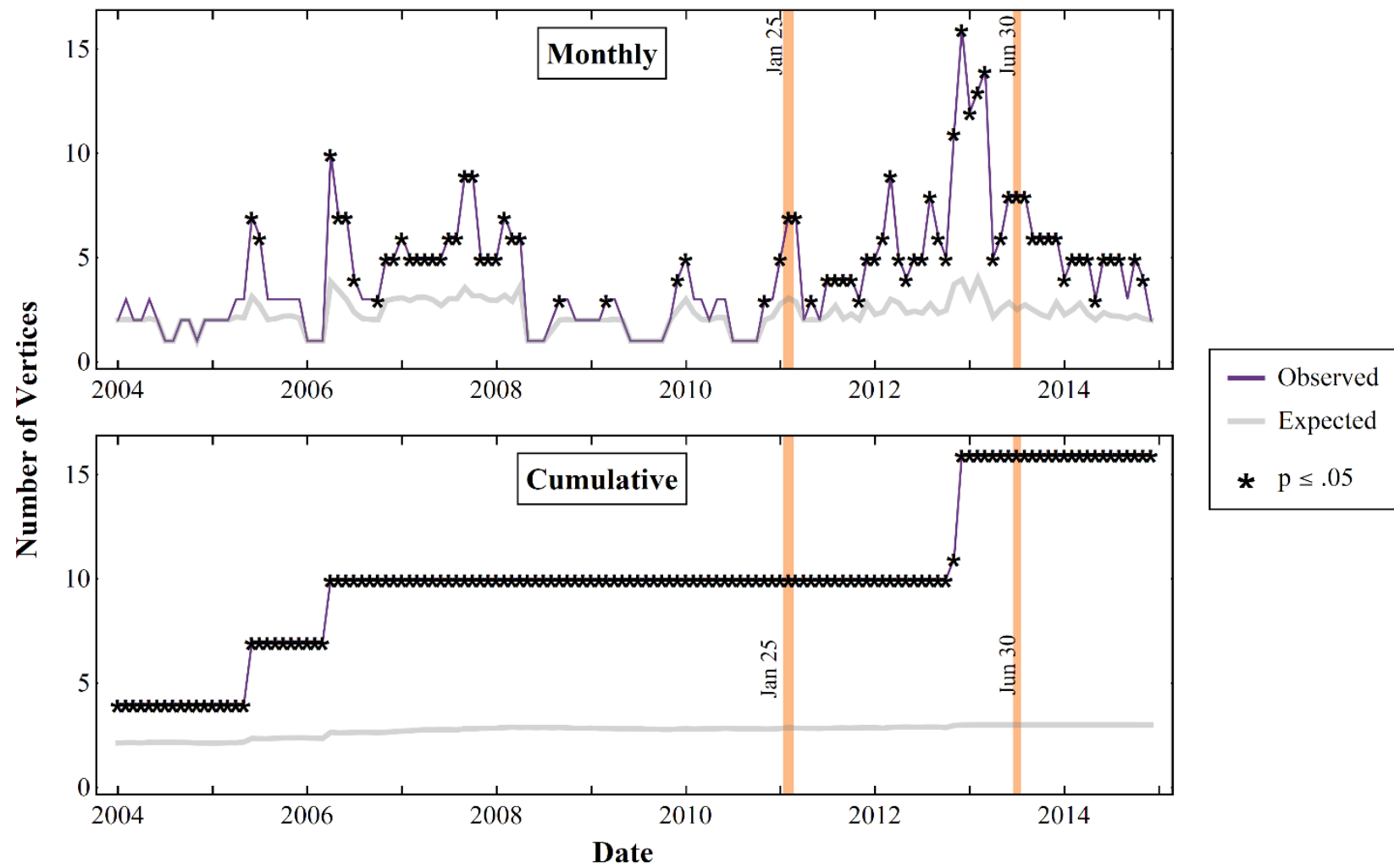


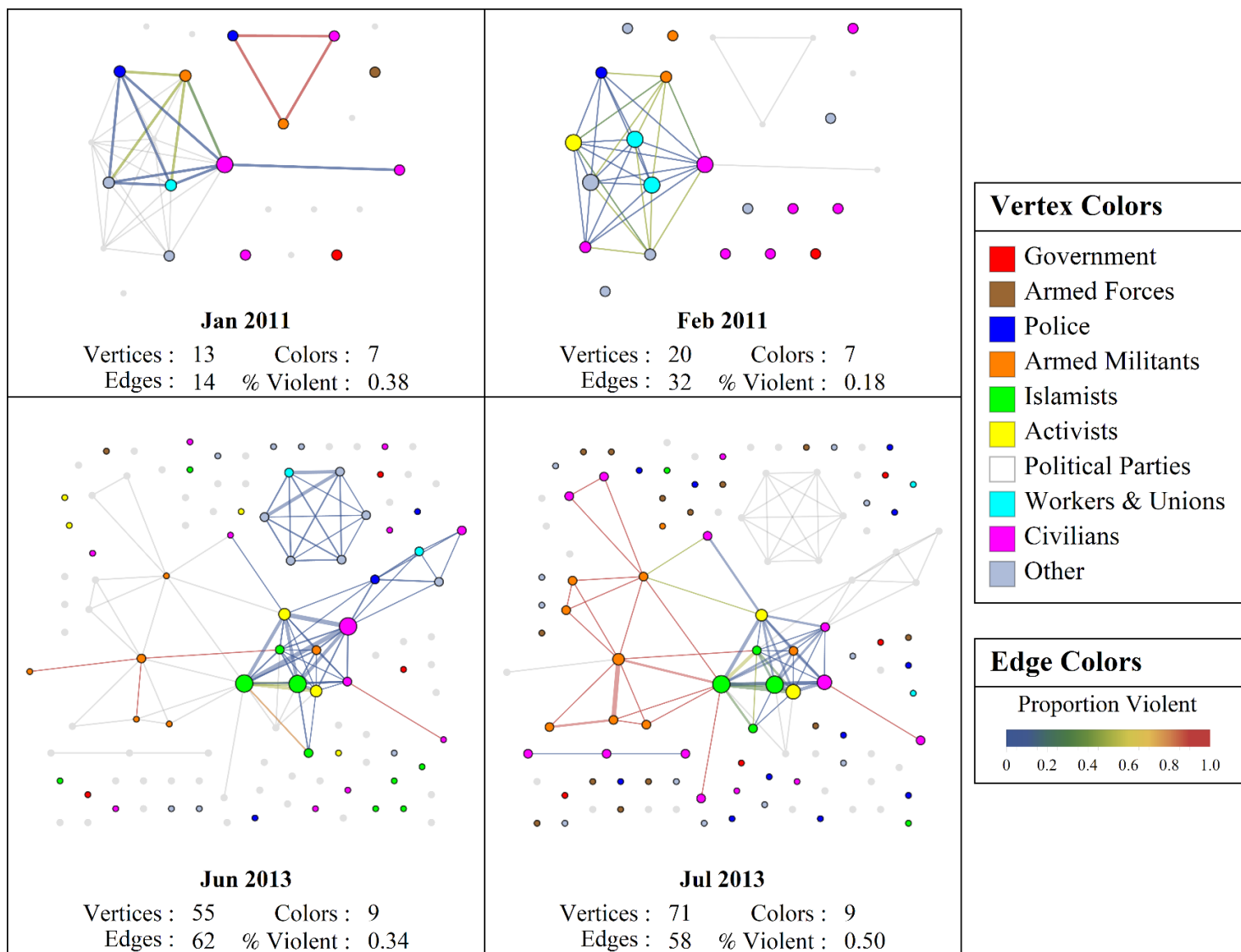
Figure 3.12. Size of the maximal clique in joint action relations networks over time.

### 3.5.2 Substantive Dynamics and Relational Volatility

In this subsection, the networks of joint action are examined for patterns in the identity categories assigned to vertices, the proportion of violent actions underlying joint action relations, and the novelty and persistence of edges over time. The network diagrams presented here zoom into the context immediately surrounding the January 25, 2011 and June 30, 2013 campaigns, concretizing the structural observations from the previous subsection, while also enabling comparison of similar structural forms by their embedded attributes.

Beginning with monthly graphs for the two campaigns (figure 3.13), it is evident that each graph is structurally a microcosm of its respective yearly graph (figure 3.5). The 2011 campaign was characterized by one relatively small but dense core cluster, while the 2013 campaign involved a larger main component with a dense core and a marked periphery. The cores at both times contained a variety of vertex colors, but whereas both included civilians and activists in central positions, only the latter contained Islamists as distinguished entities in the core cluster. For this point, recall that vertex colors are mutually exclusive by definition, but the original identifications of entities represented by distinct vertices are not. This means that Islamists are identified as distinct entities when they acted as distinct entities in the field of contention (as is true for all other entities). And the fact that there are joint action relations between Islamists and other entities means that the demographic polarization that occurred leading up to President Morsi's ouster in July 2013 did not result in a total bifurcation of cooperative relations by identity categories. It was more complicated than that.

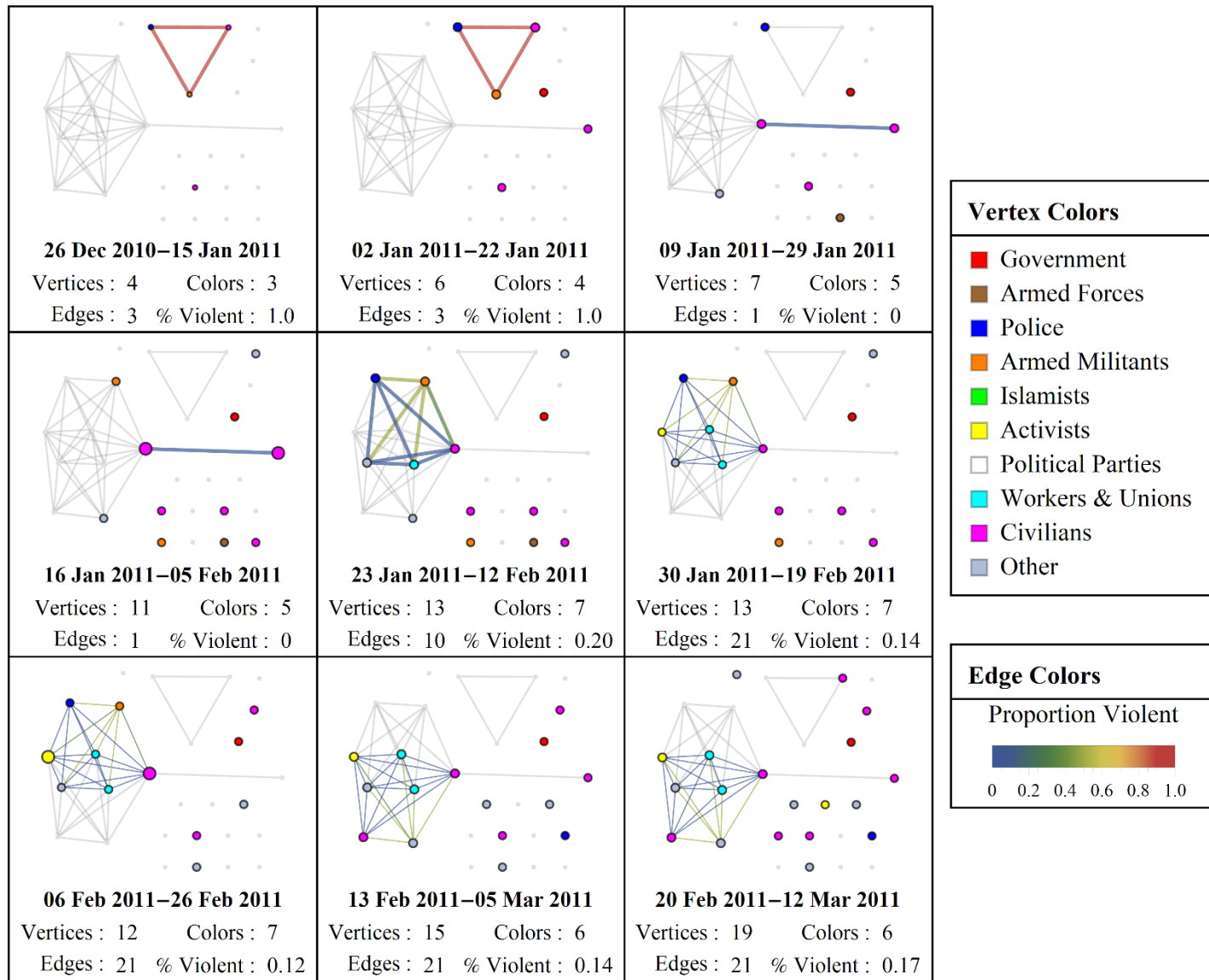
Figure 3.13. Joint action relations networks surrounding both major campaigns, by month (next page).



As with the networks of contention, there are noteworthy contrasts in the proportion and structural position of violent underpinnings to joint action relations. The overall proportion of violence in January 2011 is about the same as that of June 2013. But notice that the violent relations in January 2011 were mostly isolated from the main component, whereas in June and July 2013, all of the violent relations were contained within the main component. Also notice that in February 2011, the proportion of violent relations dropped, whereas it spiked during July 2013. Amidst both campaigns, it is clear that the violent action involved armed militants, but during the 2013 campaign there was a much more prominent radical flank. While this repeats the pattern from the contentious relations, and it is understandable as a result, remember that it would only take a slight modification to the concatenation of contentious relations to sever the radical flank from the main component in 2013.

More to the point, when zooming in as close as possible, to the three-week windows during both campaigns (figures 3.14 and 3.15), one can see that the isolated triad of violent joint action relations in January 2011 concluded before the campaign began on January 25. There were other violent actions underlying the core cluster during the campaign—more so at the beginning. The process was reversed for the 2013 campaign. The proportion of violence underlying the joint actions was relatively low in early June 2013 and then increased as the campaign unfolded in late June and early July—nearly reaching a majority right in the middle of the campaign.

Figure 3.14. Joint action relations networks surrounding the January 2011 campaign, by 3-week moving window (next page).





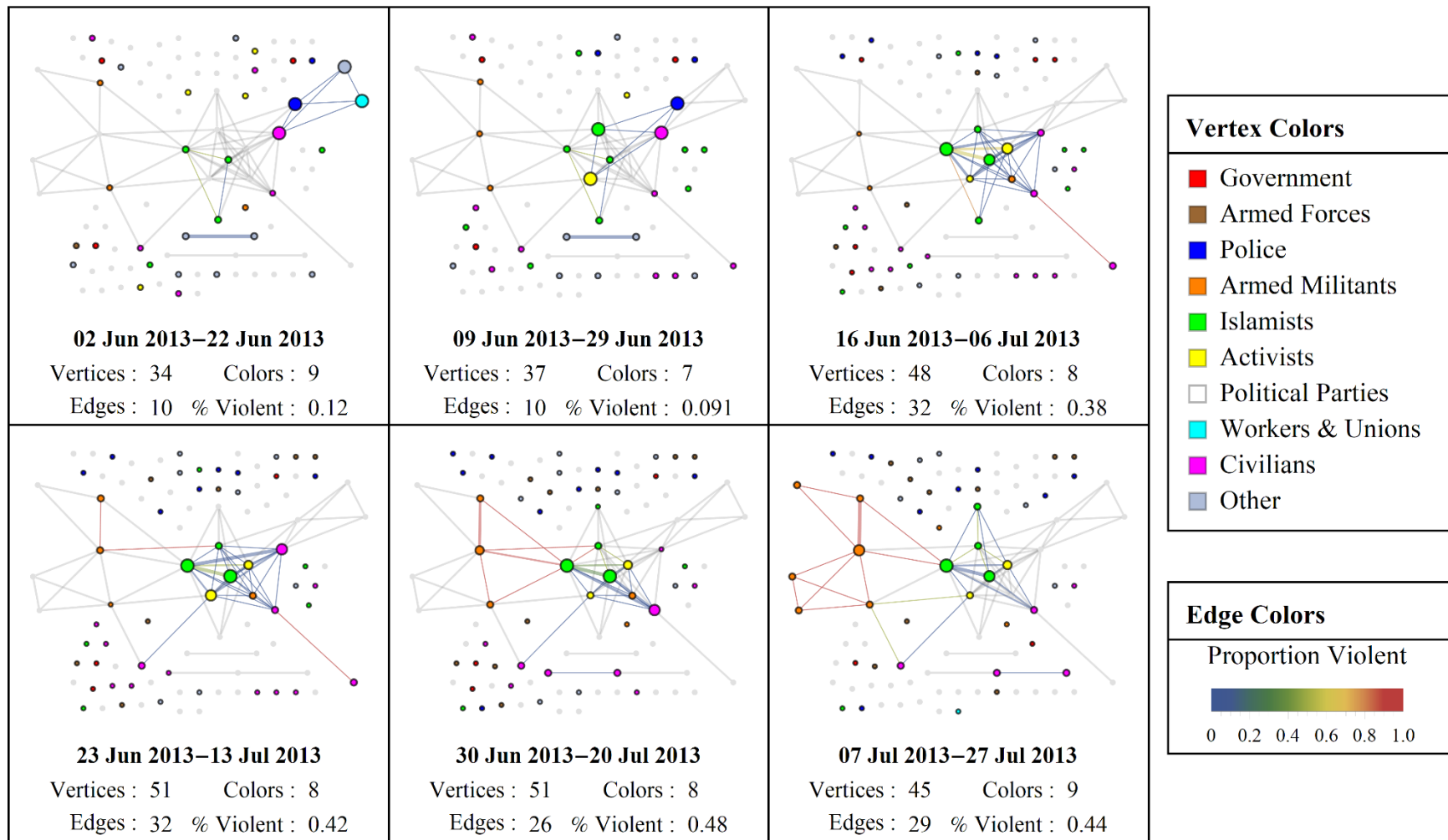


Figure 3.15. Joint action relations networks surrounding the June 2013 campaign, by 3-week moving window.

Now, it is worth pausing for a moment to remember that the locus of observation is the proportion of events labeled as violent, and not the magnitude of violence amidst all contentious action, as might be measured by individual participants or casualties. Unfortunately, the SCAD records for Egypt do not contain enough consistent information on event participation or lethality to weight either violent or nonviolent events by their magnitude. Therefore, what the available data provide are details about the nature and dynamics of joint action in the Egyptian field of contention, as opposed to blanket statements about the prevalence of violence as such. That said, the fact that the less successful civil resistance campaign (2013) was surrounded by a higher proportion of violent relations is notable.<sup>31</sup>

The substantive differences in the joint action relations networks surrounding the two campaigns are further highlighted with the color-reduced weighted adjacency matrices (figure 3.16). These plots show the relative proportion of joint action relations among the identity categories, including within-category relations on the diagonal.<sup>32</sup> The data show that Islamist vertices are absent in 2011 but central in 2013. It is also apparent that civilian vertices carried more weight during the first campaign than they did during the second campaign. And finally, the diagonal cells are much more populated in the latter than the former.

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<sup>31</sup> See the Appendix for available data on participation, lethality, and proportions of violence among both contentious and joint action relations.

<sup>32</sup> Because joint action relations are undirected, the matrices are symmetrical across the diagonal—meaning the lower left and upper right triangles are mirror images of one another. The adjacency matrices in Chapter 2, by contrast, were asymmetrical because contentious relations are directed.

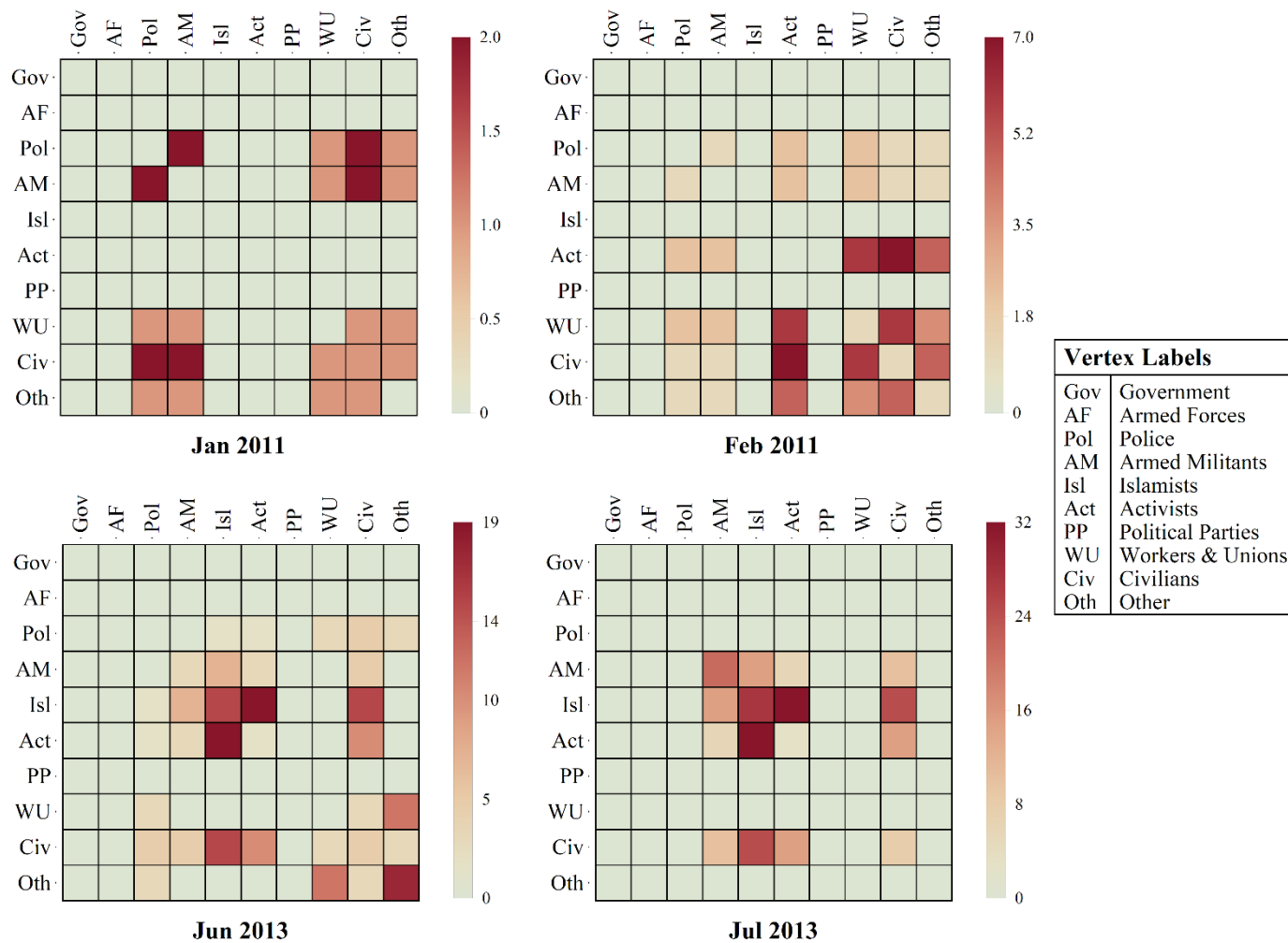


Figure 3.16. Weighted adjacency matrices for joint action relations among categorized vertices surrounding both major campaigns, by month.

The comparison of diagonal to off-diagonal weights in the adjacency matrices can be summarized by computing graph assortativity by vertex color—that is, the Pearson correlation of vertex color within all joint action relations at a given time. Figure 3.17 shows that the monthly networks of joint action were disassortative by vertex color during the 2011 campaign, but assortative during the 2013 campaign. It also shows that the assortativity coefficient in the cumulative networks leading up to and carrying through 2011 hovered around the origin (meaning no correlation by vertex color), and then began to trend upward in late 2012. This means that identity category became an increasingly salient factor for joint action after the 2011 campaign. However, it is also noteworthy that the monthly graphs swung between assortative and disassortative multiple times from early 2012 onward, as it indicates fluctuations in the character of joint action relations despite relatively consistent structural motifs. This leads, finally, to measurements of the volatility of joint action relations directly.

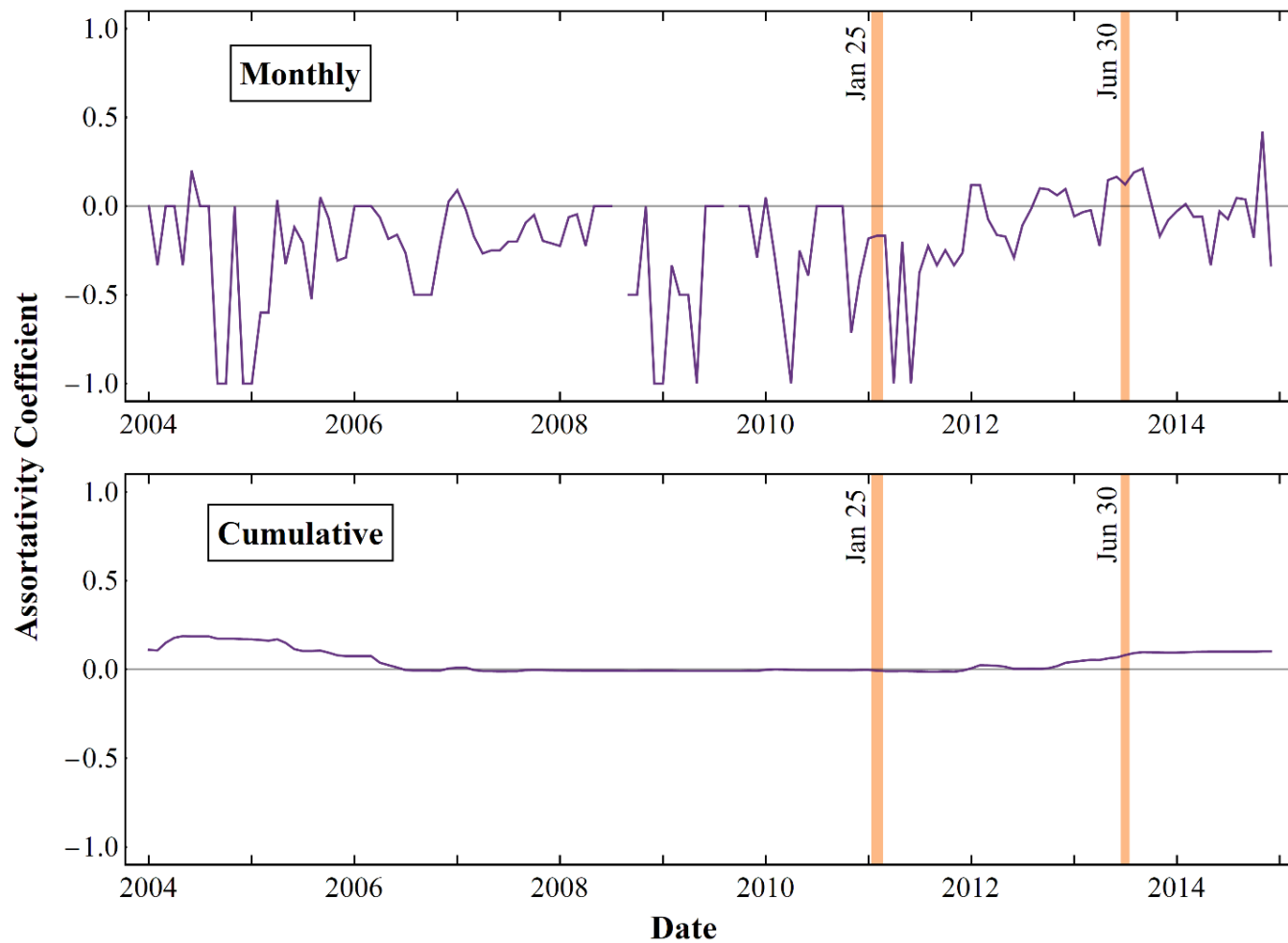


Figure 3.17. Assortative mixing by vertex color (entity category) in the joint action relations networks over time.

The two measures of relational volatility are novelty (the proportion of edges in a given monthly graph that are appearing for the first time since observation began in 1990) and persistence (the proportion of edges in a given monthly graph that also appeared in the monthly graph immediately prior). Figure 3.18 demonstrates that novelty values tend to be high and persistence values tend to be low, which indicates a high degree of volatility in joint action relations overall. The 2011 campaign defied the overall trend somewhat, seeing novelty fall below and persistence rise above the half-mark during its span. The 2013 campaign, by contrast, arose amidst a high proportion of newly forming relations, and though it emerged during a local uptick in persistence, it was still surrounded by a minority portion of persisting relations. There are many fluctuations in both metrics in the period between the campaigns, and it is difficult to attach significance to any one of them without scrutinizing the monthly graphs in that period. Therefore, the take-away points should be limited to the overarching trend—namely, high volatility despite relative consistency in clustered-core structural pattern—and to the stark contrast between the two campaigns—namely, that the 2011 campaign occurred amidst relative stability while the 2013 campaign occurred amidst trend-consistent volatility.

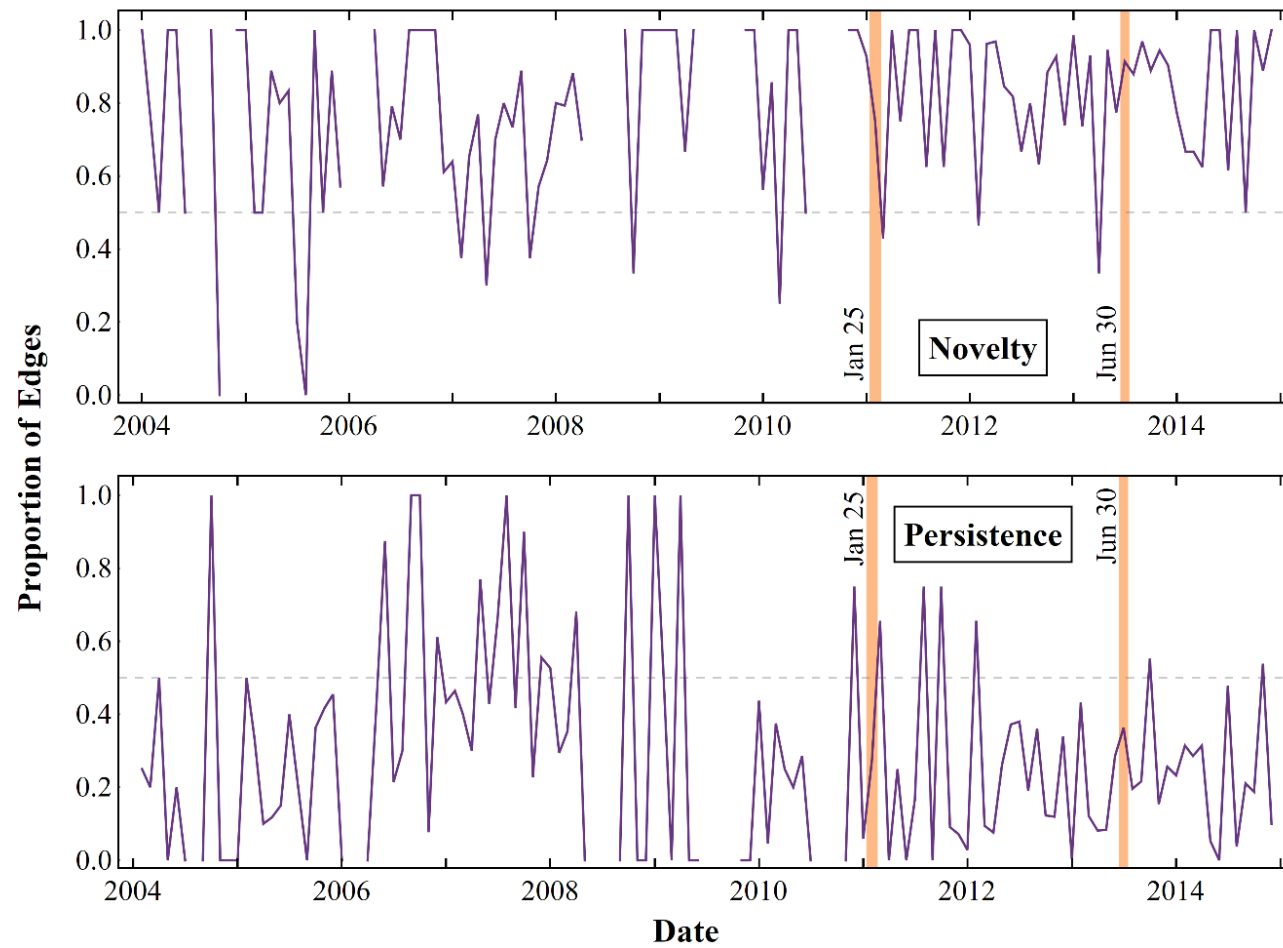


Figure 3.18. Volatility in joint action relations networks by month, as measured by the proportion of edges occurring for the first time ever in a given month (top) and the proportion of edges in a given month persisting from the prior month (bottom).

### 3.6 Discussion

Bringing a fresh perspective to a phenomenon has both advantages and disadvantages. While almost everything observed through a new lens adds to the stock of knowledge, what is seen for the first time is often difficult to interpret and integrate into what is understood from existing frames of reference. And then as the necessary connections are made to learn from the latest acquisitions, the tendency is to generate more questions than answers. Underlying the novel analyses above is a commitment to reach some resolution with regard to the guiding question for the chapter: *what patterns in the joint action relations help explain the differences in civil resistance efficacy between the two major civil resistance campaigns in Egypt?* The task of answering a very similar question in the previous chapter yielded many insights related to the two main points about complexity and segmentation in the networks of contention. Now, with the networks of joint action, there is strong evidence for a further developed understanding of complexity, as well as an added lesson about the volatility of joint action during Egypt's contentious political transition. These findings first register as support for the claim that joint action relations, though they are derived from contentious relations, expose patterns in the context of civil resistance that were obfuscated in the direct analyses of networks of contention. More importantly, the evident dynamics in the structure of joint action relations advance the ongoing theory-building for the efficacy of civil resistance to a resting point. There are, of course, plenty of questions remaining to fuel more research on the subject, but discussion of those is reserved for the dissertation's conclusion. In the meantime, this section completes the chapter by assimilating its key findings into the



previous chapter's discussion of the influence of relational context on the outcomes of civil resistance campaigns.

Before proceeding with the theory-building, it is worth taking a moment to appreciate the overarching fact that there is extraordinary complexity in the structure of both contentious and joint action relations in Egypt. After all of the detailed analyses, it could be taken for granted that these networks have important structural properties, but the prior research on contentious action—let alone civil resistance—has not suggested that should be the case. As outlined in the setup for these analyses in Chapter 2, the application of network methods and imagery in the social movements and contentious politics literature has concerned interpersonal, interorganizational, and socio-political affiliation ties, in order to understand such features as participation, tactical diffusion, brokerage, and coalition formation (e.g., Baldassarri and Diani 2007; Gould 1991, 1993; McAdam and Paulsen 1993; Melucci 1989; Mische 2008; Tilly 1995, 2006; Wang and Soule 2012). Given how well established relational thinking is in the literature on social conflict and contentious politics (see Kriesberg and Dayton 2017; McAdam, et al. 2001; Mische 2011), it is surprising that there are to-date no comparable networks derived from conflict events to reference in this study of the Egyptian case. The compulsion to construct the networks presented above arose because the case narrative in Chapter 1 lacked details about the dynamics of the Egyptian field of contention. But there was no way of knowing from the outset that transforming the list of events given in SCAD would reveal such fascinating networks. It is of course possible that the structural features of the Egyptian networks of contention and joint action are unique, but the interpretation of them within the Simmelian-relational framework justifies a hypothesis that they are not.

While this dissertation remains focused on explaining the outcomes of civil resistance in Egypt, it would be a mistake to conclude the analyses without emphasizing that the complex structuring of both contentious and joint action relations is a remarkable finding in its own right.

Moving on to the implications for civil resistance efficacy, first recall the conceptual bases of joint action relations. Each joint action relation represents an alignment between actors engaged in conflict. Conflict, in this case, was recorded in distinct events involving unrestricted identifications of actors and targets, based on reports in international newswires. The original actor identifications were retained with minimal revision, which means the entities in joint action relations are diverse in form (i.e., inclusive of individuals, named organizations, governing bodies, and categorized collectivities) and not necessarily mutually exclusive. The concatenation of joint action relations represents the structure of alignments (and lack thereof) among these morphologically varied entities in their capacity as actors engaged in conflict. The theorizing can only proceed with these qualifications in mind, which requires a bit more finesse than the contentious relations did.

The issue is how exactly joint action as defined relates to the theorized mechanisms by which civil resistance prefigures democracy. The mechanisms, once again, are: (1) fostering inclusive and proactive political participation; (2) organizing civil society; (3) establishing civilian checks on state authority; (4) implementing procedures for nonviolent conflict management; and (5) instituting practices of egalitarian self-governance. Although the broad concept of cooperation pertains to all of the above, joint action as measured here pertains mainly to the first.

It was previously indicated that the literature on nonviolent action addresses relationality primarily in terms of the importance of organizing large, civilian-based campaigns (e.g., Ackerman and Kruegler 1994; Chenoweth and Stephan 2011; Nepstad 2011a; Schock 2005; Sharp 1973, 2005). This point is embraced in the first mechanism, which suggests that if a civil resistance campaign is to advance democratization in the wider society, then how well it represents the surrounding social demographics is just as important as its size and organization. With the data on joint action relations, supplementary data to that point is obtained. Although direct information about coalition formation during Egypt's two major campaigns is lacking at present, there is detailed information about the implicit alignments of actors within the wider field of contention before, during, and after the campaigns. Between the network diagrams, the color-reduced adjacency matrices, and the trends in assortativity by vertex color, there is strong evidence that entities in the Egyptian field tended to align more within identity categories during the 2013 campaign than during the 2011 campaign. This is not proof positive that the 2011 campaign caused the diverse alignments or the nascent democratization that followed, but it does permit the negative conclusion that the first mechanism fell well short of its ideal-typical form during the 2013 campaign. Or stated more plainly, it is evidently plausible that the 2011 campaign fostered inclusive political participation as theorized, but the 2013 campaign certainly did not.

As much as the importance of the first mechanism has been emphasized throughout this dissertation, it is posited as a necessary but individually insufficient condition for the long-term efficacy of civil resistance (see Mackie 1965). The amount of space dedicated to it owes to the need for corrective argumentation in light of the extant

literature, and to the available data for the Egyptian case. All five mechanisms are unequivocally presented as individually necessary and collectively sufficient insofar as they sync up and reinforce one another, regardless of the volume of data and discussion pertaining to each. Moreover, “sufficient” in the present theorizing refers to the positive contribution of civil resistance to democratization on top of immediate objectives like ousting an autocratic ruler; it does not imply that ideal-typical civil resistance will certainly produce democracy, because there are other factors that affect the prefiguration of democracy.

In particular, striking differences in the structure of contentious and joint action relations surrounding the two Egyptian campaigns have been observed. It was previously theorized that the first two mechanisms of civil resistance are most effective in advancing democratization when embedded in a wider structural motif that exemplifies people power—that is, a situation in which diverse actors target undemocratic entities with little or no cross-conflict. Such star-like motifs in networks of contention produce cliques in networks of joint action, which are bear a level of complexity in their own right. It has been shown that indeed the networks of joint action were complex at nearly all times, including the times when the networks of contention were simple.

While the conclusions drawn about the rise in complexity among contentious relations were rather loosely associated with the years 2012 and 2013, the evidence from the analyses of joint action relations highlights rises immediately surrounding each major campaign (more so for the second), as well as a burst of extraordinary complexity between November 2012 and January 2013. Recall from the narrative of Chapter 1 that this period was immediately preceded by violent conflict between challengers to and

supporters of President Morsi in October 2012. Morsi announced his assumption of greater executive privileges in November 2012, and then the Muslim-Brotherhood-backed constitutional referendum was approved the following month. The National Salvation Front formed shortly thereafter and launched a new sit-in in Tahrir Square on the second anniversary of the January 25, 2011 uprising. The *Tamarod* initiative, which began in late April 2013, is largely credited with mounting the June 30 campaign that brought Morsi down, but Chapter 1 hinted that Morsi's downfall really began when the National Salvation Front formed a few months earlier. Chapter 2 further theorized that the evolution of relational complexity in a field of contention makes nascent governments vulnerable, thereby opening opportunities for civil resistance campaigns to mobilize and challenge the rulers, while simultaneously creating obstacles for democratic development and consolidation. The issue, in short, is that tangled webs of contention are problematic for democratic prefiguration, even though they may increase opportunities for dramatic short-term gains. And now, with the observation that the networks of joint action were most complex concomitant with the demise of Egypt's nascent democracy, the argument gains a second leg.

The proposal now is that more complex structures of joint action relations indicate that the field is less amenable to the kind of political alignment that is necessary to establish a sustainable democracy. This is somewhat counter-intuitive, as complexity among joint action relations was manifested in highly clustered core components, and there is a tendency to associate network cohesion of this sort with social strength. However, joint action relations derive from contentious acts, in which actors are identified relative to their contentious relations. When there is an increase in the number

of joint action relations, it means there are more distinguished entities in play. Given that the criteria for actor identification are flexible enough to allow any social entities, ranging from named individuals to categories as general as “citizens,” the density of networks of joint action indicates cohesion in a sense, but also differential positioning in another sense. As discussed above, it depends in large part on the substantive qualities of the network. The point now is that one should also consider the relative degree of complexity when evaluating the role of apparent cohesion in a network of joint action. More graph elements, a larger primary subfield, more transitivity in relations, more indirect connections, and larger cliques: these features in conjunction make it immensely difficult to comprehend the structure of joint action relations at any one time, let alone as the network changes over time. And compounding the complex structure is the volatility of joint action relations: when most relations are either brand new or recently inconsistent, having a handle on the complex structure of relations would not be of much help as one attempts to prefigure democracy with specific actors through specific pathways. The data on joint action relations provide only one angle on cooperative relationality, but the historical timing and the statistical significance of the observed increases in complexity make it reasonable to infer that the patterns observed in the networks of joint action are indicative of deeper forces.

With this, the limits of what may be concluded with the available data are reached. There are plenty of questions left unanswered, some with solid leads for future research, and others wide open. The dissertation’s conclusion outlines these questions and offers suggestions for how to proceed in the study of civil resistance. It then ends with some considerations for the practice of civil resistance.

## CONCLUSION

### C.1 A Reflexive Recapitulation

This was intended as a project of forming and reforming, and not of finishing. The subfield of civil resistance studies has burgeoned in recent years, and as it continues to grow it needs not only to expand, but also to strengthen. The premise of this dissertation is that the theorized linkage between civil resistance and democratization was not strong enough, as the research supporting the linkage had previously neglected to explain why some campaigns are potent in the short run but frailer in the long run. Undoubtedly, there are many reasons why history unfolds differently in diverse settings, so it would be foolhardy to suppose that any concise theory could explain all of the long-term outcomes of civil resistance. There is nevertheless value in the summarizing work of theory-building, as it accelerates understanding and enables scholars to synthesize concepts for the further development of knowledge. Thus, this dissertation embraced the extant explanations of why civil resistance works, re-conceptualized them and blended them with related understandings of conflict and political change, and ventured out in an unexplored direction. The idea is that the project would contribute to the growth of civil resistance studies with both expansion and strengthening—helping to form and reform the subfield, with the recognition that completion, even on the narrowed subject at hand, is still a long way off.

The Egyptian case that consumed this study is difficult in more than one way, and it was selected because of the challenges it presents. Amidst the exuberance of people power that swept across the Greater Middle East from late-2010 to mid-2011, the unarmed uprising in Egypt stood as a shining example of what ordinary civilians could achieve by banding together. After ending Mubarak's long tenure, civil resistance campaigners continued to press for democratic reforms, and despite mounting counter-revolutionary efforts from the military establishment, they ushered in a series of liberalizing policies and practices. The democratic advancements culminated in the country's first free and fair presidential election in mid-2012, after which the case for the success of civil resistance in Egypt becomes fraught. Many of the same campaigners from 2011 launched the second campaign against President Morsi in 2013, with similar tactics and objectives. And the second campaign also worked—in the sense that it met its goal of removing the president from office. The problem is that the 2013 campaign's rebooted alliance with the Egyptian military ended with a coup, horrendous civilian massacres, and a reversion to autocracy. Those are not the types of results civil resistance is supposed to produce—certainly not along a pathway that had only months before inspired such optimism.

Now, the long-term fate of post-Mubarak Egypt is yet to be seen, so it would be premature to place the case in any fixed historical category. But it is safe to say that the ideals of freedom and social justice that moved campaigners to continue resistance efforts after Mubarak fell are not yet close to becoming realities. The Sisi Regime has consolidated power and continues to enact policies that prevent civilians from establishing any kind of accountability measures for their government. The turn of events



in late-2013 notwithstanding, the civil resistance campaigns of January 25, 2011 and June 30, 2013 still represent momentous victories for millions of participants, and the energy of those moments will not soon be forgotten.

The successes and failures of this case are plainly tough to reconcile—in terms of hope and despair, and in terms of the confirmations of and challenges to the prevailing wisdom on why civil resistance works. When presented with such contradictions, it is tempting to cling firmer to one's prior understanding and dismiss ill-fitting information as anomalous. Doing so in this case, however, would be of no benefit to either the practice or the scholarship of civil resistance. The alternative is to confront the challenge. And when facing a problem squarely leads to contradictions among one's preconceived notions, then what one must do is try a new perspective. Hence, this dissertation adopted shifts in the theoretical and methodological approaches to the study of civil resistance.

There is in general no guarantee that a fresh perspective will be any better than a familiar perspective, but in this case, the new lenses added clarity and revealed unexpected features. Chapter 1 synthesized various factor-based explanations of civil resistance efficacy with works on the social foundations of democracy to reorient the theoretical discussion around prefigurative social change. It is a subtle move, but it allows one to adapt the lessons of strong trends across many cases for processual analysis. Sundry key themes from the civil resistance literature thus became five analytically distinct mechanisms by which nonviolent campaigns prefigure democracy: (1) fostering inclusive political participation; (2) organizing civil society; (3) establishing civilian checks on authority; (4) implementing procedures for nonviolent conflict management; and (5) instituting practices of egalitarian self-governance. The essential

proposal of this dissertation is that different degrees of effectiveness for civil resistance is a function of how well the mechanisms operate—individually and in reinforcing synchronicity. The plausibility of that claim was tested first on the historical narrative from the lead-up to the 2011 campaign to the aftermath of the 2013 campaign. The record showed that there were indeed critical differences in how well the mechanisms functioned between the two campaigns—the first (more successful) being much closer to ideal-typical than the second (less successful).

However, the historical narrative also indicated that there was a lot happening besides just pro-democracy activism during the 2010-2015 period. In particular, contentious interactions abounded, and it was unclear how exactly they all related to the major civil resistance campaigns. The study of the Egyptian case therefore shifted again, this time not just reorienting the theoretical discussion, but also introducing instruments better suited to the analysis of relational dynamics. The move from historical analysis to formal network analysis was far from subtle, but the advantage of making such a hard gear-shift was it took the investigation to places unreachable by conventional means. And as it turns out, the new zones of inquiry contained valuable information to complement the findings of the first pass at the case.

The network analyses were based on time series data: a comprehensive record of all contentious events in Egypt from 2004 through 2014. Typically, when analyzing event data statistically, one assumes relative independence of the events, so as to test for associations between characteristics of the events. The premise for transforming conflict event records into networks, however, is that the interactions they represent are interdependent. This assumption holds for the case of Egypt, in particular, because

comprehensive data on contentious interaction effectively models the Egyptian field of contention as it evolves over time. Each record contains information about the actors and targets, which then grounds contentious relations and joint action relations—manifestations of oppositional and cooperative aspects of conflict from a Simmelian understanding. The concatenation of these relations at any given time reveals structural properties of the field that were unspecifiable from the historical narrative, and which are impossible to derive from analyses that assume event independence. Furthermore, to study the structures formed by the many relations of contention and joint action in a given place at a given time is to study the context of certain contentious events which occurred in the same place and time.

The network analyses confirmed that the campaigns of 2011 and 2013 differed significantly, shedding new light on their specific contrasts, and leading to hypotheses for why the civil resistance mechanisms faltered after 2011. The success of the campaign against Mubarak kicked off a wave of contention in the country; that much was clear from a *prima facie* examination of the case. But the mere enumeration of events cannot show the profound complexification that developed amidst the rise of contention; only by transforming events into contentious relations and concatenating them into networks was it possible to measure the extent and type of complexity in the field. The analyses of contentious relations produced hard evidence that the network was scale-free in general—which fits the Simmelian framework—and a fair amount of circumstantial evidence to suggest that greater complexity in the field of contention has a dampening or halting effect on the mechanisms linking a civil resistance campaign to subsequent democratization. The networks of contention also indicated that increased proportions of

violence and increased segmentation by identity categories negatively affect democratic prefiguration by civil resistance. Subsequent analysis of joint action relations bolstered the claims about substantive differences in relational context between the campaigns, providing a richer understanding of complexity in the field of contention. Although the networks of joint action were complex enough to be statistically significant among comparable random graphs throughout the 2004-2014 period, there were large fluctuations in the magnitude of complexity—that is, dramatic increases in complexity in late 2012, and significant spikes in mid-2013, during the second campaign. This suggests that greater complexity in the field of contention could represent governmental vulnerability to extra-institutional challenges, thereby increasing the likelihood of short-term success for a civil resistance campaign, while also undermining the kind of social reorganization necessary to establish and consolidate democracy.

These are the distilled points from the network analyses, but it is worth repeating that the findings presented in Chapters 2 and 3 were bountiful. That presents challenges for the task of theorizing, which is inherently simplifying and generalizing. At the same time, the sheer volume of information—much of it demonstrably non-random, no less—is a validation of the shift in perspective. Much of the information contained in the networks would be far more tedious to interpret in prose than in plots, and so a large portion of it was presented without further commentary (with yet more given in the Appendix below). Depending on one's familiarity with such visualizations, they likely require revisited study to convey all of their pertinent information. Together they are a testament to how much scholars of civil resistance and contentious politics have been missing with conventional research methods.

That said, the evidence presented is not nearly enough to settle the matter at hand. The core issue, remember, is how ordinary citizens can overcome illiberal institutions and establish stable democratic governance—which is to say, the full scope of the issue is not dissertation-sized, but subfield-sized. This dissertation necessarily set foci to make headway, and in doing so, it also set limitations. It concerned only one case. And within the one case, the historical record was not nearly exhausted, the full causes of the political changes have not been determined, and the available data on the structure of the field of contention does not come close to depicting all of the relevant conflict dynamics. Even so, the study yielded valuable insights, which deserve to be shared among those interested in civil resistance, and which can be used to guide and support the arduous work that remains in the growing subfield of civil resistance studies.

## C.2 Suggestions for Future Research

There are two paths of inquiry that stem naturally from this project. The first is to check whether the patterns observed in the Egyptian case are also evident in other cases. This could take the form of comparative case studies, essentially replicating the mixed-methods approach of the preceding chapters on a small set of cases of civil resistance with varying outcomes. With a larger set of cases, it would not be feasible to reproduce the in-depth analyses, but the five mechanisms could well serve as a basis for a fuzzy-set qualitative comparative analysis (see Ragin 2008).

Comparison could also take the form of hypothesis testing on cross-sectional time-series data, in which case the quantified network metrics would likely grant the greatest analytical leverage. The base hypothesis to test is that there is a negative correlation between the degree of complexity (for both networks of contention and

networks of joint action) and the likelihood that civil resistance campaigns will advance democratization. Follow-up hypotheses for both types of networks include: (1) there is a negative correlation between cyclomatic number and long-term civil resistance success; (2) there is a negative correlation between global clustering coefficient and long-term civil resistance success; and (3) there is a positive correlation between average shortest path length and long-term civil resistance success. Any or all of these may also be hypothesized to have interaction effects. In addition, any or all of these may be strengthened by adding controls, and by using trendline changes in time-series data (i.e., inflection points) instead of correlating civil resistance success with raw values from the network metrics.

Whether or not the network complexity patterns from the case of Egypt can be shown to be plausibly linked to outcomes in other cases of civil resistance, it would also be fruitful to extend the hypotheses to contentious politics more broadly. There is already a precedent for comparing maximalist civil resistance campaigns (i.e., those seeking regime change, an end to military occupation, or self-determination) to violent insurgencies (Chenoweth and Stephan 2011), so it is quite natural to check whether complexity in the field of contention is statistically related to success in all types of insurrections.

The second path for future research is to improve the modeling of oppositional and cooperative networks surrounding civil resistance campaigns. One could proceed with further analysis using the same data on contentious and joint action relations. The two relations could be combined in multiplex networks and evaluated for deeper structures or correlations in activation and persistence. The contentious relations

networks could also be used to construct implied relations between different entities simultaneously targeted by the same actor. It is a step removed from the concept of cooperation, with its active connotations, but it could nevertheless add insight without having to collect more data.

The alternative, then, is to proceed by collecting expanded data on oppositional and cooperative dynamics. Measuring opposition with specific acts of contention has the distinct advantage of allowing time-series analysis, but it misses tacit states of enmity, competition, and disagreement. It would be interesting to see whether networks based on the latter qualities bear similar structural properties as networks of contention—especially scale-free structuring. The more pressing need, however, is to gather direct observations of cooperative relations to pair with direct observations of oppositional relations. If indeed there is a duality of the two dynamics, then it should be evident in relations that are not explicitly derived from one another. It may not be feasible to collect data on both relations for the exact same set of entities, especially not when entity identifications are allowed to be as fluid as they were in this dissertation. However, samples would suffice to test for basic congruencies between cooperative relations directly observed and joint action relations derived from contentious relations.

### C.3 Parting Words on the Practice of Civil Resistance

In practical application, what this dissertation offers is a set of considerations and tools of analysis for improving strategic planning. It stops short of giving direct advice, for strategy and tactics must always be catered to a local context, and only those who bear the immediate risks associated with civil resistance are qualified to decide the best course of action. These are grave matters, indeed. Some researchers trumpet the practical

suggestions stemming from their findings, ostensibly out of good faith, but also shielded from the consequences of heeding their own well-intentioned advice. Although the author does not wish to impugn anyone in particular, he hopes to set a corrective example in the civil resistance literature. This researcher has direct experience with the kinds of sacrifices nonviolent activists must be willing to make—ranging from stains on one’s reputation all the way to the traumatic loss of life. So this researcher, as an advocate presently free from any serious threats, crafts tools and considerations that are meant to equip civil resistance organizers as they set their own agendas and draw up their own plans.

In other words, the hope is that the products of this dissertation may be of some use in the course of strategic planning. The theoretical contributions will likely be of less utility than the methodological contributions—i.e., the network analysis techniques. When activists sit down for strategic planning, a typical preliminary agenda item is to map out the environment in which they operate: who holds power; who the additional stakeholders are; what the drivers behind policies and practices in need of reform are; what the points of leverage are; etc. There are many ways to organize such mapping exercises, and what this dissertation suggests is that it would be worthwhile to bring formal network analysis into the process. Doing so would require a fair degree of technical skill, but there are many ways to acquire the requisite skills at a relatively low cost. It will also require data. Unfortunately, there is no repository of pre-processed datasets that could be used to construct formal network models of fields of contention. However, that can be remedied with some effort by experts. This project set a precedent for how to do that, and the (free) source dataset contains the necessary information for



dozens of countries (see Salehyan and Hendrix 2014a). It is therefore feasible that practitioners—including trainers and consultants—could in the very near future gain the skills and resources they need to incorporate formal network analysis into strategic planning.

The strategic implications of certain patterns in networks are clear from the preceding discussions, but again, the author strongly cautions against designing strategy around the key points of one project based on one case. Good strategizing involves the consideration of as much information as one can get. If those waging civil resistance can add network analysis to their repertoire, then this dissertation has shown they would be wise to do so.

## APPENDIX A:

### SUPPLEMENTAL DATA

Below are several figures and tables that add perspective on the dynamic network data presented in Chapters 2 and 3. The first section (A.1) elaborates on conflict events in Egypt, including breakdowns of event types, the magnitude of participation per event, and the lethality of events. Section A.2 provides details on the 740 entities serving as vertices in the contentious relations and joint action relations networks, including especially the vertex colors assigned to each entity by the classification scheme introduced in section 2.5.1, along with frequencies (degrees) by entity and vertex color. Section A.3 supplements Chapter 3 specifically with tables and figures reporting data on degree values of notable entities, assortativity trends, and violent/nonviolent tactics.

As in Chapter 2 and 3, data in this appendix derive from version 3.1 of the Social Conflict Analysis Database (Salehyan and Hendrix 2014a; cf. Salehyan, et al. 2012). All data processing, analysis, and plotting for this project was conducted in Wolfram Mathematica, version 11. Replication code for all of the above (organized in Mathematica notebooks and packages) as well as replication data for recoded and constructed values and simulated networks (saved in Mathematica binary files for the Microsoft Windows platform) is available from the author upon request.

#### A.1 Event Data

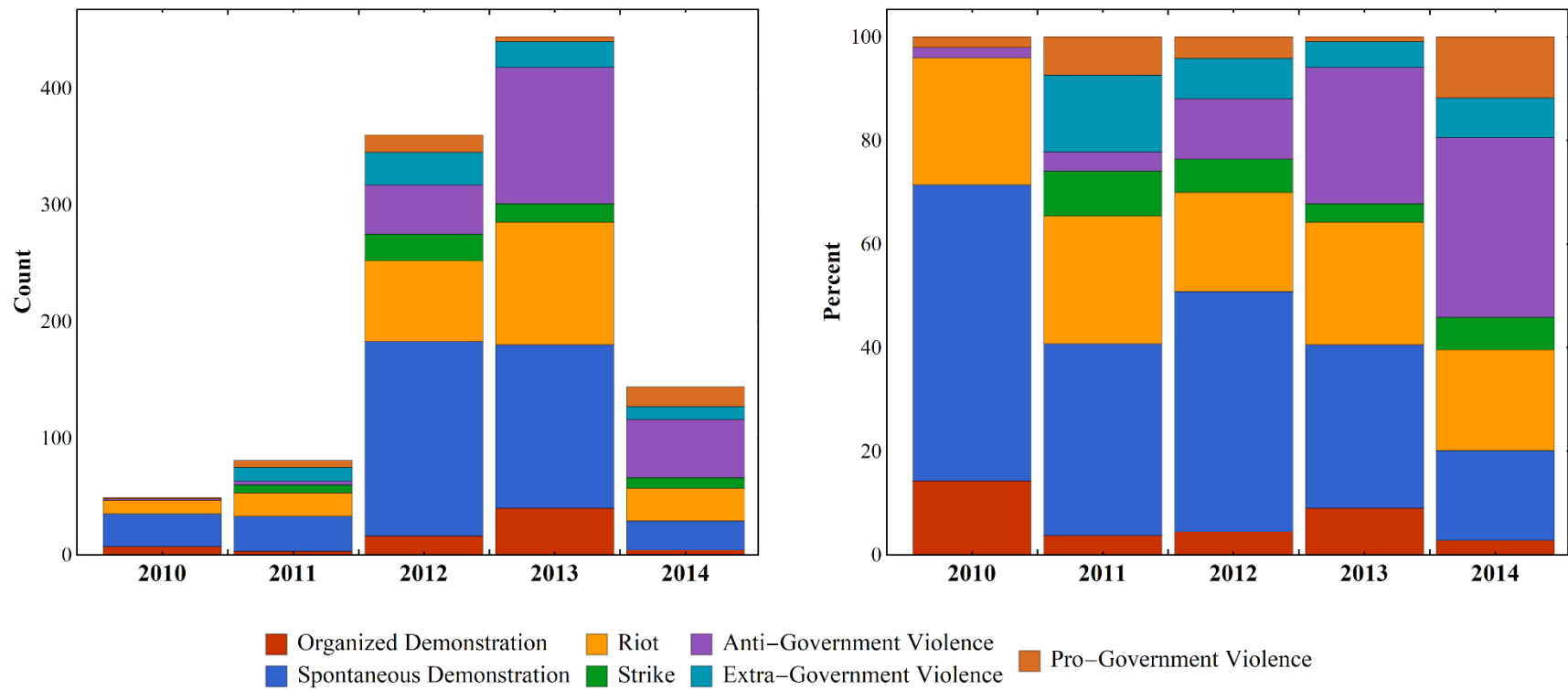


Figure A.1. Event types, by year.

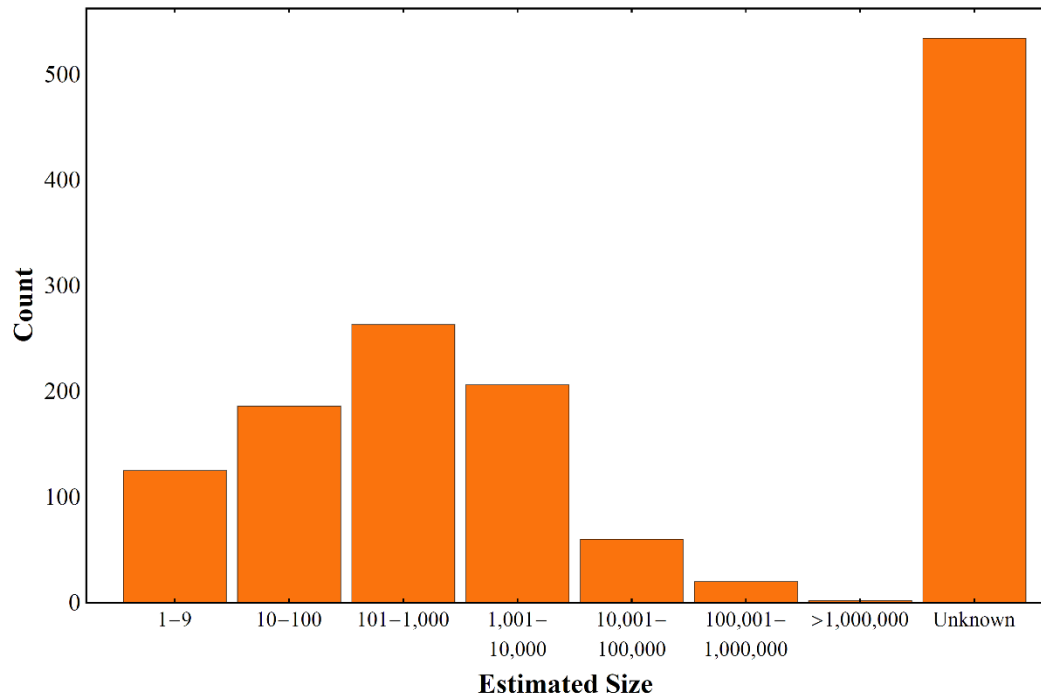


Figure A.2. Distribution of estimated event participation sizes, 1990-2014.

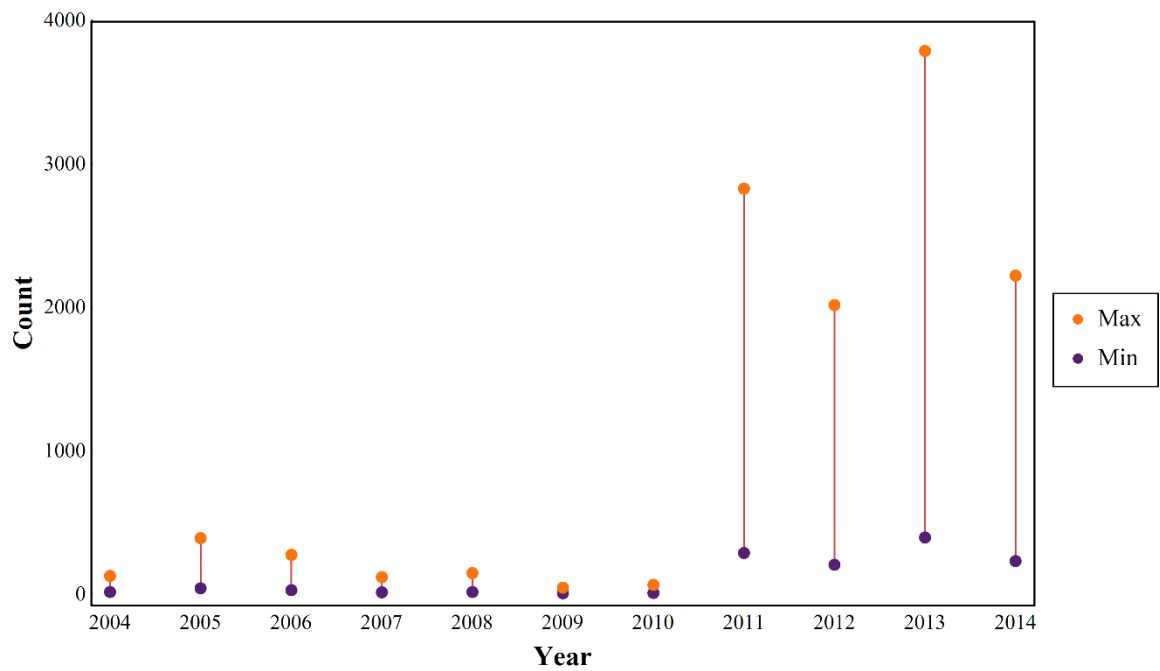


Figure A.3. Estimated total lethality of events, by year.

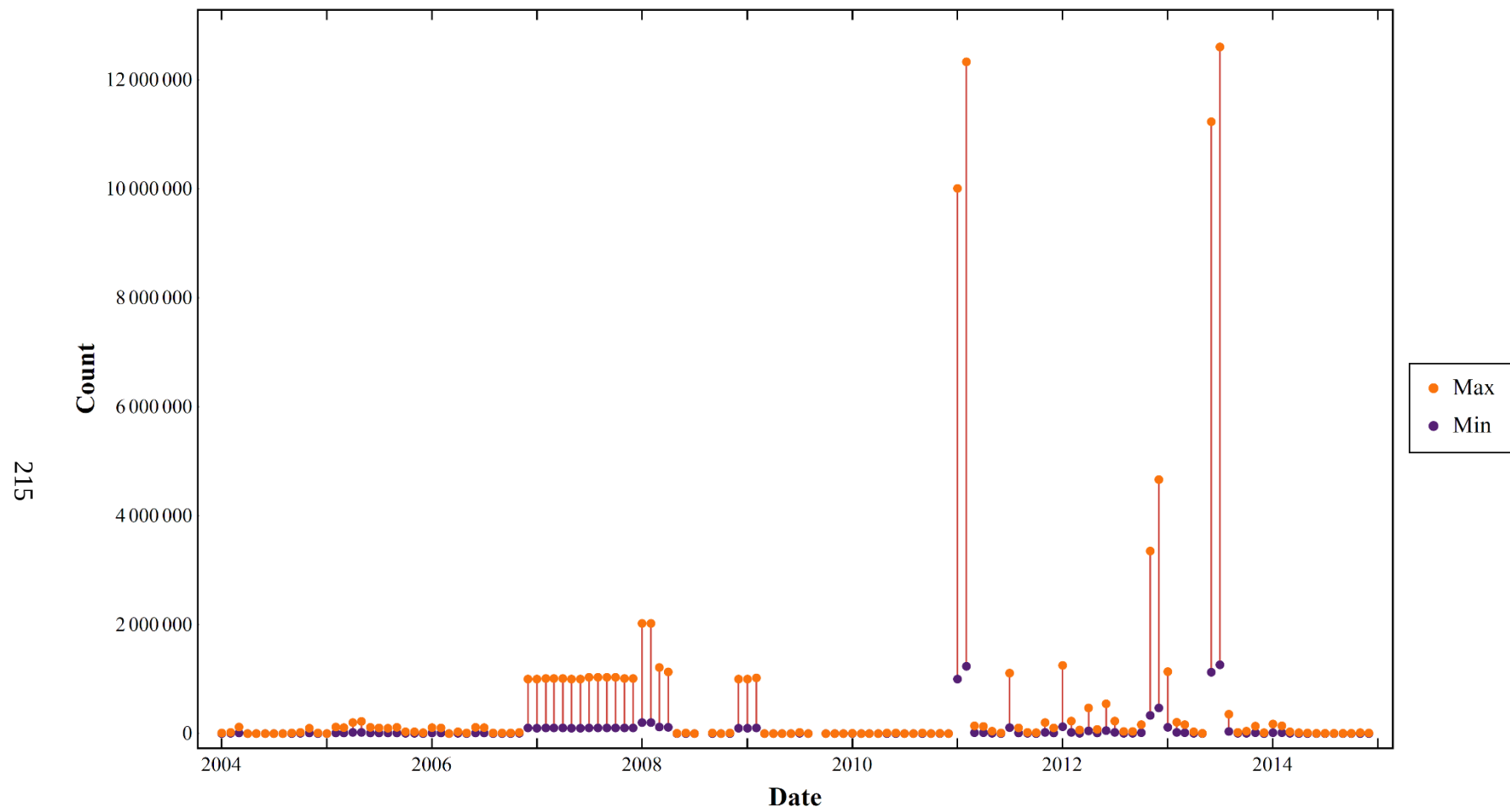


Figure A.4. Estimated total participation in all conflict events, by month.

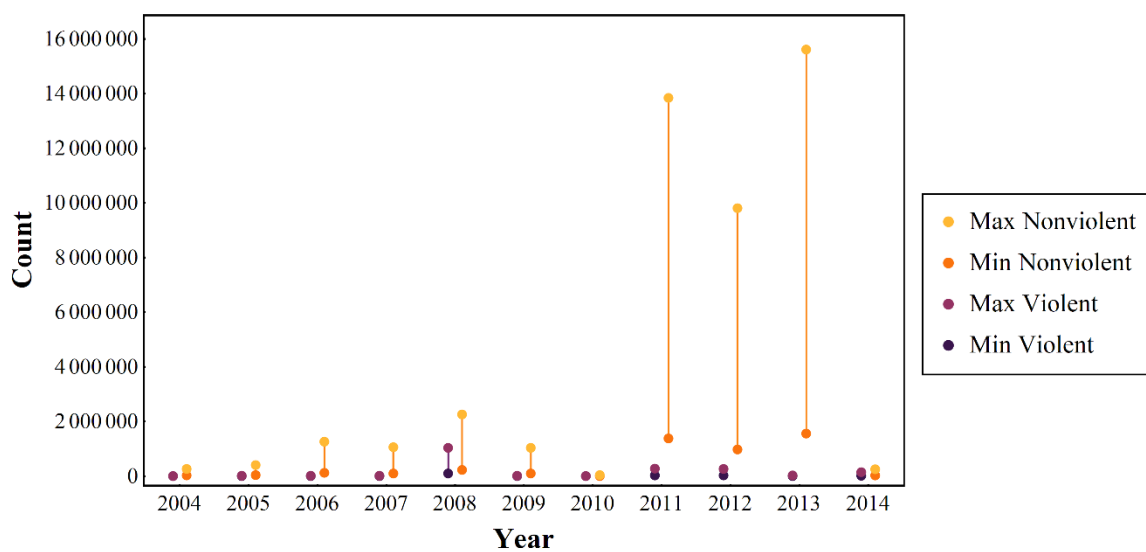


Figure A.5. Estimated total participation in violent and nonviolent events, by year.

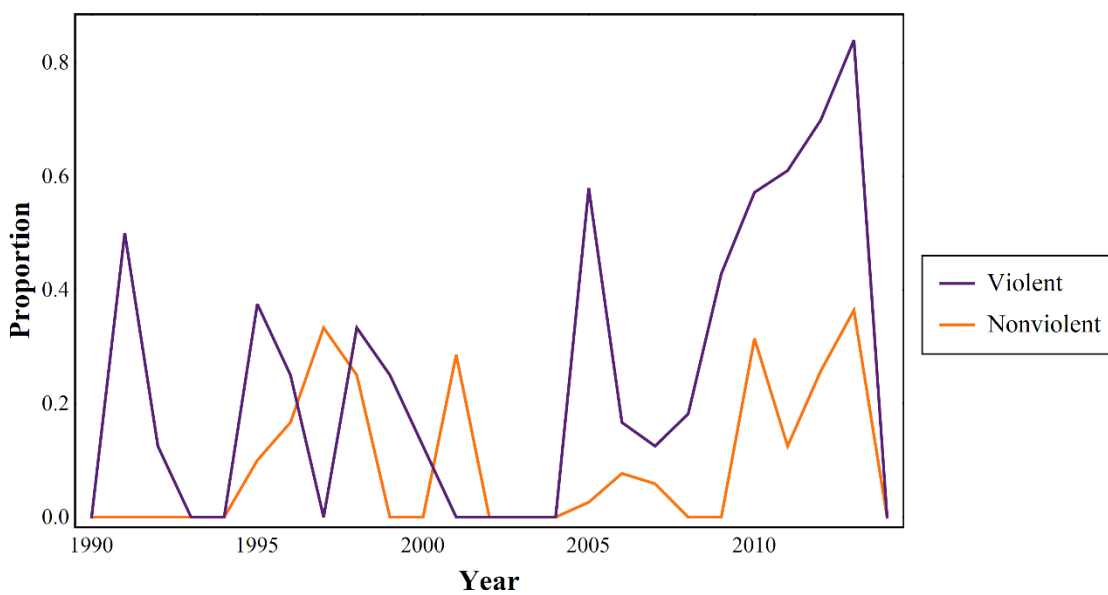


Figure A.6. Proportion of missing participation data for violent and nonviolent events, by year.

## A.2 Entity Data

TABLE A.1.  
NAMES, CATEGORIES, AND DEGREE VALUES FOR ALL ENTITIES  
IN THE AGGREGATE CONTENTIOUS RELATIONS  
AND JOINT ACTION RELATIONS NETWORKS, 2004-2014

| <i>Entity Name</i>                 | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| AbdelFattahElSisi                  | Government                         | 3                                | 0                                 | 0                                  |
| AbdelMaguidMahmoud                 | Other                              | 1                                | 0                                 | 0                                  |
| AbdelMoneimAboulFotouh             | Other                              | 1                                | 0                                 | 0                                  |
| AbdullahElShamy                    | Other                              | 0                                | 1                                 | 9                                  |
| Activists                          | Activists                          | 1                                | 5                                 | 31                                 |
| ActivistsAntiArmedForcesEgypt      | Activists                          | 0                                | 1                                 | 13                                 |
| ActivistsAntiGlobalization         | Activists                          | 0                                | 3                                 | 1                                  |
| ActivistsAntiGovernmentEgypt       | Activists                          | 0                                | 2                                 | 8                                  |
| ActivistsDemocracy                 | Activists                          | 1                                | 1                                 | 4                                  |
| ActivistsFemale                    | Activists                          | 1                                | 0                                 | 0                                  |
| ActivistsForeign                   | Other                              | 0                                | 2                                 | 4                                  |
| ActivistsFrench                    | Other                              | 0                                | 2                                 | 4                                  |
| ActivistsHumanRights               | Activists                          | 0                                | 4                                 | 11                                 |
| ActivistsLeftist                   | Activists                          | 2                                | 2                                 | 2                                  |
| ActivistsLiberal                   | Activists                          | 2                                | 4                                 | 34                                 |
| ActivistsOpposition                | Activists                          | 1                                | 2                                 | 27                                 |
| ActivistsPeace                     | Activists                          | 0                                | 1                                 | 2                                  |
| ActivistsPolitical                 | Activists                          | 0                                | 2                                 | 3                                  |
| ActivistsProGovernment             | Activists                          | 0                                | 1                                 | 0                                  |
| ActivistsProPalestinian            | Activists                          | 0                                | 1                                 | 2                                  |
| ActivistsProReform                 | Activists                          | 0                                | 4                                 | 9                                  |
| ActivistsSecular                   | Activists                          | 3                                | 7                                 | 42                                 |
| ActivistsSecularYouth              | Activists                          | 0                                | 1                                 | 7                                  |
| ActivistsTamarod                   | Activists                          | 1                                | 0                                 | 0                                  |
| ActivistsTradeUnion                | Activists                          | 1                                | 0                                 | 0                                  |
| ActivistsYouth                     | Activists                          | 1                                | 1                                 | 19                                 |
| ActivistsPeaceGrandmothers         | Activists                          | 0                                | 2                                 | 4                                  |
| AdministrationUniversity           | Other                              | 1                                | 0                                 | 0                                  |
| AdministrativeProsecutionAuthority | Government                         | 0                                | 2                                 | 17                                 |
| AhmedSeif                          | Other                              | 2                                | 0                                 | 0                                  |
| AhmedShafik                        | Other                              | 1                                | 0                                 | 0                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                 | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| AidWorkersEuropean                 | Other                              | 0                                | 1                                 | 1                                  |
| AirlineNationalEgypt               | Other                              | 1                                | 0                                 | 0                                  |
| AirTrafficControllers              | Other                              | 0                                | 1                                 | 3                                  |
| AlaaAbdelFattah                    | Activists                          | 0                                | 1                                 | 4                                  |
| AlberSaberAyad                     | Other                              | 2                                | 0                                 | 0                                  |
| AlFurqanBrigades                   | ArmedMilitants                     | 0                                | 1                                 | 0                                  |
| AmbassadorUnitedStates             | Other                              | 1                                | 0                                 | 0                                  |
| AmorousCouple                      | Civilians                          | 1                                | 0                                 | 0                                  |
| AnjadMisr                          | ArmedMilitants                     | 0                                | 5                                 | 4                                  |
| AnniversaryOfCrackdown             | Other                              | 1                                | 0                                 | 0                                  |
| AnsarBeitAlMaqdis                  | ArmedMilitants                     | 0                                | 3                                 | 0                                  |
| AntiCoupAlliance                   | Activists                          | 0                                | 3                                 | 22                                 |
| April6YouthMovement                | Activists                          | 0                                | 7                                 | 24                                 |
| ArabLeague                         | Other                              | 2                                | 0                                 | 0                                  |
| ArafaKamelKhalifa                  | Activists                          | 0                                | 1                                 | 7                                  |
| ArielSharon                        | Other                              | 1                                | 0                                 | 0                                  |
| ArmedAssailant                     | ArmedMilitants                     | 0                                | 2                                 | 0                                  |
| ArmedAssailants                    | ArmedMilitants                     | 2                                | 30                                | 19                                 |
| ArmedAttacker                      | ArmedMilitants                     | 0                                | 1                                 | 0                                  |
| ArmedAttackers                     | ArmedMilitants                     | 0                                | 15                                | 11                                 |
| ArmedBandits                       | Other                              | 0                                | 2                                 | 0                                  |
| ArmedForcesEgypt                   | ArmedForces                        | 17                               | 11                                | 4                                  |
| ArmedMan                           | ArmedMilitants                     | 0                                | 3                                 | 3                                  |
| ArmedMen                           | ArmedMilitants                     | 0                                | 46                                | 19                                 |
| ArmedMenBedouin                    | ArmedMilitants                     | 0                                | 1                                 | 0                                  |
| ArmedMenMasked                     | ArmedMilitants                     | 0                                | 5                                 | 4                                  |
| ArmedTribesmenBedouin              | ArmedMilitants                     | 0                                | 4                                 | 1                                  |
| ArmsTraffickers                    | Other                              | 0                                | 1                                 | 0                                  |
| ArmyCadetsEgypt                    | Other                              | 0                                | 1                                 | 0                                  |
| ArrestedDemonstratorsFemale        | Other                              | 2                                | 0                                 | 0                                  |
| Artists                            | Other                              | 0                                | 3                                 | 5                                  |
| AttackersMasked                    | ArmedMilitants                     | 0                                | 2                                 | 0                                  |
| AuthoritiesEgypt                   | Government                         | 1                                | 0                                 | 0                                  |
| AuthoritiesLocal                   | Government                         | 1                                | 0                                 | 0                                  |
| AuthoritiesPrison                  | Police                             | 0                                | 1                                 | 1                                  |
| AuthoritiesPrisonEgypt             | Police                             | 2                                | 0                                 | 0                                  |
| AuthoritySuezCanal                 | Government                         | 1                                | 0                                 | 0                                  |
| AymanNour                          | Other                              | 0                                | 1                                 | 6                                  |
| Bahais                             | Civilians                          | 1                                | 0                                 | 0                                  |
| BahaiVillagers                     | Civilians                          | 1                                | 0                                 | 0                                  |
| Bakers                             | Other                              | 1                                | 0                                 | 0                                  |
| BanditsMasked                      | Other                              | 0                                | 2                                 | 0                                  |
| BaseMultinationalForceAndObservers | Other                              | 1                                | 0                                 | 0                                  |
| BasePoliceEgypt                    | Police                             | 1                                | 0                                 | 0                                  |
| Bedouins                           | Civilians                          | 0                                | 8                                 | 10                                 |
| BedouinsEgyptian                   | Civilians                          | 0                                | 5                                 | 21                                 |
| BedouinsFawakhriya                 | Civilians                          | 2                                | 0                                 | 0                                  |
| BedouinsTarabinTribe               | Civilians                          | 0                                | 3                                 | 8                                  |
| BedouinsTribesmen                  | Civilians                          | 0                                | 3                                 | 4                                  |
| BishopCoptic                       | Other                              | 1                                | 0                                 | 0                                  |



TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|-----------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| BlackBloc                         | Activists                          | 0                                | 5                                 | 32                                 |
| Bomber                            | ArmedMilitants                     | 0                                | 6                                 | 5                                  |
| Bombers                           | ArmedMilitants                     | 0                                | 2                                 | 2                                  |
| BombersChurch                     | ArmedMilitants                     | 2                                | 0                                 | 0                                  |
| BombersSinai                      | ArmedMilitants                     | 1                                | 0                                 | 0                                  |
| BombersSuicide                    | ArmedMilitants                     | 0                                | 1                                 | 1                                  |
| BomberSuicide                     | ArmedMilitants                     | 0                                | 4                                 | 1                                  |
| BorderGuardsEgypt                 | ArmedForces                        | 0                                | 1                                 | 9                                  |
| BorderGuardsEgyptian              | ArmedForces                        | 1                                | 0                                 | 0                                  |
| BrigadierGeneralEgypt             | ArmedForces                        | 1                                | 0                                 | 0                                  |
| BrigadierGeneralPoliceEgypt       | ArmedForces                        | 1                                | 0                                 | 0                                  |
| BuildingArmedForcesEgypt          | ArmedForces                        | 1                                | 0                                 | 0                                  |
| BuildingCivilAdministration       | Government                         | 1                                | 0                                 | 0                                  |
| BuildingMilitaryIntelligenceEgypt | ArmedForces                        | 2                                | 0                                 | 0                                  |
| BuildingPoliceEgypt               | Police                             | 1                                | 0                                 | 0                                  |
| Buildings                         | Other                              | 1                                | 0                                 | 0                                  |
| BuildingTVStation                 | Other                              | 1                                | 0                                 | 0                                  |
| BuildingUniversity                | Other                              | 1                                | 0                                 | 0                                  |
| Bus                               | Other                              | 2                                | 0                                 | 0                                  |
| BusArmedForcesEgypt               | ArmedForces                        | 1                                | 0                                 | 0                                  |
| BusPoliceEgypt                    | Police                             | 2                                | 0                                 | 0                                  |
| BussesPublic                      | Other                              | 1                                | 0                                 | 0                                  |
| Café                              | Other                              | 1                                | 0                                 | 0                                  |
| CampArmedForcesEgypt              | ArmedForces                        | 1                                | 0                                 | 0                                  |
| CampPoliceEgypt                   | Police                             | 2                                | 0                                 | 0                                  |
| CaptainPoliceEgypt                | Police                             | 1                                | 0                                 | 0                                  |
| CarolineKamel                     | Other                              | 1                                | 0                                 | 0                                  |
| Cars                              | Other                              | 2                                | 0                                 | 0                                  |
| CarsPoliceEgypt                   | Police                             | 1                                | 0                                 | 0                                  |
| Checkpoint                        | ArmedForces                        | 2                                | 0                                 | 0                                  |
| CheckpointArmedForcesEgypt        | ArmedForces                        | 3                                | 0                                 | 0                                  |
| CheckpointBorderEgypt             | ArmedForces                        | 1                                | 0                                 | 0                                  |
| CheckpointPoliceEgypt             | Police                             | 4                                | 0                                 | 0                                  |
| CheckpointSecurityForcesEgypt     | ArmedForces                        | 6                                | 0                                 | 0                                  |
| Child13Male                       | Civilians                          | 1                                | 0                                 | 0                                  |
| Child8Female                      | Civilians                          | 1                                | 0                                 | 0                                  |
| Children                          | Civilians                          | 1                                | 0                                 | 0                                  |
| Christian                         | Civilians                          | 1                                | 0                                 | 0                                  |
| ChristianCoptic                   | Civilians                          | 0                                | 1                                 | 0                                  |
| Christians                        | Civilians                          | 5                                | 5                                 | 7                                  |
| ChristiansCoptic                  | Civilians                          | 9                                | 11                                | 20                                 |
| ChristiansCopticVillagers         | Civilians                          | 1                                | 1                                 | 0                                  |
| ChristiansCopticYouth             | Civilians                          | 1                                | 1                                 | 0                                  |
| ChristianVillagers                | Civilians                          | 1                                | 0                                 | 0                                  |
| Church                            | Other                              | 6                                | 0                                 | 0                                  |
| ChurchCoptic                      | Other                              | 3                                | 0                                 | 0                                  |
| Churches                          | Other                              | 2                                | 0                                 | 0                                  |
| ChurchPrinceTadros                | Other                              | 1                                | 0                                 | 0                                  |
| CindySheehan                      | Other                              | 0                                | 2                                 | 7                                  |
| Citizen                           | Civilians                          | 0                                | 1                                 | 7                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                 | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| CitizensEgyptian                   | Civilians                          | 4                                | 54                                | 96                                 |
| CitizensFemale                     | Civilians                          | 1                                | 1                                 | 4                                  |
| CitizensMale                       | Civilians                          | 0                                | 2                                 | 0                                  |
| CitizensMuslim                     | Civilians                          | 0                                | 1                                 | 0                                  |
| CitizensPalestinian                | Other                              | 0                                | 1                                 | 1                                  |
| CitizenUK                          | Other                              | 1                                | 0                                 | 0                                  |
| CitizenUS                          | Other                              | 1                                | 0                                 | 0                                  |
| Civilian                           | Civilians                          | 1                                | 0                                 | 0                                  |
| Civilians                          | Civilians                          | 4                                | 0                                 | 0                                  |
| CivilServants                      | Other                              | 0                                | 1                                 | 8                                  |
| CivilServantsEgypt                 | Other                              | 0                                | 1                                 | 2                                  |
| ClanNubian                         | Other                              | 1                                | 0                                 | 0                                  |
| ClericMuslim                       | Other                              | 1                                | 0                                 | 0                                  |
| ClericMuslimBrotherhood            | Islamists                          | 1                                | 0                                 | 0                                  |
| ClubJudges                         | Other                              | 0                                | 1                                 | 0                                  |
| ClubJudgesAlexandria               | Other                              | 0                                | 1                                 | 8                                  |
| ClubJudgesCairo                    | Other                              | 1                                | 0                                 | 0                                  |
| ClubJudgesEgypt                    | Other                              | 0                                | 1                                 | 8                                  |
| ClubStateCouncilJudges             | Other                              | 0                                | 1                                 | 17                                 |
| CommanderMilitaryEgyptSenior       | ArmedForces                        | 1                                | 0                                 | 0                                  |
| CommandersArmedForcesEgypt         | ArmedForces                        | 1                                | 0                                 | 0                                  |
| CommandersBorderGuardEgypt         | ArmedForces                        | 1                                | 0                                 | 0                                  |
| CommissionElectionPresidential     | Other                              | 1                                | 0                                 | 0                                  |
| CompanyTextileHolding              | Other                              | 1                                | 0                                 | 0                                  |
| ComplexTV                          | Other                              | 1                                | 0                                 | 0                                  |
| ConscriptPoliceEgypt               | Police                             | 1                                | 0                                 | 0                                  |
| ConstitutionalPanel                | Other                              | 3                                | 0                                 | 0                                  |
| ConstitutionDraftIslamistBacked    | Other                              | 2                                | 0                                 | 0                                  |
| ConvertChristianity                | Other                              | 1                                | 0                                 | 0                                  |
| ConvoyArmedForcesEgypt             | ArmedForces                        | 1                                | 0                                 | 0                                  |
| ConvoyIranian                      | Other                              | 1                                | 0                                 | 0                                  |
| ConvoySecurityForcesEgypt          | ArmedForces                        | 1                                | 0                                 | 0                                  |
| CopticMan                          | Civilians                          | 2                                | 0                                 | 0                                  |
| CountriesWestern                   | Other                              | 1                                | 0                                 | 0                                  |
| CourtCriminalCairo                 | Government                         | 3                                | 0                                 | 0                                  |
| CourtEgypt                         | Government                         | 1                                | 0                                 | 0                                  |
| CourtEgyptZagazig                  | Government                         | 1                                | 0                                 | 0                                  |
| CourtHosniMubarakTrial             | Government                         | 2                                | 0                                 | 0                                  |
| Courthouse                         | Government                         | 2                                | 0                                 | 0                                  |
| CourtOfCassationEgypt              | Government                         | 0                                | 1                                 | 8                                  |
| Criminals                          | Other                              | 2                                | 1                                 | 1                                  |
| CrowdAngryMuslims                  | Civilians                          | 0                                | 2                                 | 2                                  |
| Crowds                             | Civilians                          | 0                                | 2                                 | 1                                  |
| CrowdsMen                          | Civilians                          | 0                                | 1                                 | 0                                  |
| CrowdsTahrirSquare                 | Civilians                          | 0                                | 1                                 | 0                                  |
| Demonstrators                      | Civilians                          | 0                                | 4                                 | 15                                 |
| DemonstratorsAntiGovernmentEgypt   | Civilians                          | 1                                | 0                                 | 0                                  |
| DemonstratorsAntiHosniMubarak      | Civilians                          | 1                                | 0                                 | 0                                  |
| DemonstratorsAntiMuslimBrotherhood | Civilians                          | 3                                | 0                                 | 0                                  |
| DemonstratorsIslamist              | Islamists                          | 0                                | 1                                 | 7                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                 | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| DemonstratorsProGovernment         | Civilians                          | 0                                | 1                                 | 0                                  |
| Denmark                            | Other                              | 1                                | 0                                 | 0                                  |
| Detainees                          | Other                              | 0                                | 1                                 | 0                                  |
| Doctors                            | Other                              | 0                                | 2                                 | 14                                 |
| DoctorsPublicHospitals             | Other                              | 0                                | 1                                 | 3                                  |
| DrugDealers                        | Other                              | 0                                | 1                                 | 0                                  |
| Egyptair                           | Other                              | 3                                | 0                                 | 0                                  |
| EgyptianMale                       | Civilians                          | 0                                | 1                                 | 0                                  |
| EgyptianOrganizationForHumanRights | Other                              | 0                                | 1                                 | 8                                  |
| Egyptians                          | Civilians                          | 1                                | 0                                 | 0                                  |
| Eilat                              | Other                              | 1                                | 0                                 | 0                                  |
| EmbassyEritrea                     | Other                              | 1                                | 0                                 | 0                                  |
| EmbassyEthiopia                    | Other                              | 1                                | 0                                 | 0                                  |
| EmbassyFrance                      | Other                              | 3                                | 0                                 | 0                                  |
| EmbassySyria                       | Other                              | 5                                | 0                                 | 0                                  |
| EmbassyUnitedStates                | Other                              | 3                                | 0                                 | 0                                  |
| ExtremistsIslamic                  | Islamists                          | 0                                | 3                                 | 6                                  |
| FacilityPoliceEgypt                | Police                             | 1                                | 0                                 | 0                                  |
| FacultyUniversityAssiut            | Other                              | 0                                | 1                                 | 1                                  |
| FacultyUniversityAUC               | Other                              | 0                                | 1                                 | 2                                  |
| FamilyArab                         | Civilians                          | 0                                | 1                                 | 0                                  |
| FamilyELAawashir                   | Civilians                          | 1                                | 0                                 | 0                                  |
| FamilyElShaieba                    | Civilians                          | 0                                | 1                                 | 0                                  |
| FamilyNubianDabudiya               | Civilians                          | 1                                | 1                                 | 0                                  |
| FaroukHosny                        | Other                              | 5                                | 0                                 | 0                                  |
| FormerCommandersArmedForcesEgypt   | Other                              | 1                                | 0                                 | 0                                  |
| FormerDirectorSecurityAlexandria   | Other                              | 1                                | 0                                 | 0                                  |
| FormerMinisterInteriorEgypt        | Other                              | 1                                | 0                                 | 0                                  |
| GamalAbdelRahim                    | Other                              | 0                                | 2                                 | 1                                  |
| GangRobbers                        | Other                              | 0                                | 1                                 | 1                                  |
| GeneralPoliceEgypt                 | Police                             | 1                                | 0                                 | 0                                  |
| GeorgeWBush                        | Other                              | 2                                | 0                                 | 0                                  |
| Germany                            | Other                              | 1                                | 0                                 | 0                                  |
| GovernmentEgypt                    | Government                         | 184                              | 1                                 | 1                                  |
| GovernmentEgyptHosniMubarak        | Government                         | 2                                | 0                                 | 0                                  |
| GovernmentEgyptMilitaryRegime      | Government                         | 14                               | 0                                 | 0                                  |
| GovernmentEgyptMohamedMorsi        | Government                         | 1                                | 0                                 | 0                                  |
| GovernmentFrance                   | Other                              | 2                                | 0                                 | 0                                  |
| GovernmentKuwait                   | Other                              | 1                                | 0                                 | 0                                  |
| GovernmentLocal                    | Government                         | 1                                | 0                                 | 0                                  |
| GovernmentProvincial               | Government                         | 1                                | 0                                 | 0                                  |
| GovernmentRegional                 | Government                         | 1                                | 0                                 | 0                                  |
| GovernmentSaudiArabia              | Other                              | 2                                | 0                                 | 0                                  |
| GovernmentUnitedStates             | Other                              | 4                                | 0                                 | 0                                  |
| Governor                           | Government                         | 1                                | 0                                 | 0                                  |
| GovernorMinya                      | Government                         | 1                                | 0                                 | 0                                  |
| GovernorsMuslimBrotherhood         | Government                         | 1                                | 0                                 | 0                                  |
| GroupCivilian                      | Civilians                          | 0                                | 1                                 | 0                                  |
| GroupsActivistYouth                | Activists                          | 0                                | 1                                 | 1                                  |
| GroupsIslamicSalafist              | Islamists                          | 0                                | 1                                 | 3                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                 | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| GroupsIslamist                     | Islamists                          | 0                                | 1                                 | 3                                  |
| GroupsJihadi                       | ArmedMilitants                     | 0                                | 1                                 | 7                                  |
| GroupsOpposition                   | Other                              | 0                                | 6                                 | 14                                 |
| GroupsProDemocracy                 | Other                              | 2                                | 0                                 | 0                                  |
| GuardsMuslimBrotherhood            | Islamists                          | 0                                | 2                                 | 0                                  |
| GuestsWeddingNonIslamist           | Civilians                          | 1                                | 0                                 | 0                                  |
| GuidesUnlicensed                   | Other                              | 1                                | 0                                 | 0                                  |
| HalaFahmy                          | Other                              | 0                                | 1                                 | 16                                 |
| HassaadMuwadHassaad                | Other                              | 1                                | 0                                 | 0                                  |
| HassanAlBrince                     | Other                              | 1                                | 0                                 | 0                                  |
| HeadquartersCampaignAhmedShafiq    | Other                              | 1                                | 0                                 | 0                                  |
| HeadquartersGovernmentProvincial   | Government                         | 2                                | 0                                 | 0                                  |
| HeadquartersMuslimBrotherhood      | Islamists                          | 2                                | 0                                 | 0                                  |
| HeadquartersPartyWafd              | PoliticalParties                   | 1                                | 0                                 | 0                                  |
| HeadquartersPoliceCity             | Police                             | 1                                | 0                                 | 0                                  |
| HeadquartersPoliceEgypt            | Police                             | 4                                | 0                                 | 0                                  |
| HeadquartersPoliceProvincial       | Police                             | 1                                | 0                                 | 0                                  |
| HeadquartersSoccerAssociationEgypt | Other                              | 2                                | 0                                 | 0                                  |
| HelicopterArmedForcesEgypt         | ArmedForces                        | 2                                | 0                                 | 0                                  |
| HeshamQandil                       | Other                              | 1                                | 0                                 | 0                                  |
| HighCourt                          | Government                         | 4                                | 0                                 | 0                                  |
| HighCourtAdministrative            | Government                         | 1                                | 0                                 | 0                                  |
| HillaryClinton                     | Other                              | 2                                | 0                                 | 0                                  |
| HomeCoptic                         | Other                              | 1                                | 0                                 | 0                                  |
| HomeMuradSamyGuirguis              | Other                              | 1                                | 0                                 | 0                                  |
| HomesChristian                     | Other                              | 2                                | 0                                 | 0                                  |
| HomesMembersPartyFreedomJustice    | Other                              | 1                                | 0                                 | 0                                  |
| HosniMubarak                       | Government                         | 10                               | 0                                 | 0                                  |
| Hospital                           | Other                              | 1                                | 0                                 | 0                                  |
| HospitalArmedForcesCairo           | ArmedForces                        | 1                                | 0                                 | 0                                  |
| Hospitals                          | Other                              | 1                                | 0                                 | 0                                  |
| HotelLuxury                        | Other                              | 1                                | 0                                 | 0                                  |
| HumanRightsWatch                   | Other                              | 0                                | 1                                 | 8                                  |
| Hungarian                          | Other                              | 1                                | 0                                 | 0                                  |
| InformantsIsraeli                  | Other                              | 1                                | 0                                 | 0                                  |
| Intellectuals                      | Other                              | 0                                | 3                                 | 5                                  |
| Iran                               | Other                              | 4                                | 0                                 | 0                                  |
| Iraq                               | Other                              | 3                                | 0                                 | 0                                  |
| Islamist                           | Islamists                          | 0                                | 1                                 | 0                                  |
| Islamists                          | Islamists                          | 5                                | 26                                | 30                                 |
| IslamistsHamassLoyalist            | Islamists                          | 0                                | 1                                 | 0                                  |
| IslamistsHardline                  | Islamists                          | 0                                | 3                                 | 0                                  |
| IslamistsHardlineSalafist          | Islamists                          | 0                                | 1                                 | 2                                  |
| IslamistsSalafist                  | Islamists                          | 0                                | 1                                 | 0                                  |
| Israel                             | Other                              | 18                               | 0                                 | 0                                  |
| JirmyAbuMasuh                      | Other                              | 0                                | 1                                 | 0                                  |
| JournalistOpposition               | Other                              | 1                                | 0                                 | 0                                  |
| Journalists                        | Other                              | 2                                | 8                                 | 24                                 |
| JournalistsGerman                  | Other                              | 2                                | 0                                 | 0                                  |
| JournalistsOpponentsMohamedMorsi   | Other                              | 1                                | 0                                 | 0                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                       | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|------------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| JournalistsPhoto                         | Other                              | 0                                | 2                                 | 5                                  |
| JournalistSupportersMohamedMorsi         | Other                              | 0                                | 1                                 | 0                                  |
| Judges                                   | Other                              | 0                                | 1                                 | 4                                  |
| JudgesAppealsCourt                       | Other                              | 0                                | 1                                 | 8                                  |
| JudgesProReform                          | Other                              | 0                                | 2                                 | 10                                 |
| JudgesReferendum                         | Other                              | 0                                | 2                                 | 17                                 |
| Judiciary                                | Government                         | 5                                | 1                                 | 24                                 |
| JundAlIslam                              | ArmedMilitants                     | 0                                | 1                                 | 1                                  |
| Kefaya                                   | Activists                          | 1                                | 9                                 | 38                                 |
| KerolosGhattas                           | Other                              | 1                                | 0                                 | 0                                  |
| KhaledAli                                | Other                              | 0                                | 1                                 | 3                                  |
| Killer                                   | Other                              | 0                                | 1                                 | 1                                  |
| Killers                                  | Other                              | 1                                | 0                                 | 0                                  |
| LailaSoueif                              | Activists                          | 0                                | 1                                 | 4                                  |
| Lawmakers                                | Other                              | 0                                | 2                                 | 0                                  |
| LawmakersOpposition                      | Other                              | 0                                | 3                                 | 4                                  |
| Lawyers                                  | Other                              | 2                                | 8                                 | 21                                 |
| LawyersDefense                           | Other                              | 0                                | 2                                 | 5                                  |
| LeaderMuslimBrotherhood                  | Islamists                          | 1                                | 0                                 | 0                                  |
| LeadersReligiousMuslimSeniorEgypt        | Other                              | 0                                | 1                                 | 2                                  |
| LeadersSummitSharmElSheikh               | Other                              | 1                                | 0                                 | 0                                  |
| LeaderSyndicatePress                     | Other                              | 1                                | 0                                 | 0                                  |
| Libya                                    | Other                              | 2                                | 0                                 | 0                                  |
| Looters                                  | Other                              | 0                                | 2                                 | 0                                  |
| Magistrates                              | Other                              | 0                                | 1                                 | 0                                  |
| Man                                      | Civilians                          | 1                                | 0                                 | 0                                  |
| ManagementTextile                        | Other                              | 1                                | 0                                 | 0                                  |
| ManagerFactory                           | Other                              | 1                                | 0                                 | 0                                  |
| ManagersEgyptair                         | Other                              | 1                                | 0                                 | 0                                  |
| ManagersHotel                            | Other                              | 1                                | 0                                 | 0                                  |
| MediaAlJazeera                           | Other                              | 2                                | 0                                 | 0                                  |
| MembersMuslimBrotherhood                 | Islamists                          | 0                                | 2                                 | 9                                  |
| MembersMuslimBrotherhoodStudent          | Islamists                          | 0                                | 6                                 | 11                                 |
| MembersOppositionParties                 | Other                              | 0                                | 2                                 | 2                                  |
| MembersParliamentEgyptianOpposition      | Other                              | 0                                | 2                                 | 1                                  |
| MembersParliamentLiberal                 | Other                              | 0                                | 2                                 | 0                                  |
| MembersParliamentPartyNationalDemocratic | Other                              | 1                                | 0                                 | 0                                  |
| MenBearded                               | Civilians                          | 0                                | 1                                 | 0                                  |
| MetroStationsCairo                       | Other                              | 1                                | 0                                 | 0                                  |
| MigrantsAfrican                          | Other                              | 0                                | 2                                 | 0                                  |
| MilitantIslamist                         | ArmedMilitants                     | 0                                | 1                                 | 0                                  |
| Militants                                | ArmedMilitants                     | 1                                | 38                                | 27                                 |
| MilitantsAlQaedaInspired                 | ArmedMilitants                     | 0                                | 1                                 | 2                                  |
| MilitantsAnsarBeitAlMaqdis               | ArmedMilitants                     | 3                                | 20                                | 10                                 |
| MilitantsArmyOfIslam                     | ArmedMilitants                     | 0                                | 1                                 | 0                                  |
| MilitantsIslamic                         | ArmedMilitants                     | 2                                | 5                                 | 25                                 |
| MilitantsIslamist                        | ArmedMilitants                     | 0                                | 1                                 | 0                                  |
| MilitantsIslamistBedouin                 | ArmedMilitants                     | 0                                | 1                                 | 0                                  |
| MilitantsJihadistTakfiri                 | ArmedMilitants                     | 0                                | 1                                 | 3                                  |
| MilitantsPalestinian                     | ArmedMilitants                     | 0                                | 1                                 | 1                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>             | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|--------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| MilitaryPoliceEgypt            | ArmedForces                        | 1                                | 0                                 | 0                                  |
| MinisterCulture                | Other                              | 5                                | 0                                 | 0                                  |
| MinisterHealth                 | Other                              | 1                                | 0                                 | 0                                  |
| MinisterInterior               | Other                              | 2                                | 0                                 | 0                                  |
| MinistryDefenseEgypt           | ArmedForces                        | 2                                | 0                                 | 0                                  |
| MinistryFinanceEgypt           | Government                         | 1                                | 0                                 | 0                                  |
| MinistryForeignAffairsEgypt    | Government                         | 2                                | 0                                 | 0                                  |
| MinistryInteriorEgypt          | Government                         | 2                                | 0                                 | 0                                  |
| MinistrySports                 | Government                         | 1                                | 0                                 | 0                                  |
| MinistryTransportation         | Government                         | 1                                | 0                                 | 0                                  |
| MisrSpinningAndWeavingCompany  | Other                              | 1                                | 0                                 | 0                                  |
| Mob                            | Civilians                          | 0                                | 6                                 | 3                                  |
| MobAngry                       | Civilians                          | 0                                | 2                                 | 1                                  |
| MobMenYoung                    | Civilians                          | 0                                | 1                                 | 0                                  |
| MobSunni                       | Civilians                          | 0                                | 1                                 | 0                                  |
| MohamedAbuHamed                | Other                              | 0                                | 2                                 | 7                                  |
| MohamedAlSayedMansourAlToukhi  | Other                              | 1                                | 0                                 | 0                                  |
| MohamedElBaradei               | Other                              | 1                                | 1                                 | 3                                  |
| MohamedMorsi                   | Islamists                          | 9                                | 4                                 | 2                                  |
| MohamedSoltan                  | Other                              | 1                                | 0                                 | 0                                  |
| MohamedYoussefIbrahim          | Other                              | 1                                | 0                                 | 0                                  |
| MonaSeif                       | Activists                          | 0                                | 1                                 | 4                                  |
| MotorcadePrimeMinisterEgypt    | Government                         | 1                                | 0                                 | 0                                  |
| MournersFuneral                | Civilians                          | 1                                | 4                                 | 26                                 |
| MournersPopeShenouda           | Civilians                          | 0                                | 1                                 | 0                                  |
| MovementSalafi                 | Islamists                          | 0                                | 1                                 | 3                                  |
| MovementsOpposition            | Activists                          | 0                                | 2                                 | 18                                 |
| MovieDirectors                 | Other                              | 0                                | 2                                 | 5                                  |
| MultinationalForceAndObservers | Other                              | 3                                | 0                                 | 0                                  |
| Murderer                       | Other                              | 1                                | 0                                 | 0                                  |
| Museum                         | Other                              | 1                                | 0                                 | 0                                  |
| MuslimBrotherhood              | Islamists                          | 21                               | 26                                | 90                                 |
| Muslims                        | Civilians                          | 2                                | 13                                | 18                                 |
| MuslimsEgyptian                | Civilians                          | 2                                | 0                                 | 0                                  |
| MuslimsEgyptians               | Civilians                          | 0                                | 3                                 | 2                                  |
| MuslimsShia                    | Civilians                          | 1                                | 0                                 | 0                                  |
| MuslimsUltraconservative       | Islamists                          | 0                                | 1                                 | 11                                 |
| MuwadHassaad                   | Other                              | 1                                | 0                                 | 0                                  |
| NationalCouncilForWomen        | Other                              | 2                                | 0                                 | 0                                  |
| NationalSalvationFront         | Activists                          | 2                                | 3                                 | 31                                 |
| NetworksTVIndependent          | Other                              | 1                                | 0                                 | 0                                  |
| NetworksTVPrivate              | Other                              | 1                                | 0                                 | 0                                  |
| NewspaperAlGomhuria            | Other                              | 2                                | 0                                 | 0                                  |
| NewspapersForeign              | Other                              | 2                                | 0                                 | 0                                  |
| NewspapersIndependent          | Other                              | 0                                | 1                                 | 18                                 |
| Norway                         | Other                              | 1                                | 0                                 | 0                                  |
| NourAlHamdeen                  | Other                              | 1                                | 0                                 | 0                                  |
| OfficeArmedForcesEgypt         | ArmedForces                        | 1                                | 0                                 | 0                                  |
| OfficeMuslimBrotherhood        | Islamists                          | 1                                | 0                                 | 0                                  |
| OfficePartyFreedomJustice      | Islamists                          | 2                                | 0                                 | 0                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                   | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|--------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| OfficerArmedForcesEgypt              | ArmedForces                        | 1                                | 0                                 | 0                                  |
| OfficerMilitaryEgyptSenior           | ArmedForces                        | 1                                | 0                                 | 0                                  |
| OfficerPoliceEgypt                   | Police                             | 6                                | 0                                 | 0                                  |
| OfficerPoliceEgyptSenior             | Police                             | 1                                | 0                                 | 0                                  |
| OfficerSecurityForcesEgypt           | ArmedForces                        | 1                                | 0                                 | 0                                  |
| OfficesAhmedShafik                   | Other                              | 1                                | 0                                 | 0                                  |
| OfficesAlJazeera                     | Other                              | 1                                | 0                                 | 0                                  |
| OfficesMuslimBrotherhood             | Islamists                          | 1                                | 0                                 | 0                                  |
| OfficesPartyFreedomJustice           | Islamists                          | 1                                | 0                                 | 0                                  |
| OfficesPartyOpposition               | Other                              | 1                                | 0                                 | 0                                  |
| OfficesTamarod                       | Activists                          | 1                                | 0                                 | 0                                  |
| OfficialMinistryLabor                | Other                              | 1                                | 0                                 | 0                                  |
| OfficialsCoptic                      | Other                              | 1                                | 0                                 | 0                                  |
| OfficialsGovernmentLocal             | Other                              | 4                                | 0                                 | 0                                  |
| OmarSuleiman                         | Other                              | 1                                | 0                                 | 0                                  |
| OpponentsArmedForcesEgypt            | Civilians                          | 1                                | 0                                 | 0                                  |
| OpponentsConstitutionDraft           | Civilians                          | 1                                | 1                                 | 0                                  |
| OpponentsConstitutionNew             | Civilians                          | 0                                | 3                                 | 8                                  |
| OpponentsGovernmentEgypt             | Civilians                          | 3                                | 0                                 | 0                                  |
| OpponentsHosniMubarak                | Civilians                          | 1                                | 0                                 | 0                                  |
| OpponentsMohamedMorsi                | Civilians                          | 10                               | 8                                 | 14                                 |
| OpponentsMohamedMorsiCivilian        | Civilians                          | 2                                | 1                                 | 2                                  |
| OpponentsMuammarQaddafi              | Civilians                          | 0                                | 1                                 | 0                                  |
| OpponentsMuslimBrotherhood           | Civilians                          | 1                                | 2                                 | 1                                  |
| OrganizationsCivilSociety            | Other                              | 0                                | 1                                 | 2                                  |
| OrganizationsIslamist                | Islamists                          | 0                                | 1                                 | 4                                  |
| OwnerFerry                           | Other                              | 1                                | 0                                 | 0                                  |
| OwnersBakery                         | Other                              | 0                                | 1                                 | 15                                 |
| PalacePresidentialEgypt              | Government                         | 1                                | 0                                 | 0                                  |
| PalestinianIslamicArmy               | ArmedMilitants                     | 0                                | 1                                 | 0                                  |
| Palestinians                         | Other                              | 0                                | 3                                 | 6                                  |
| PalestiniansGaza                     | Other                              | 1                                | 0                                 | 0                                  |
| PalestiniansMale                     | Other                              | 1                                | 0                                 | 0                                  |
| ParliamentEgypt                      | Government                         | 2                                | 1                                 | 2                                  |
| PartiesOpposition                    | PoliticalParties                   | 0                                | 3                                 | 20                                 |
| PartyAlGhad                          | PoliticalParties                   | 0                                | 2                                 | 21                                 |
| PartyDostour                         | PoliticalParties                   | 0                                | 1                                 | 5                                  |
| PartyIslamistConstructionDevelopment | PoliticalParties                   | 0                                | 1                                 | 0                                  |
| PartyLabor                           | PoliticalParties                   | 0                                | 2                                 | 2                                  |
| PartyNationalDemocratic              | Government                         | 1                                | 0                                 | 0                                  |
| PartyTagammu                         | PoliticalParties                   | 0                                | 2                                 | 10                                 |
| PartyWafd                            | PoliticalParties                   | 1                                | 0                                 | 0                                  |
| PartyWafdRebelFaction                | PoliticalParties                   | 1                                | 1                                 | 0                                  |
| Passerby                             | Civilians                          | 2                                | 0                                 | 0                                  |
| PatrolPoliceEgypt                    | Police                             | 1                                | 0                                 | 0                                  |
| Peacekeepers                         | Other                              | 1                                | 0                                 | 0                                  |
| PeacekeepersFijiian                  | Other                              | 1                                | 0                                 | 0                                  |
| Pedestrians                          | Civilians                          | 1                                | 0                                 | 0                                  |
| Pharmacists                          | Other                              | 0                                | 1                                 | 1                                  |
| PilgrimsEgyptian                     | Civilians                          | 0                                | 1                                 | 0                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>             | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|--------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| PilotsEgyptAir                 | Other                              | 0                                | 1                                 | 0                                  |
| PipelineGas                    | Other                              | 2                                | 0                                 | 0                                  |
| PipelineGasSinai               | Other                              | 3                                | 0                                 | 0                                  |
| PlayersSoccerAlAhly            | Other                              | 1                                | 0                                 | 0                                  |
| PoliceEgypt                    | Police                             | 49                               | 13                                | 35                                 |
| PoliceEgyptLocal               | Police                             | 4                                | 0                                 | 0                                  |
| PoliceEgyptRiot                | Police                             | 1                                | 0                                 | 0                                  |
| PolicemanEgyptian              | Police                             | 0                                | 1                                 | 7                                  |
| PoliceOfficerMaleOffDuty       | Police                             | 0                                | 1                                 | 2                                  |
| PoliceOfficersEgyptian         | Police                             | 2                                | 2                                 | 21                                 |
| PoliceOfficersEgyptianMale     | Police                             | 7                                | 2                                 | 15                                 |
| PoliceOfficersEgyptianRiot     | Police                             | 1                                | 0                                 | 0                                  |
| PoliceOjaBorderCrossing        | Police                             | 1                                | 0                                 | 0                                  |
| PoliticianProMilitary          | Other                              | 1                                | 0                                 | 0                                  |
| PollingStations                | Other                              | 1                                | 0                                 | 0                                  |
| PopeBenedictXVI                | Other                              | 1                                | 0                                 | 0                                  |
| PopeShenudaIII                 | Other                              | 0                                | 2                                 | 0                                  |
| PortAuthorityRedSea            | Other                              | 2                                | 0                                 | 0                                  |
| PostArmedForcesEgypt           | ArmedForces                        | 1                                | 0                                 | 0                                  |
| PostOffice                     | Other                              | 1                                | 0                                 | 0                                  |
| PostSecurityForcesEgypt        | ArmedForces                        | 3                                | 0                                 | 0                                  |
| PriestCoptic                   | Other                              | 1                                | 0                                 | 0                                  |
| PrimeMinisterEgypt             | Government                         | 1                                | 0                                 | 0                                  |
| PrincipalSchool                | Other                              | 1                                | 0                                 | 0                                  |
| PrisonCity                     | Other                              | 1                                | 0                                 | 0                                  |
| Prisoners                      | Other                              | 1                                | 7                                 | 15                                 |
| PrisonersBritish               | Other                              | 0                                | 1                                 | 1                                  |
| PrisonersDutch                 | Other                              | 0                                | 1                                 | 1                                  |
| PrisonersEgyptian              | Other                              | 0                                | 1                                 | 2                                  |
| PrisonersPalestinian           | Other                              | 0                                | 1                                 | 2                                  |
| PrisonGuardsEgypt              | Police                             | 8                                | 1                                 | 0                                  |
| ProfessorsForChange            | Other                              | 0                                | 1                                 | 2                                  |
| ProsecutorGeneralEgypt         | Other                              | 2                                | 0                                 | 0                                  |
| ProsecutorPublic               | Other                              | 2                                | 0                                 | 0                                  |
| Prosecutors                    | Other                              | 0                                | 2                                 | 17                                 |
| ProsecutorsHosniMubarak        | Other                              | 1                                | 0                                 | 0                                  |
| Protester                      | Civilians                          | 1                                | 0                                 | 0                                  |
| Protesters                     | Civilians                          | 8                                | 30                                | 56                                 |
| ProtestersAntiArmedForcesEgypt | Civilians                          | 2                                | 0                                 | 0                                  |
| ProtestersAntiAssad            | Civilians                          | 0                                | 2                                 | 2                                  |
| ProtestersAntiGovernmentEgypt  | Civilians                          | 0                                | 2                                 | 15                                 |
| ProtestersAntiHosniMubarak     | Civilians                          | 0                                | 1                                 | 1                                  |
| ProtestersAntiMohamedMorsi     | Civilians                          | 0                                | 3                                 | 11                                 |
| ProtestersCivilian             | Civilians                          | 0                                | 2                                 | 19                                 |
| ProtestersFemale               | Civilians                          | 0                                | 1                                 | 0                                  |
| ProtestersFridayOfAnger        | Civilians                          | 0                                | 1                                 | 7                                  |
| ProtestersFridayOfMartyrs      | Civilians                          | 0                                | 1                                 | 8                                  |
| ProtestersIslamist             | Islamists                          | 1                                | 3                                 | 12                                 |
| ProtestersMassacreOfTheCentury | Civilians                          | 0                                | 1                                 | 5                                  |
| ProtestersMuslim               | Civilians                          | 0                                | 1                                 | 0                                  |



TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                   | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|--------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| ProtestersProArmedForcesEgypt        | Civilians                          | 0                                | 2                                 | 2                                  |
| ProtestersProMohamedMorsi            | Islamists                          | 1                                | 2                                 | 7                                  |
| ProtestersSunni                      | Civilians                          | 0                                | 1                                 | 0                                  |
| ProtestersTahrirSquare               | Civilians                          | 1                                | 0                                 | 0                                  |
| ProtestersWomen                      | Civilians                          | 0                                | 1                                 | 0                                  |
| ProtestersYoung                      | Civilians                          | 0                                | 1                                 | 18                                 |
| ProvidersPublicService               | Other                              | 1                                | 0                                 | 0                                  |
| ProvidersPublicTransportation        | Other                              | 0                                | 1                                 | 10                                 |
| PublicationsDaily                    | Other                              | 0                                | 1                                 | 16                                 |
| RachidMohamedRachid                  | Other                              | 2                                | 0                                 | 0                                  |
| RecruitsPoliceEgypt                  | Police                             | 1                                | 0                                 | 0                                  |
| ReferendumSecondRound                | Other                              | 3                                | 0                                 | 0                                  |
| RefugeesIraqi                        | Other                              | 0                                | 1                                 | 4                                  |
| RefugeesSudanese                     | Other                              | 0                                | 3                                 | 6                                  |
| RegimeEgyptTransitional              | Government                         | 1                                | 0                                 | 0                                  |
| RelativesBomberSuicideFemale         | Civilians                          | 0                                | 1                                 | 1                                  |
| RelativesBombingSuspectsFemale       | Civilians                          | 0                                | 1                                 | 0                                  |
| RelativesDefendantsFoodRiot          | Civilians                          | 0                                | 1                                 | 0                                  |
| RelativesDetainees                   | Civilians                          | 0                                | 1                                 | 1                                  |
| RelativesDetaineesMuslimBrotherhood  | Civilians                          | 0                                | 2                                 | 12                                 |
| RelativesDetaineesPolitical          | Civilians                          | 0                                | 1                                 | 2                                  |
| RelativesFinanciersMuslimBrotherhood | Civilians                          | 0                                | 1                                 | 0                                  |
| RelativesSuspectedBomberFemale       | Civilians                          | 0                                | 1                                 | 1                                  |
| RelativesSuspectedIslamistTerrorists | Civilians                          | 0                                | 1                                 | 9                                  |
| RelativesVictimsFerryAccident        | Civilians                          | 0                                | 2                                 | 0                                  |
| ReligiousInstitutions                | Other                              | 1                                | 0                                 | 0                                  |
| Reporter                             | Other                              | 1                                | 0                                 | 0                                  |
| RepublicanGuardEgypt                 | ArmedForces                        | 1                                | 0                                 | 0                                  |
| Residents                            | Civilians                          | 0                                | 4                                 | 22                                 |
| ResidentsAswan                       | Civilians                          | 0                                | 1                                 | 1                                  |
| ResidentsAwladKhalifa                | Civilians                          | 0                                | 1                                 | 0                                  |
| ResidentsAwladYehia                  | Civilians                          | 1                                | 0                                 | 0                                  |
| ResidentsBahariya                    | Civilians                          | 0                                | 1                                 | 5                                  |
| ResidentsBurgAlBurullus              | Civilians                          | 0                                | 1                                 | 0                                  |
| ResidentsDamietta                    | Civilians                          | 0                                | 1                                 | 0                                  |
| ResidentsElArish                     | Civilians                          | 0                                | 3                                 | 8                                  |
| ResidentsEzba                        | Civilians                          | 0                                | 2                                 | 0                                  |
| ResidentsLuxor                       | Civilians                          | 0                                | 2                                 | 5                                  |
| ResidentsSamalout                    | Civilians                          | 0                                | 1                                 | 0                                  |
| ResidentsSharmElSheikh               | Civilians                          | 0                                | 1                                 | 2                                  |
| RetiredColonelArmyEgypt              | Other                              | 1                                | 0                                 | 0                                  |
| SaadAlHusseini                       | Other                              | 1                                | 0                                 | 0                                  |
| Saboteurs                            | ArmedMilitants                     | 0                                | 3                                 | 5                                  |
| SalafiCitizens                       | Islamists                          | 0                                | 1                                 | 2                                  |
| Salafists                            | Islamists                          | 1                                | 8                                 | 12                                 |
| SatelliteDish                        | Other                              | 1                                | 0                                 | 0                                  |
| SaudiArabia                          | Other                              | 1                                | 0                                 | 0                                  |
| SecularYouth                         | Civilians                          | 2                                | 0                                 | 0                                  |
| SecurityForcesEgypt                  | ArmedForces                        | 21                               | 9                                 | 6                                  |
| SecurityForcesHurghada               | ArmedForces                        | 0                                | 1                                 | 1                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                      | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|-----------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| ShaabanElShamy                          | Other                              | 2                                | 0                                 | 0                                  |
| ShadiElManaei                           | Other                              | 1                                | 0                                 | 0                                  |
| ShahtahFarhanAlMaatqa                   | Other                              | 1                                | 0                                 | 0                                  |
| ShopOwners                              | Other                              | 1                                | 0                                 | 0                                  |
| ShopOwnersMuslim                        | Other                              | 1                                | 0                                 | 0                                  |
| Shops                                   | Other                              | 2                                | 0                                 | 0                                  |
| ShopsCoptic                             | Other                              | 1                                | 0                                 | 0                                  |
| ShrineSheikhZuweid                      | Other                              | 1                                | 0                                 | 0                                  |
| ShuraCouncilParliamentEgyptUpperHouse   | Other                              | 2                                | 0                                 | 0                                  |
| SingersOpera                            | Other                              | 0                                | 1                                 | 5                                  |
| Sniper                                  | ArmedMilitants                     | 0                                | 1                                 | 1                                  |
| Snipers                                 | ArmedMilitants                     | 0                                | 3                                 | 3                                  |
| SoccerAssociationEgypt                  | Other                              | 5                                | 0                                 | 0                                  |
| SoccerFans                              | Civilians                          | 0                                | 7                                 | 24                                 |
| SoccerFansAhly                          | Civilians                          | 1                                | 5                                 | 10                                 |
| SoccerFansAhlyUltra                     | Civilians                          | 0                                | 1                                 | 19                                 |
| SoccerFansAlMasri                       | Civilians                          | 0                                | 4                                 | 1                                  |
| SoccerFansEgyptian                      | Civilians                          | 0                                | 1                                 | 0                                  |
| SoccerFansGreenEagles                   | Civilians                          | 0                                | 1                                 | 21                                 |
| SoccerFansLibyan                        | Civilians                          | 0                                | 1                                 | 0                                  |
| SoccerFansUltra                         | Civilians                          | 0                                | 2                                 | 12                                 |
| SoccerFansUltrasDevilsClub              | Civilians                          | 0                                | 1                                 | 15                                 |
| SoccerFansZamalek                       | Civilians                          | 0                                | 1                                 | 0                                  |
| SoccerField                             | Other                              | 1                                | 0                                 | 0                                  |
| SoccerPlayersAlgeria                    | Other                              | 1                                | 0                                 | 0                                  |
| Soldier                                 | ArmedForces                        | 5                                | 0                                 | 0                                  |
| SoldiersEgyptian                        | ArmedForces                        | 5                                | 2                                 | 0                                  |
| SoldierUnitedStates                     | Other                              | 1                                | 0                                 | 0                                  |
| SonCandidate                            | Other                              | 1                                | 0                                 | 0                                  |
| SoniaDridi                              | Other                              | 1                                | 0                                 | 0                                  |
| SonLeaderMuslimBrotherhood              | Other                              | 0                                | 1                                 | 0                                  |
| SonsHosniMubarak                        | Other                              | 2                                | 0                                 | 0                                  |
| SpecialForcesEgypt                      | ArmedForces                        | 1                                | 0                                 | 0                                  |
| SpokesmenPartyDostour                   | Other                              | 1                                | 0                                 | 0                                  |
| Stadium                                 | Other                              | 1                                | 0                                 | 0                                  |
| StadiumSoccer                           | Other                              | 1                                | 0                                 | 0                                  |
| StaffAhramOnline                        | Other                              | 0                                | 1                                 | 16                                 |
| StateCouncilEgypt                       | Government                         | 1                                | 2                                 | 17                                 |
| StateSecurityInvestigationsServiceEgypt | Police                             | 3                                | 0                                 | 0                                  |
| StationPoliceEgypt                      | Police                             | 9                                | 0                                 | 0                                  |
| StationPoliceTraffic                    | Police                             | 2                                | 0                                 | 0                                  |
| StationsPoliceEgypt                     | Police                             | 3                                | 0                                 | 0                                  |
| StationTrain                            | Other                              | 1                                | 0                                 | 0                                  |
| StoresChristian                         | Other                              | 2                                | 0                                 | 0                                  |
| Students                                | Civilians                          | 0                                | 4                                 | 17                                 |
| StudentsEgyptian                        | Civilians                          | 0                                | 1                                 | 1                                  |
| StudentsIslamist                        | Islamists                          | 1                                | 1                                 | 3                                  |
| StudentsUniversity                      | Civilians                          | 0                                | 5                                 | 10                                 |
| StudentsUniversityAssiut                | Civilians                          | 0                                | 1                                 | 1                                  |
| StudentsUniversityAUC                   | Civilians                          | 0                                | 1                                 | 2                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                       | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|------------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| StudentsUniversityHelwan                 | Civilians                          | 0                                | 1                                 | 0                                  |
| StudentsUniversityIslamist               | Islamists                          | 0                                | 1                                 | 2                                  |
| StudentUniversityFemale                  | Civilians                          | 1                                | 0                                 | 0                                  |
| SuperiorCourtEgypt                       | Government                         | 1                                | 0                                 | 0                                  |
| SupporterMohamedElBaradei                | Civilians                          | 0                                | 1                                 | 2                                  |
| SupportersAbdelFattahElSisi              | Civilians                          | 0                                | 2                                 | 7                                  |
| SupportersAhmedShafik                    | Civilians                          | 1                                | 2                                 | 3                                  |
| SupportersArmedForcesEgypt               | Civilians                          | 3                                | 7                                 | 5                                  |
| SupportersAymanNour                      | Civilians                          | 0                                | 1                                 | 3                                  |
| SupportersAymanNourLoyalist              | Civilians                          | 1                                | 0                                 | 0                                  |
| SupportersCandidateParliamentIndependent | Civilians                          | 0                                | 1                                 | 0                                  |
| SupportersConstitutionDraft              | Civilians                          | 1                                | 1                                 | 0                                  |
| SupportersGovernmentEgypt                | Civilians                          | 0                                | 2                                 | 1                                  |
| SupportersHamdeenSabahi                  | Civilians                          | 0                                | 1                                 | 5                                  |
| SupportersHazemAbuIsmail                 | Islamists                          | 0                                | 1                                 | 9                                  |
| SupportersHosniMubarak                   | Civilians                          | 0                                | 3                                 | 0                                  |
| SupportersHosniMubarakFormer             | Civilians                          | 4                                | 0                                 | 0                                  |
| SupportersLeaderAlGhadRival              | Civilians                          | 0                                | 1                                 | 0                                  |
| SupportersMohamedMorsi                   | Islamists                          | 17                               | 27                                | 44                                 |
| SupportersMohamedMorsiArmed              | Islamists                          | 0                                | 2                                 | 0                                  |
| SupportersMohamedMorsiIslamist           | Islamists                          | 1                                | 1                                 | 3                                  |
| SupportersMohamedMorsiLoyalists          | Islamists                          | 0                                | 1                                 | 1                                  |
| SupportersMohamedMorsiStudents           | Islamists                          | 0                                | 5                                 | 14                                 |
| SupportersMonaSeif                       | Civilians                          | 0                                | 1                                 | 7                                  |
| SupportersMuslimBrotherhood              | Islamists                          | 2                                | 11                                | 14                                 |
| SupportersOmarSuleiman                   | Civilians                          | 0                                | 1                                 | 0                                  |
| SupportersOpposition                     | Civilians                          | 0                                | 1                                 | 6                                  |
| SupportersPartyNationalDemocratic        | Civilians                          | 1                                | 2                                 | 2                                  |
| SupportersPartyWafdLoyalist              | Civilians                          | 1                                | 1                                 | 0                                  |
| SupportersRegimeMilitary                 | Civilians                          | 0                                | 2                                 | 3                                  |
| SupremeConstitutionalCourtEgypt          | Government                         | 5                                | 2                                 | 30                                 |
| SupremeCouncilOfTheArmedForcesEgypt      | ArmedForces                        | 2                                | 0                                 | 0                                  |
| SuspectedBomber                          | Other                              | 0                                | 1                                 | 1                                  |
| SuspectedBusinessesProIslamist           | Other                              | 1                                | 0                                 | 0                                  |
| SuspectedChildMolesterCoptic             | Other                              | 1                                | 0                                 | 0                                  |
| SuspectedIslamists                       | Other                              | 0                                | 1                                 | 0                                  |
| SuspectedKillerPolice                    | Other                              | 1                                | 0                                 | 0                                  |
| SuspectedMilitants                       | Other                              | 2                                | 0                                 | 0                                  |
| SuspectedMilitantsIslamic                | Other                              | 0                                | 1                                 | 2                                  |
| SuspectedMurderer                        | Other                              | 1                                | 0                                 | 0                                  |
| SuspectedMurdererRapist                  | Other                              | 1                                | 0                                 | 0                                  |
| SuspectedSupportersArmedForcesEgypt      | Other                              | 0                                | 1                                 | 0                                  |
| SuspectedThiefCar                        | Other                              | 1                                | 0                                 | 0                                  |
| SuspectedThieves                         | Other                              | 1                                | 0                                 | 0                                  |
| Synagogue                                | Other                              | 1                                | 0                                 | 0                                  |
| SyndicatePress                           | Other                              | 0                                | 3                                 | 8                                  |
| SyndicatePressNewspapers                 | Other                              | 0                                | 1                                 | 8                                  |
| Syria                                    | Other                              | 1                                | 0                                 | 0                                  |
| SyrianNationalCouncil                    | Other                              | 0                                | 1                                 | 2                                  |
| Syrians                                  | Other                              | 0                                | 1                                 | 2                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>                       | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|------------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| SystemTrain                              | Other                              | 1                                | 0                                 | 0                                  |
| TalaatIbrahimAbdallah                    | Other                              | 1                                | 0                                 | 0                                  |
| Tamarod                                  | Activists                          | 0                                | 3                                 | 10                                 |
| TarekAlZomor                             | Islamists                          | 0                                | 1                                 | 1                                  |
| TawfiqOkasha                             | Other                              | 0                                | 4                                 | 8                                  |
| TawhidWalJihad                           | ArmedMilitants                     | 3                                | 3                                 | 11                                 |
| TeachersIslamist                         | Islamists                          | 0                                | 1                                 | 3                                  |
| Technician                               | Other                              | 1                                | 0                                 | 0                                  |
| TerminalGas                              | Other                              | 1                                | 0                                 | 0                                  |
| ThugsGovernmentEgypt                     | Other                              | 0                                | 1                                 | 0                                  |
| ThugsProHosniMubarak                     | Other                              | 0                                | 1                                 | 0                                  |
| TouristRussian                           | Other                              | 1                                | 0                                 | 0                                  |
| Tourists                                 | Other                              | 7                                | 0                                 | 0                                  |
| TouristsBrazilian                        | Other                              | 1                                | 0                                 | 0                                  |
| TouristsForeign                          | Other                              | 2                                | 0                                 | 0                                  |
| TouristSingaporean                       | Other                              | 1                                | 0                                 | 0                                  |
| TouristsKorean                           | Other                              | 1                                | 0                                 | 0                                  |
| TouristsSouthKorean                      | Other                              | 1                                | 0                                 | 0                                  |
| TouristsUnitedStates                     | Other                              | 3                                | 0                                 | 0                                  |
| TracksTrain                              | Other                              | 1                                | 0                                 | 0                                  |
| Train                                    | Other                              | 1                                | 0                                 | 0                                  |
| Tribesmen                                | Civilians                          | 0                                | 3                                 | 11                                 |
| TribesmenBaniHilal                       | Civilians                          | 1                                | 1                                 | 0                                  |
| TroopsArmedForcesEgypt                   | ArmedForces                        | 1                                | 0                                 | 0                                  |
| TroopsBorderGuardEgypt                   | ArmedForces                        | 6                                | 0                                 | 0                                  |
| TroopsEgyptian                           | ArmedForces                        | 1                                | 1                                 | 1                                  |
| TroopsSecurityForcesEgypt                | ArmedForces                        | 3                                | 0                                 | 0                                  |
| TruckPrisonerTransport                   | Other                              | 2                                | 0                                 | 0                                  |
| UltraconservativeCitizens                | Islamists                          | 0                                | 2                                 | 2                                  |
| UnionJournalist                          | WorkersUnions                      | 0                                | 1                                 | 9                                  |
| UnionsLabor                              | WorkersUnions                      | 0                                | 1                                 | 2                                  |
| UnitedNationsHighCommissionerForRefugees | Other                              | 1                                | 0                                 | 0                                  |
| UnitedStates                             | Other                              | 17                               | 0                                 | 0                                  |
| UniversitiesEgypt                        | Other                              | 1                                | 0                                 | 0                                  |
| UniversityAlAzhar                        | Other                              | 1                                | 0                                 | 0                                  |
| UniversityHelwan                         | Other                              | 1                                | 0                                 | 0                                  |
| UprisingOfWomenInTheArabWorld            | Activists                          | 0                                | 1                                 | 15                                 |
| VehicleArmedForcesEgypt                  | ArmedForces                        | 4                                | 0                                 | 0                                  |
| VehicleArmedForcesIsraeli                | Other                              | 1                                | 0                                 | 0                                  |
| VehiclePoliceEgypt                       | Police                             | 1                                | 0                                 | 0                                  |
| VendorsSouvenir                          | Other                              | 1                                | 0                                 | 0                                  |
| VesselNaval                              | ArmedForces                        | 1                                | 0                                 | 0                                  |
| VictimsFire                              | Civilians                          | 0                                | 2                                 | 4                                  |
| VictimsFlood                             | Civilians                          | 0                                | 1                                 | 4                                  |
| VictimsRockslide                         | Civilians                          | 0                                | 1                                 | 0                                  |
| Vigilantes                               | Other                              | 0                                | 1                                 | 0                                  |
| Villagers                                | Civilians                          | 1                                | 6                                 | 6                                  |
| VillagersMuslim                          | Civilians                          | 1                                | 5                                 | 1                                  |
| ViolenceReligious                        | Other                              | 4                                | 0                                 | 0                                  |
| VolunteersProtectingWomen                | Other                              | 0                                | 1                                 | 4                                  |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>              | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|---------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| VotersOpposition                | Other                              | 1                                | 1                                 | 0                                  |
| Warehouses                      | Other                              | 1                                | 0                                 | 0                                  |
| WaterTruckPoliceEgypt           | Police                             | 1                                | 0                                 | 0                                  |
| WeddingGuestsIslamist           | Islamists                          | 0                                | 1                                 | 0                                  |
| Woman                           | Civilians                          | 1                                | 0                                 | 0                                  |
| WomanMuslim                     | Civilians                          | 1                                | 0                                 | 0                                  |
| Women                           | Civilians                          | 2                                | 5                                 | 7                                  |
| WomenCitizens                   | Civilians                          | 0                                | 1                                 | 17                                 |
| WomenEgyptian                   | Civilians                          | 0                                | 2                                 | 8                                  |
| WorkerAmbulanceChristian        | WorkersUnions                      | 1                                | 0                                 | 0                                  |
| WorkerApacheCorporation         | WorkersUnions                      | 1                                | 0                                 | 0                                  |
| WorkerDriverMinibus             | WorkersUnions                      | 0                                | 1                                 | 0                                  |
| WorkerDrivingBus                | WorkersUnions                      | 1                                | 0                                 | 0                                  |
| WorkerDrivingEgyptian           | WorkersUnions                      | 1                                | 0                                 | 0                                  |
| Workers                         | WorkersUnions                      | 0                                | 2                                 | 25                                 |
| WorkersAirport                  | WorkersUnions                      | 0                                | 1                                 | 4                                  |
| WorkersBaggageHandling          | WorkersUnions                      | 0                                | 1                                 | 0                                  |
| WorkersBaggageHandlingEgyptair  | WorkersUnions                      | 0                                | 1                                 | 2                                  |
| WorkersBrick                    | WorkersUnions                      | 0                                | 1                                 | 17                                 |
| WorkersCanal                    | WorkersUnions                      | 0                                | 2                                 | 8                                  |
| WorkersChinese                  | WorkersUnions                      | 1                                | 0                                 | 0                                  |
| WorkersDock                     | WorkersUnions                      | 0                                | 1                                 | 0                                  |
| WorkersFactory                  | WorkersUnions                      | 0                                | 1                                 | 0                                  |
| WorkersFarms                    | WorkersUnions                      | 0                                | 1                                 | 10                                 |
| WorkersFarmsPig                 | WorkersUnions                      | 0                                | 1                                 | 1                                  |
| WorkersFlightAttendants         | WorkersUnions                      | 0                                | 1                                 | 2                                  |
| WorkersFlightAttendantsEgyptair | WorkersUnions                      | 0                                | 1                                 | 2                                  |
| WorkersGarment                  | WorkersUnions                      | 0                                | 2                                 | 1                                  |
| WorkersHospital                 | WorkersUnions                      | 1                                | 1                                 | 0                                  |
| WorkersMicrobusDriving          | WorkersUnions                      | 0                                | 1                                 | 17                                 |
| WorkersMinibusDriving           | WorkersUnions                      | 0                                | 1                                 | 22                                 |
| WorkersMunicipality             | WorkersUnions                      | 1                                | 0                                 | 0                                  |
| WorkersNewspaperAlGomhuria      | WorkersUnions                      | 0                                | 2                                 | 1                                  |
| WorkersNotaries                 | WorkersUnions                      | 0                                | 1                                 | 4                                  |
| WorkersOperaHouse               | WorkersUnions                      | 0                                | 2                                 | 5                                  |
| WorkersPort                     | WorkersUnions                      | 0                                | 1                                 | 18                                 |
| WorkersPoultryIndustry          | WorkersUnions                      | 0                                | 1                                 | 0                                  |
| WorkersPublicSector             | WorkersUnions                      | 0                                | 1                                 | 19                                 |
| WorkersQuarry                   | WorkersUnions                      | 0                                | 3                                 | 0                                  |
| WorkersRailway                  | WorkersUnions                      | 1                                | 1                                 | 11                                 |
| WorkersRickshawDrivers          | WorkersUnions                      | 0                                | 1                                 | 0                                  |
| WorkersStateIndustry            | WorkersUnions                      | 0                                | 1                                 | 8                                  |
| WorkersStreetVending            | WorkersUnions                      | 1                                | 1                                 | 0                                  |
| WorkersTaxiDriving              | WorkersUnions                      | 0                                | 2                                 | 4                                  |
| WorkersTeaching                 | WorkersUnions                      | 0                                | 1                                 | 3                                  |
| WorkersTextile                  | WorkersUnions                      | 0                                | 2                                 | 0                                  |
| WorkersTourGuides               | WorkersUnions                      | 0                                | 3                                 | 1                                  |
| WorkersTrain                    | WorkersUnions                      | 0                                | 1                                 | 11                                 |
| WorkersTrainDriving             | WorkersUnions                      | 0                                | 1                                 | 5                                  |
| WorkersTransportation           | WorkersUnions                      | 0                                | 1                                 | 10                                 |

TABLE A.1. (CONTINUED)

| <i>Entity Name</i>  | <i>Category<br/>(Vertex Color)</i> | <i>Contentious<br/>In-Degree</i> | <i>Contentious<br/>Out-Degree</i> | <i>Joint<br/>Action<br/>Degree</i> |
|---------------------|------------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| WorkersTruckDriving | WorkersUnions                      | 0                                | 1                                 | 16                                 |
| WorkersWarehouse    | WorkersUnions                      | 0                                | 1                                 | 9                                  |
| WorldEconomicForum  | Other                              | 1                                | 0                                 | 0                                  |
| Worshippers         | Civilians                          | 0                                | 1                                 | 0                                  |
| WorshippersMuslim   | Civilians                          | 1                                | 0                                 | 0                                  |
| Writers             | Other                              | 0                                | 3                                 | 5                                  |
| Youth               | Civilians                          | 0                                | 1                                 | 0                                  |
| YouthGroup          | Civilians                          | 0                                | 1                                 | 1                                  |
| YouthMuslim         | Civilians                          | 1                                | 1                                 | 0                                  |

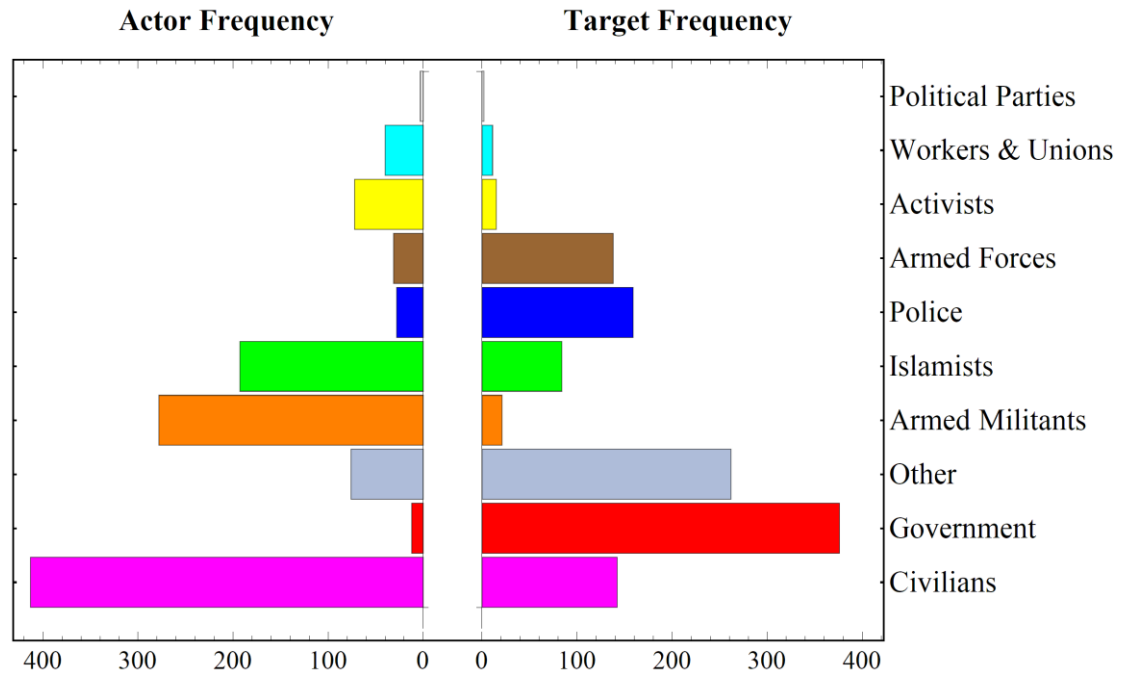


Figure A.7. Contentious event frequencies by vertex color, 2011-2014.

### A.3 Joint Action Relations Network Data

TABLE A.2.  
NOTABLE ENTITIES IN THE JOINT ACTION RELATIONS NETWORK,  
SORTED BY DEGREE CENTRALITY

| <i>Entity</i>                | <i>Category</i> | <i>Degree<br/>2004-<br/>2014</i> | <i>Degree<br/>Jan<br/>2011</i> | <i>Degree<br/>Feb<br/>2011</i> | <i>Degree<br/>Jun<br/>2013</i> | <i>Degree<br/>Jul<br/>2013</i> |
|------------------------------|-----------------|----------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Citizens, Egyptian           | Civilians       | 96                               | 0                              | 0                              | 0                              | 0                              |
| Muslim Brotherhood           | Islamists       | 90                               | 0                              | 0                              | 8                              | 8                              |
| Protesters                   | Civilians       | 56                               | 1                              | 0                              | 8                              | 8                              |
| Supporters,<br>Mohamed Morsi | Islamists       | 44                               | 0                              | 0                              | 8                              | 13                             |
| Activists, Secular           | Activists       | 42                               | 0                              | 0                              | 0                              | 0                              |
| Kefaya                       | Activists       | 38                               | 0                              | 0                              | 0                              | 0                              |
| Police, Egypt                | Police          | 35                               | 4                              | 6                              | 6                              | 0                              |
| Activists, Liberal           | Activists       | 34                               | 0                              | 0                              | 0                              | 0                              |
| Activists                    | Activists       | 31                               | 0                              | 0                              | 0                              | 0                              |
| National Salvation<br>Front  | Activists       | 31                               | 0                              | 0                              | 0                              | 0                              |
| Islamists                    | Islamists       | 30                               | 0                              | 0                              | 9                              | 9                              |
| Militants                    | Armed Militants | 27                               | 0                              | 0                              | 1                              | 4                              |
| Activists, Opposition        | Activists       | 27                               | 0                              | 8                              | 0                              | 0                              |
| Militants, Islamic           | Armed Militants | 25                               | 0                              | 0                              | 0                              | 2                              |
| Workers                      | Workers& Unions | 25                               | 0                              | 0                              | 0                              | 0                              |
| April 6 Youth<br>Movement    | Activists       | 24                               | 0                              | 0                              | 0                              | 0                              |
| Residents                    | Civilians       | 22                               | 0                              | 0                              | 0                              | 2                              |
| Anti-Coup Alliance           | Activists       | 22                               | 0                              | 0                              | 8                              | 8                              |
| Armed Assailants             | Armed Militants | 19                               | 0                              | 0                              | 0                              | 8                              |
| Armed Men                    | Armed Militants | 19                               | 0                              | 0                              | 3                              | 8                              |
| Protesters, Civilian         | Civilians       | 19                               | 5                              | 8                              | 0                              | 0                              |
| Muslims                      | Civilians       | 18                               | 2                              | 0                              | 0                              | 0                              |

TABLE A.3.  
NOTABLE ENTITIES IN THE JOINT ACTION RELATIONS NETWORK  
AND THE PERCENTAGES OF THEIR DEGREE VALUES  
CONSISTING OF MUTUAL VIOLENT ACTION

| <i>Entity</i>                | <i>Category</i>  | <i>Degree<br/>2004-<br/>2014<br/>%Violent</i> | <i>Degree<br/>Jan 2011<br/>%Violent</i> | <i>Degree<br/>Feb 2011<br/>%Violent</i> | <i>Degree<br/>Jun 2013<br/>%Violent</i> | <i>Degree<br/>Jul 2013<br/>%Violent</i> |
|------------------------------|------------------|-----------------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|
| Citizens, Egyptian           | Civilians        | 15.02                                         | -                                       | -                                       | -                                       | -                                       |
| Muslim<br>Brotherhood        | Islamists        | 9.64                                          | -                                       | -                                       | 17.5                                    | 14.81                                   |
| Protesters                   | Civilians        | 11.17                                         | 0                                       | -                                       | 8.0                                     | 4.76                                    |
| Supporters,<br>Mohamed Morsi | Islamists        | 19.26                                         | -                                       | -                                       | 31.34                                   | 0.3                                     |
| Activists, Secular           | Activists        | 9.30                                          | -                                       | -                                       | -                                       | -                                       |
| Kefaya                       | Activists        | 9.43                                          | -                                       | -                                       | -                                       | -                                       |
| Police, Egypt                | Police           | 14.56                                         | 11.11                                   | 7.14                                    | 0                                       | -                                       |
| Activists, Liberal           | Activists        | 10.75                                         | -                                       | -                                       | -                                       | -                                       |
| Activists                    | Activists        | 11.83                                         | -                                       | -                                       | -                                       | -                                       |
| National Salvation<br>Front  | Activists        | 4.4                                           | -                                       | -                                       | -                                       | -                                       |
| Islamists                    | Islamists        | 19.7                                          | -                                       | -                                       | 10.71                                   | 36.84                                   |
| Militants                    | Armed Militants  | 79.84                                         | -                                       | -                                       | 100                                     | 100                                     |
| Activists,<br>Opposition     | Activists        | 6.85                                          | -                                       | 7.69                                    | -                                       | -                                       |
| Militants, Islamic           | Armed Militants  | 64.21                                         | -                                       | -                                       | -                                       | 100                                     |
| Workers                      | Workers & Unions | 4.35                                          | -                                       | -                                       | -                                       | -                                       |
| April 6 Youth<br>Movement    | Activists        | 14.04                                         | -                                       | -                                       | -                                       | -                                       |
| Residents                    | Civilians        | 22.64                                         | -                                       | -                                       | -                                       | 100                                     |
| Anti-Coup Alliance           | Activists        | 6.67                                          | -                                       | -                                       | 21.21                                   | 17.39                                   |
| Armed Assailants             | Armed Militants  | 92.59                                         | -                                       | -                                       | -                                       | 87.5                                    |
| Armed Men                    | Armed Militants  | 95.5                                          | -                                       | -                                       | 100                                     | 100                                     |
| Protesters, Civilian         | Civilians        | 14.55                                         | 7.14                                    | 7.41                                    | -                                       | -                                       |
| Muslims                      | Civilians        | 36.84                                         | 100                                     | -                                       | -                                       | -                                       |



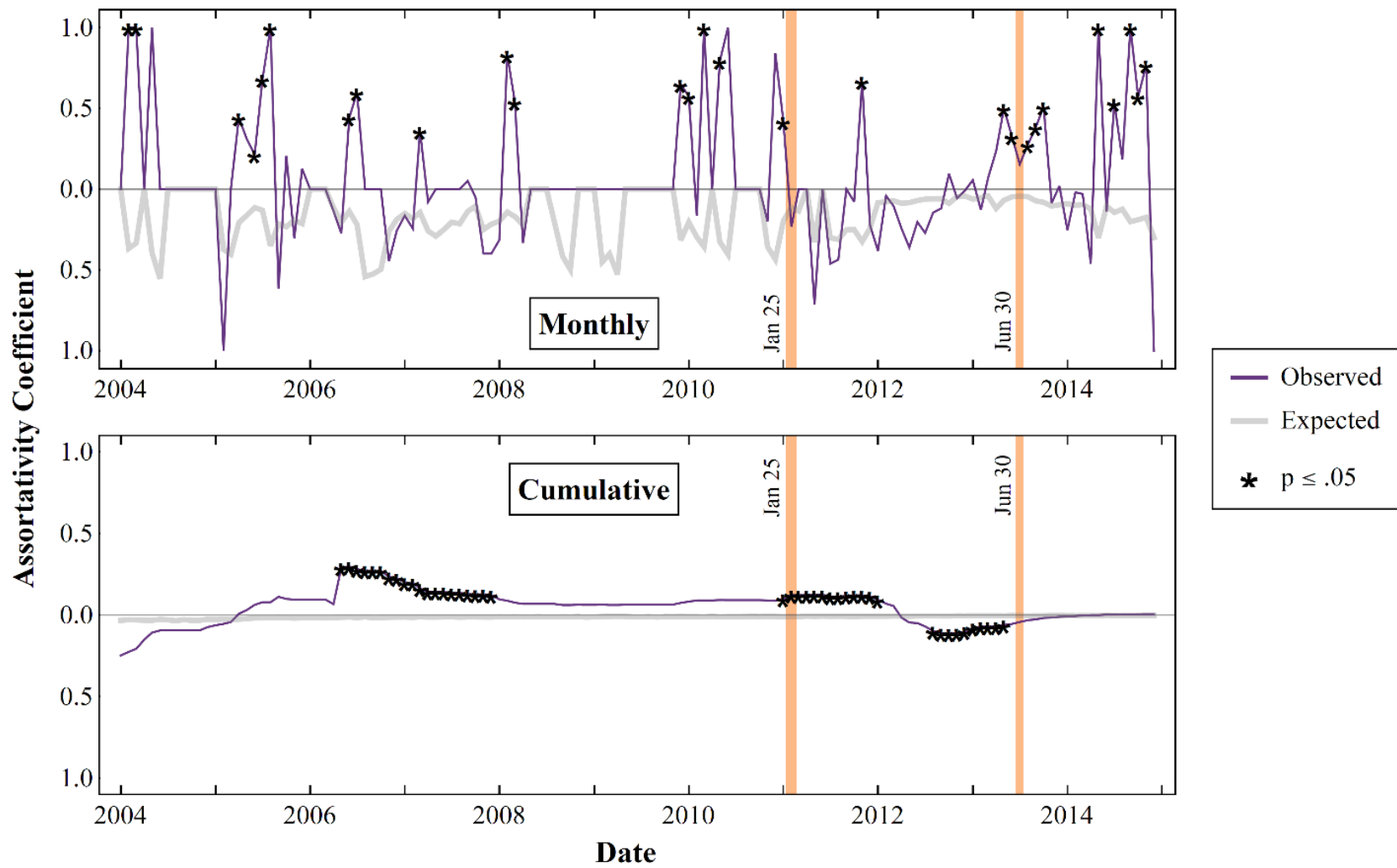


Figure A.8. Degree assortativity in joint action relations networks over time.

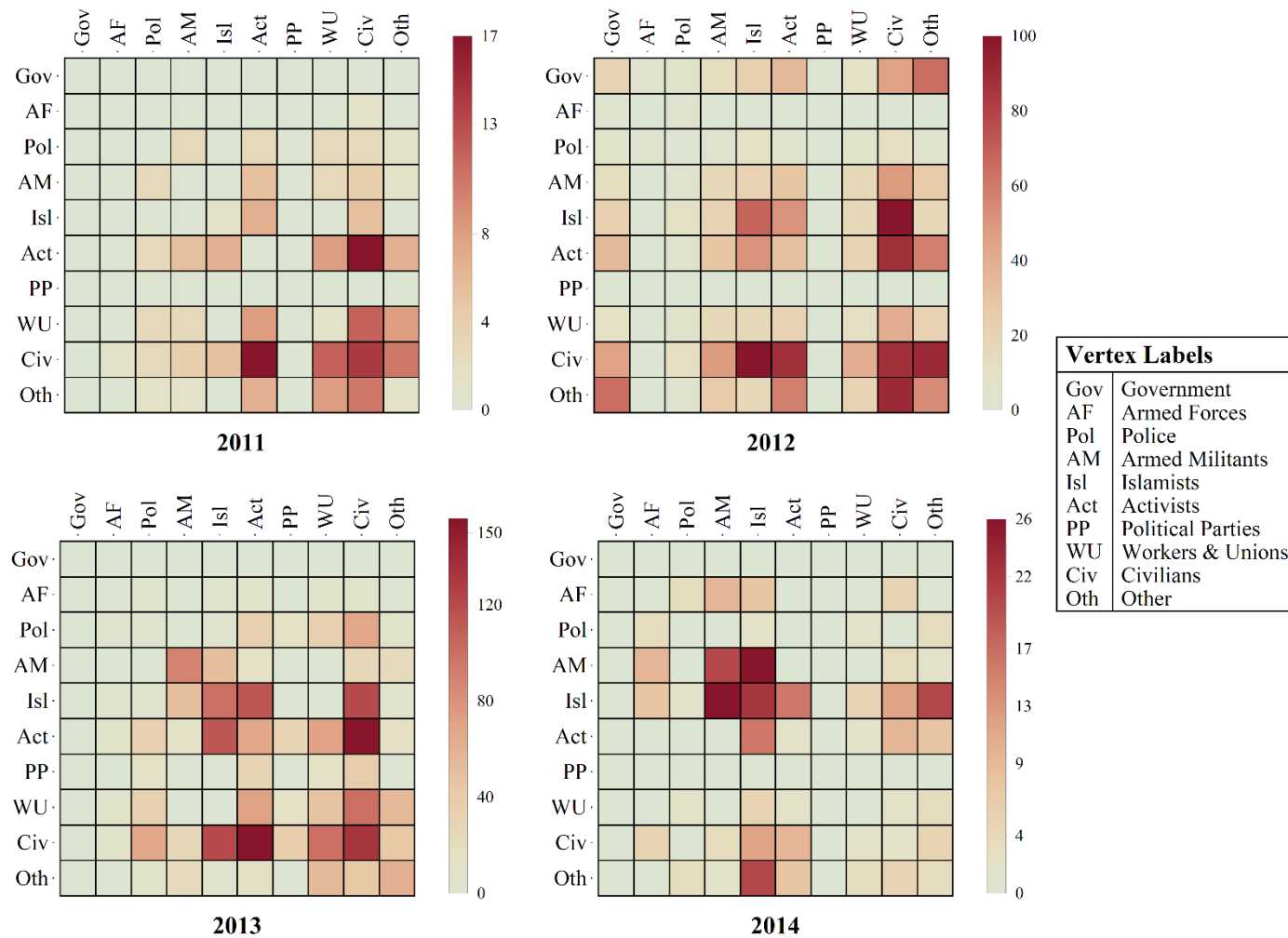
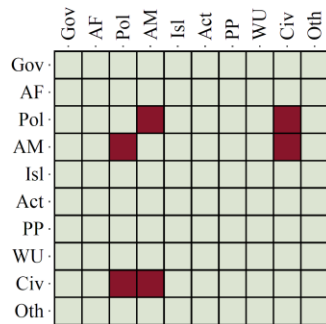
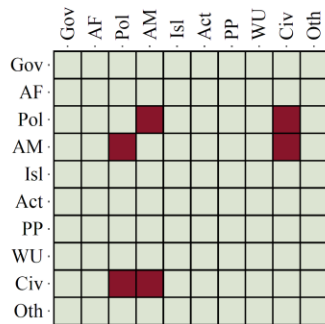


Figure A.9. Weighted adjacency matrices for joint action relations among categorized vertices surrounding both major campaigns, by year.

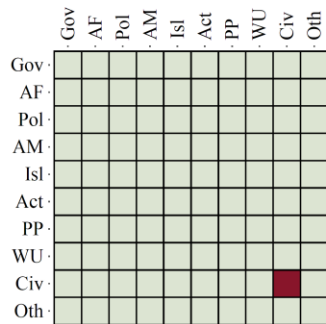
Figure A.10. Weighted adjacency matrices for joint action relations among categorized vertices surrounding the January 2011 campaign, by 3-week moving window (next page).



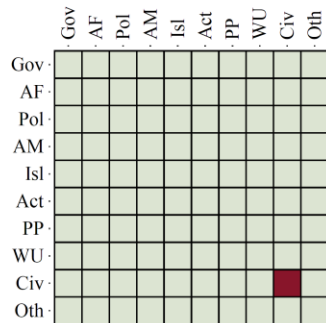
26 Dec 2010–15 Jan 2011



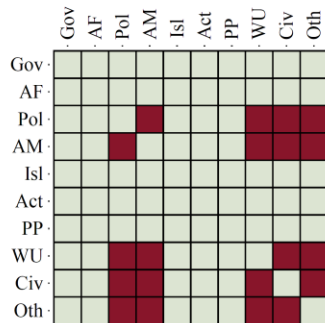
02 Jan 2011–22 Jan 2011



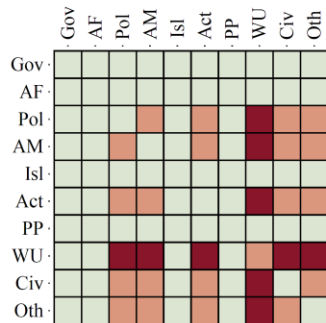
09 Jan 2011–29 Jan 2011



16 Jan 2011–05 Feb 2011

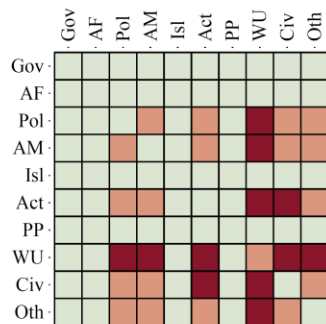


23 Jan 2011–12 Feb 2011

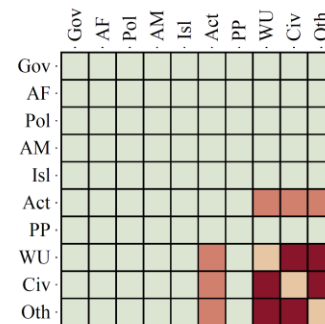


30 Jan 2011–19 Feb 2011

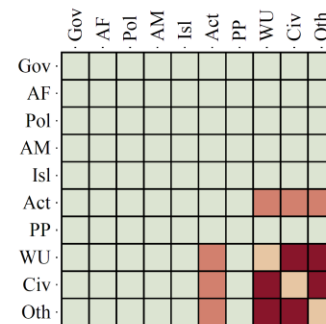
| Vertex Labels |                   |
|---------------|-------------------|
| Gov           | Government        |
| AF            | Armed Forces      |
| Pol           | Police            |
| AM            | Armed Militants   |
| Isl           | Islamists         |
| Act           | Activists         |
| PP            | Political Parties |
| WU            | Workers & Unions  |
| Civ           | Civilians         |
| Oth           | Other             |



06 Feb 2011–26 Feb 2011



13 Feb 2011–05 Mar 2011



20 Feb 2011–12 Mar 2011

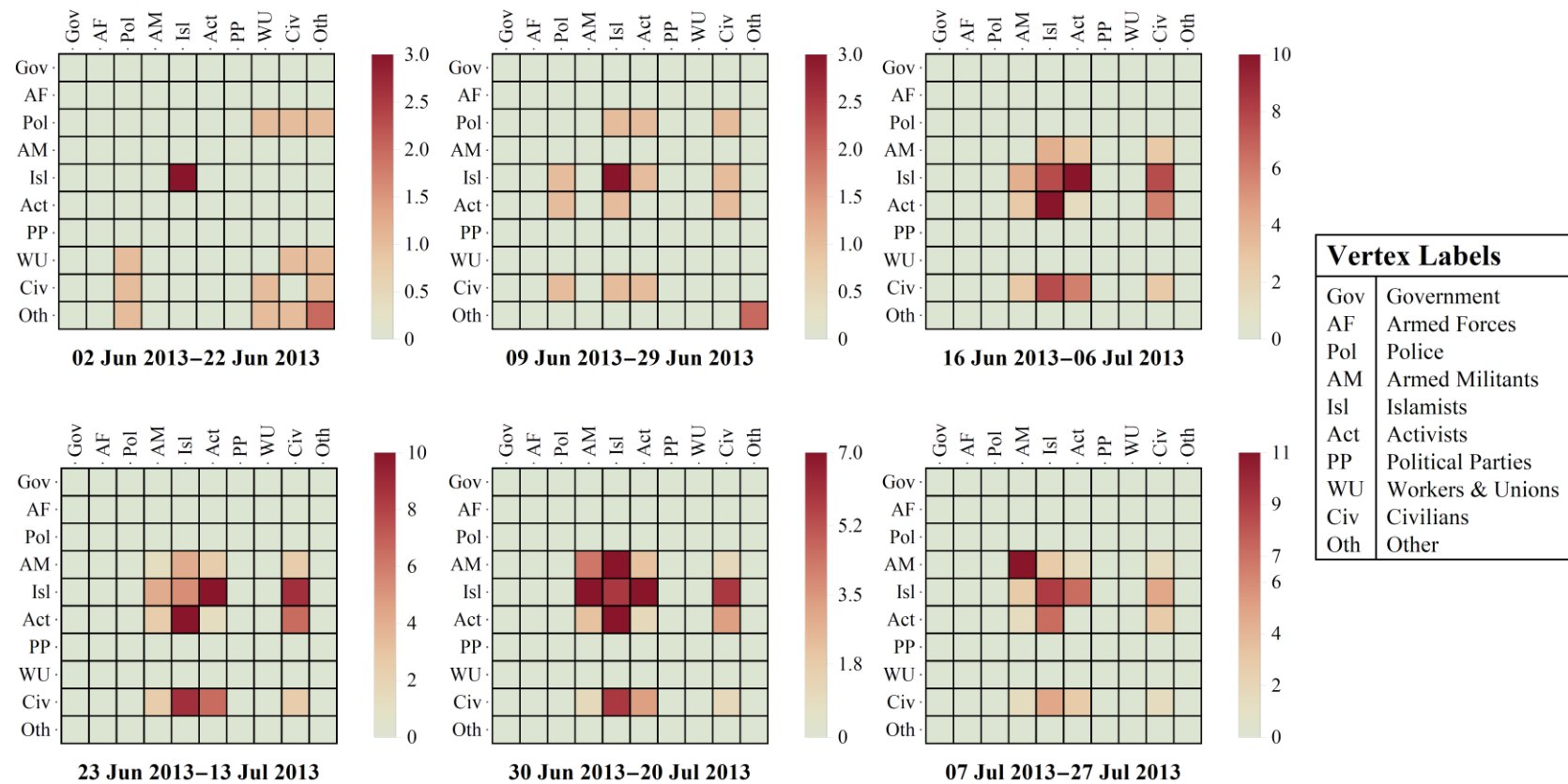


Figure A.11. Weighted adjacency matrices for joint action relations among categorized vertices surrounding the June 2013 campaign, by 3-week moving window.

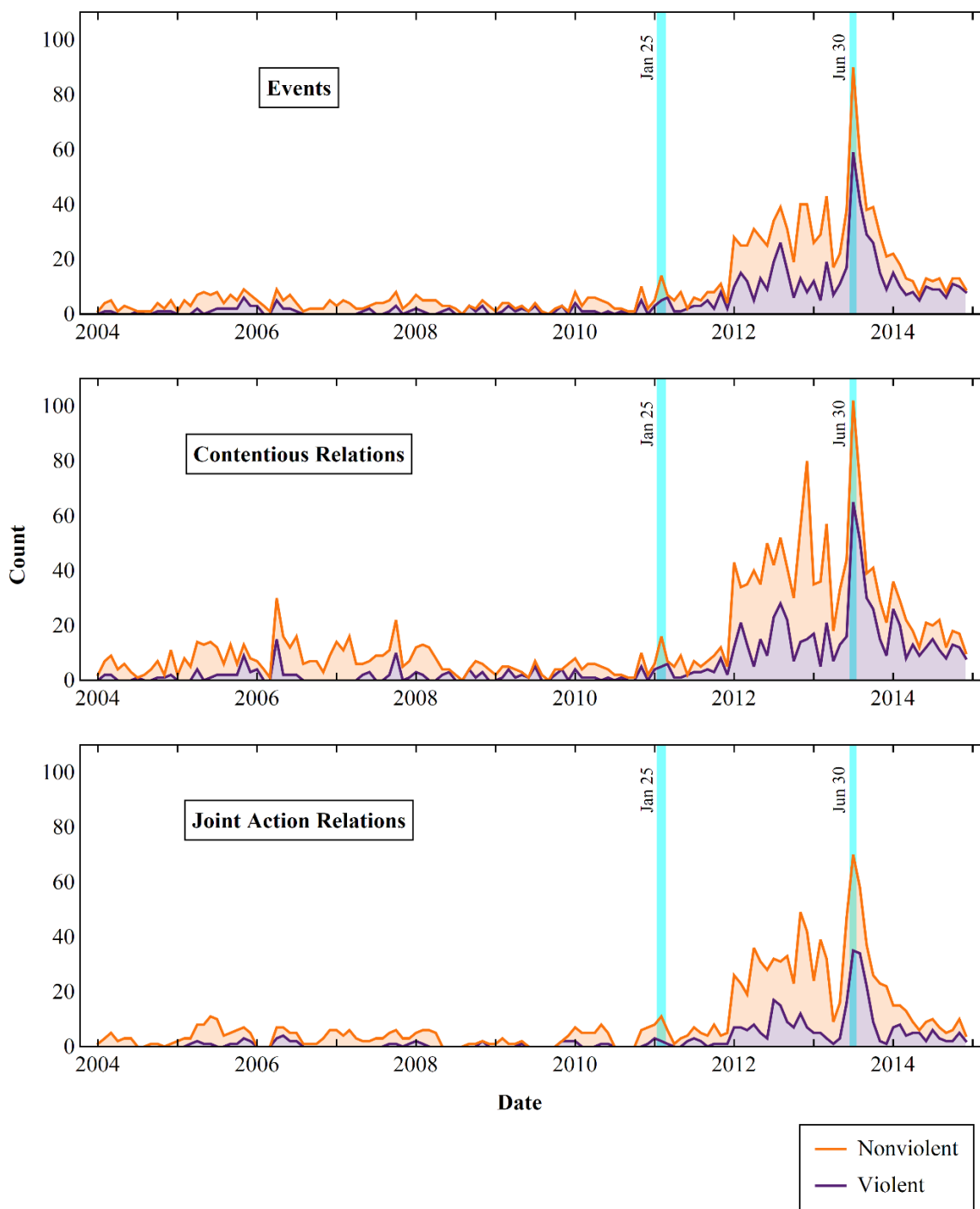


Figure A.12. Violent and nonviolent events and relations, by month.

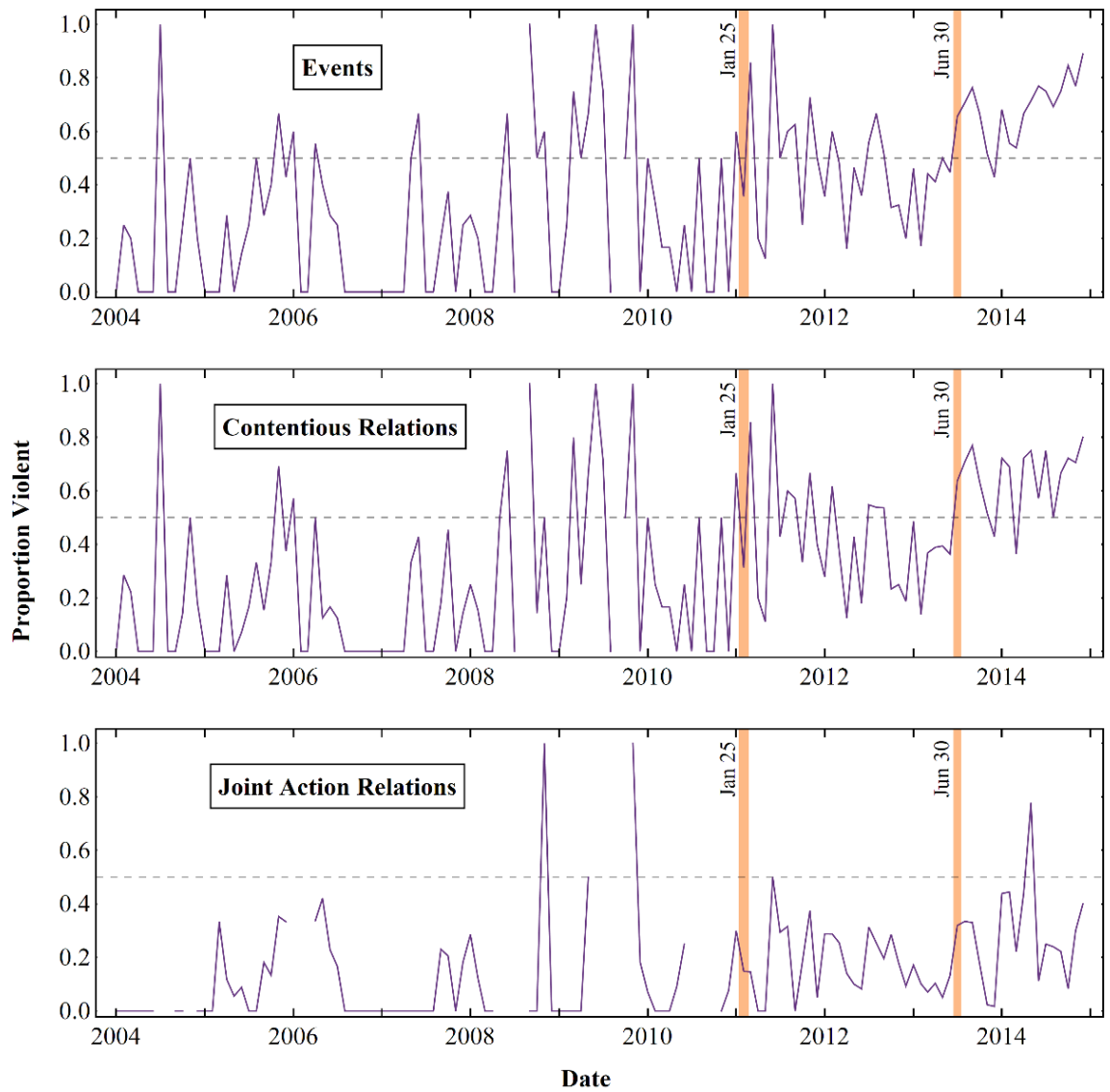


Figure A.13. Proportions of violent events and relations, by month.

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